

**T.C.
BAHÇEŞEHİR ÜNİVERSİTESİ**

**EXAMINATION OF THE CO-PRODUCTION
PROCESS IN SELF SERVICE
TECHNOLOGIES: LINKING CO-PRODUCTION
TO CO-CREATION OF VALUE**

PhD Thesis

BİRGÜL KÜPELİ

İSTANBUL, 2014

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**GRADUATE SCHOOL OF SOCIAL SCIENCES
BUSINESS ADMINISTRATION PhD PROGRAM**

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İSTANBUL, 2014

TEŞEKKÜR

Bu çalışmanın arkasında yer alan ve benden hiçbir zaman desteklerini eksik etmeyen çok özel insanlara teşekkürü bir borç bilirim. Öncelikle, bugün olduğum yerde olmamı sağlayan, her zaman yüreklendiren ve teşvik eden, kısaca beni bir bilim insanı olarak var eden, çok değerli hocam Prof. Dr. Selime Sezgin'e şükranlarımı sunarım.

Bu araştırmada danışmanlığımı yapan değerli hocalarım Yrd. Doç. Dr. Gülberk Gültekin Salman ve Doç. Dr. Elif Karaosmanoğlu'na tüm kalbimle minnetlerimi sunarım. Sizlerle birlikte çalışmak bir doktora öğrencisi için ancak hayal olabilir. Hayalimi şekillendirdiğiniz, beni her zaman ve her konuda desteklediğiniz, yerinde yaslanacak kaya, yerinde ağlayacak omuz olduğunuz için çok teşekkür ederim. Beni dünyanın en şanslı doktora öğrencisi yaptınız.

Bu çalışmanın ilk gününden itibaren kıymetli yorum ve önerileri ile beni yönlendiren tez izleme komitesi üyesi hocalarım Prof. Dr. Serdar Pirtini ve Doç. Dr. İpek Altınbaşak Farina ile, tez savunmam sırasında değerli yorumlarını benimle paylaşan hocalarım Prof. Dr. Elif Çepni ve Doç. Dr. Özgür Çengel'e şükranlarımı sunarım.

Sadece bir dönem birlikte olma ayrıcalığını yaşadığım, ancak bu kısacık dönemde bilimsel olarak bir gün ulaşmam gereken çıtayı belirleyen, kalbimde her zaman çok özel bir yeri olacak değerli hocam Prof. Dr. Gülden Asugman'a teşekkür ederim.

Son olarak, bu yolda benimle birlikte adım adım yürüyen, tüm zor günlerimde yanımda olan aileme teşekkür etmek isterim. Canım eşim Teoman Küpeli ve oğullarım Oğuz ve Cem Küpeli'nin sabır, anlayış ve desteği olmadan bu çalışma olamazdı. Sizlere her zaman minnettar olacağım.

Bu çalışmayı, maalesef sonucunu göremeden kaybettiğim babam Erdal Acar'a ithaf ediyorum. Bana bir amaç için nasıl çalışmam gerektiğini öğreten, sahip olduğum tüm değerleri şekillendiren, başarıma isteğini aşıl原因, kendime her zaman örnek alacağım ve ayak izlerini takip edeceğim çok özel insanı, canım babacığımı sevgi ve saygıyla anıyorum.

İstanbul, Haziran 2014

Birgül Küpeli

ABSTRACT

EXAMINATION OF THE CO-PRODUCTION PROCESS IN SELF SERVICE TECHNOLOGIES: LINKING CO-PRODUCTION TO CO-CREATION OF VALUE

Birgöl Kúpeli

PhD in Marketing

Thesis Supervisor: Asst. Prof. Gülberk Gültekin SALMAN
Thesis Co-supervisor: Assoc. Prof. Elif KARAOSMANOĐLU

June 2014, 346 Pages

This thesis is aimed to contribute to Service Dominant Logic by delineation of the co-production process through a comprehensive model. The model proposed and tested includes antecedent conditions that motivate the customer to engage in collaborative production. Through the research model proposed the evolvement of customer motivation to actual co-production behavior is examined. Furthermore, the relationship between co-production outputs and future engagement in co-production is articulated. Moreover, co-production outputs have been linked with customers' attitude towards engaging in co-creation of value with their co-production partners.

This research predominantly utilizes quantitative approach that is shaped through insights gained from preliminary qualitative phase. In order to test the model proposed, self-service technologies through the specific context of online check-in has been used. A cross-sectional survey with 1095 passengers who have used the online check-in system of a major Turkish airline make up the research sample. The data has been analyzed through various multivariate techniques in order to ensure validity and reliability of the findings.

The findings of the study indicate that several antecedent conditions that are related to the customer, company and service to be co-produced as well as situational factors ignite customer's motivation to co-produce. Customer motivation is translated to actual co-production behavior through Theory of Reasoned Action. Co-production satisfaction is realized through the mediating effect of various perceived values. Finally, co-production satisfaction not only breeds future intention to co-produce, but also impacts forming customer's attitude towards co-creation of value with the co-production partner.

Overall, this research delineates the complex process of co-production and its linkage to co-creation of value.

Keywords: Co-production, Co-creation of Value, Service Dominant Logic

ÖZET

SELF SERVİS TEKNOLOJİLERİNDE BİRLİKTE ÜRETİM SÜRECİNİN İNCELENMESİ: BİRLİKTE ÜRETİM İLE BİRLİKTE DEĞER YARATMAYI İLİŞKİLENDİRME

Birgöl Küpeli

PhD in Marketing

Tez Danışmanı: Yrd. Doç. Dr. Gülberk Gültekin Salman

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Haziran 2014, 346 Sayfa

Bu araştırma, Hizmet Egemen Mantık çerçevesinde öne sürülen birlikte üretim sürecinin bütünlük bir model çerçevesinde açıklanması amacını taşır. Bu doğrultuda önerilen ve test edilen model, müşterinin birlikte üretim süreci motivasyonunu oluşturan öncüller ile başlamaktadır. Araştırma modeli ile üretim motivasyonunun birlikte üretim davranışına dönüşümü incelemektedir. Ayrıca, birlikte üretim davranışının çıktısı olarak kuramlanan süreç memnuniyetinin, gelecekte birlikte üretime girme niyet ve birlikte değer yaratmaya karşı tutum üzerindeki etkisi araştırılmıştır.

Araştırma ağırlıklı olarak nicel araştırma yöntemlerine dayanmakla birlikte, araştırmanın erken safhalarında nitel araştırma yöntemlerinden faydalanılmıştır. Araştırma modelinin test edilmesi aşamasında kullanılan online check-in kapsamı, self servis teknolojilerinin yerleşmiş örneklerinden bir tanesi olarak kabul görmektedir.

Türkiye'nin önde gelen havayolu şirketlerinden bir tanesinin online check-in sistemini kullanan 1095 yolcu, araştırmanın örneklemini oluşturmaktadır. Örneklemden veri, kesit analizi anket yöntemi ile toplanmıştır. Araştırma çerçevesinde incelenen kuramların geçerlilik ve güvenilirlik analizleri çok boyutlu analiz yöntemi ile değerlendirildikten sonra yapısal eşitlik modellemesi ile kuramlar arasındaki ilişkiler test edilmiştir.

Araştırma sonuçları, müşteri, firma ve birlikte üretilen servise ait öncüller ile birlikte, durumsal faktörlerin müşterinin birlikte üretime girme motivasyonunu etkilediğine işaret etmektedir. Motivasyon, Düşünmüş Eylem Teorisi neticesinde birlikte üretim davranışına dönüşmektedir. Birlikte üretim davranışı, algılanan değerlerin aracılık etkisi üzerinden üretim tatminine etki etmektedir. Ayrıca araştırma sonuçları, birlikte üretim süreci tatmininin, gelecekte ortak üretime girme niyeti ve ortak üretime girilen firma ile birlikte değer yaratmaya karşı tutumun üzerindeki etkisini ortaya koymaktadır.

Anahtar Kelimeler: Birlikte Üretim, Birlikte Değer Yaratma, Hizmet Egemen Mantık

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ABBREVIATIONS

AGFI	: Adjusted goodness-of-fit index
AMA	: Alternative models approach
AMOS	: Analysis of moment structures
AVE	: Average variance extracted
ASV	: Average shared variance
BTS	: Bartlett test of sphericity
CE	: Customer equity
CFA	: Confirmatory factor analysis
CFI	: Comparative fit index
C/I	: Check-in
CLV	: Customer lifetime value
CMIN	: Chi-square
CMV	: Common method variance
CR	: Construct reliability
DV	: Dependent variable
EFA	: Exploratory factor analysis
FP	: Foundational premise
FPs	: Foundational premises
GDL	: Goods Dominant Logic
GFI	: Goodness-of-fit index

GOF	: Goodness-of-fit
IV	: Independent variable
KMO	: Kaiser-Mayer-Olkin measure of sampling adequacy
MCAR	: Missing completely at random
MGA	: Model generating approach
MSA	: Measure of sampling adequacy
MSV	: Maximum shared variance
NFI	: Normed fit index
p	: Page
pp	: Pages
RMSEA	: Root mean square error of approximation
SCA	: Strictly confirmatory approach
SCT	: Social Cognitive Theory
SEM	: Structural equation modelling
SDL	: Service Dominant Logic
SDT	: Self-determination Theory
SMC	: Squared multiple correlations
SPSS	: Statistical package for social sciences
SST	: Self-service technology
SSTs	: Self-service technologies
TAM	: Technology Acceptance Model
TLI	: Tucker-Lewis index

TR	: Technology readiness
TRI	: Technology readiness index
TRA	: Theory of Reasoned Action
TRI	: Technology Readiness Index
TT	: Theory of Trying
VE	: Variance extracted
VIF	: Variance inflation factor

SYMBOLS

Average variance extracted	: ρ_v
Chi-squared value representing likelihood ratio	: χ^2
Composite reliability	: ρ_c
Confidence interval	: c
Error term associated with an estimated measured variable	: ε
Error variance of the indicators	: Θ
Expectation of the i^{th} outcome	: b_i
Evaluation of the i^{th} outcome	: e_i
Fit function of a model that with no theoretical relationships	: F_0
Indicator loading	: λ
Indirect effect	: c'
Individual's intention to engage in that specific behavior	: BI
Individual's attitude toward engaging in that specific behavior	: A_B
Level of precision	: p
Minimum fit function of a SEM model using k degrees of freedom	: F_k
Motivation to comply with the j^{th} referent	: MC_j
Perceived expectation of the j^{th} referent	: NB_j
Regression coefficient from ξ to η	: γ
Relative weights given to components	: w_x

Specific behavior	: B
Squared loadings of the indicators	: λ^2
Squared multiple correlations of the j th indicator	: ρ_j^2
Sum of squared indicator loadings	: $(\sum \lambda)^2$
Sum of error variance of the indicators	: $\sum (\Theta)$
Subjective norm regarding that specific behavior	: SN
Total effect	: c
Z value for the determined confidence level	: Z

1. INTRODUCTION

Roughly a hundred years after the emergence of marketing science, a general theory of marketing that has the power to explain, predict and even some cases control its subject matter (Buzzell 1963), which still longs formal conceptualization, remains elusive. In such setting, Service Dominant Logic (SDL) introduced by Vargo and Lusch (2004a) embraces different doctrines argued by scholars of marketing and of related disciplines in order to develop a more holistic approach in explaining marketing phenomenon. SDL considers the concept of value to be the paramount of its central tenet (Grönroos 2008, Vargo and Lusch 2008a, Lusch and Vargo 2006, Vargo and Lusch 2004a) and argues that defining value(s) grants SDL to have exploratory power over the unit, direction, context and participants of exchange (Vargo et al. 2008a) and offers a unique perspective that attempts to explain marketing as an integrated process.

The concept of value has been the epicenter of marketing thought starting with the turn of the twentieth century (Weld 1916, Shaw 1912). Yet, defining where the real value lies and who determines it have caused much controversy. SDL, conceptualized through originally eight (Vargo and Lusch 2004a), respectively ten foundational premises (FPs) (Vargo and Lusch 2008a) argues that value is the epicenter of all social and economic exchange, which is “uniquely and phenomenologically determined by the beneficiary” (Vargo and Lusch 2008a, p. 7), which literature labels as co-creation of value. Co-creation refers to mutual efforts of the company and customer *after* point of exchange, to extract and consume value from the offering. This view inherently suggests, customer and company do not part ways after point of exchange, but work towards creating value-in-use in customer’s sphere, as the customer incorporates the offering to his/her life (Grönroos 2011, Grönroos 2008). As important as it is to articulate the process of co-creation of value within, it is even more important to understand the prerequisite conditions that lead to co-creation of value. This is basically the quest for understanding the reasons, why the customers would invite the companies to their own sphere to act as value facilitators in the process of value extraction and consumption.

One of the determinants of value co-creation is argued to be the mutual efforts of the parties in production stage for creating value, namely value-in-production. Vargo and Lusch (2009, p. 230) assert co-production is “an optional subset of the non-optional value co-creation”. Co-production refers to mutual commitment of resources in production stage to create an offering that fits better with the unique needs of each party (Grönroos 2006). The end-result of co-production process is not only the products or the services that are cooperatively produced, but also interaction that guides the customer and company to advance to creation of value-in-exchange and value-in-use (Payne et al. 2008).

Despite the growing interest in value-in-use and value-in-production, as well as the interplay between them, the empirical justification for the proposed conceptual reasoning has been absent. Besides the descriptive model of co-production proposed by Etgar (2008), there have been no empirical studies that have investigated the *process of co-production*. Furthermore, although the link between co-production and co-creation has been philosophically suggested, supporting literature demonstrating the bond is non-existent.

This study is designed to contribute to marketing literature through delineation of co-production process. Its scope covers articulation of the process of co-production from customers’ perspective. In doing so, it regards the customer, the company and the offering to be co-produced as the essential legs of the trivet and works towards developing an understanding of the prerequisites that motivate the customers to engage in co-production. Furthermore, the delineation of how the customers advance throughout the process, as well as the ways to establish a link between consequences of co-production and value co-creation are aspired.

1.1 AIM OF THE RESEARCH

This study recognizes that three distinct, yet linked, stages constitute value creation process. Value creation process starts with creation of value in production, advances to realization of value in exchange and continues with value co-creation and emergence of consequences of value-in-use.

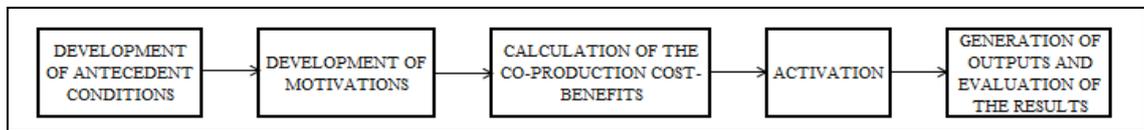
It is argued that each stage in itself creates value as previously discussed throughout marketing literature. To name a few examples of value created by each distinct stage; value created through sole production activities is discussed under the rubric of customization, value created through sole exchange activities is discussed under the rubric of price discounts, and value created through sole use activities is discussed under the rubric of customer relationship management. However, this study further asserts that it can only be interpreted as a process if the distinct stages can be meaningfully linked to each other.

Etgar (2008, p. 97) argues production and consumption are nested concepts and “consumption activities are not separate form production activities, but connected to them”. Therefore, the first aim of this study is to investigate the link between value in production and value co-creation. Consequently, it purports that since the value created in production is processor of value created in use, it explores the connection between consequences of co-production to co-creation of value.

Etgar (2008) argues that co-production is a dynamic process encompassing several distinct stages. However, co-production literature offers limited conceptual guidance on the alleged dynamic process, leaving room for further investigation. Therefore, the second aim of this study is to investigate different stages of co-production process to reveal the true nature of value realized through collaboration in production. In doing so, it adopts the general guidelines provided by Etgar’s descriptive model (2008) presented in Figure 1.1. The descriptive model is converted into a theoretical model utilizing well established theories and constructs that are derived from thorough literature review. Finally, marketing literature witnesses scattered empirical findings of co-production that investigate different snapshots of the process looking from a single perspective at time. Previous empirical findings mainly concentrate on a specific aspect of co-production through isolated incidents, utilizing limited constructs from marketing literature in order to investigate relationships on a limited scale, rather than trying to paint a holistic picture of the whole process. Therefore, the final of aim of this study is to delineate the antecedents and consequences of co-production process taking variety of factors into consideration to produce an integrated perspective that will present a model of co-production process as a whole. In doing so, this study adopts customers’ perspective,

looking through the lens of customers and trying to tap into their perceptions of co-production process.

Figure 1.1 Descriptive model of the co-production process



Source: Adopted from Michael Etgar., 2008. A descriptive model of consumer co-production process. *Journal of Academy of Marketing Science*, **36** (1), pp. 97-108.

1.2 RESEARCH QUESTIONS

The main research question of this study is:

What is the relationship between co-production consequences, which emerge through the co-production process, and attitude towards co-creation of value?

This study is intended to address below listed questions to contribute to marketing literature.

- a. What is the co-production process?
- b. What stages does the co-production process consist of?
- c. Which factors effect each stage of the co-production process?
- d. What process do the customers go through in order to realize value in co-production? What sort of value(s) is realized as a consequence of co-production process?
- e. Is it possible to create a future intention to co-produce through successful episodes of co-production processes?
- f. What is the linkage between co-production consequences and consumer's attitude toward advancing to co-creation of value with his/her production partner?

It is argued that by answering successfully to above research questions, this study will be able to provide strategic guidance and direction to companies which wish to engage in co-production process. The findings of this study will yield the customers' perceptions on inputs required to realize co-production, as well as their decision making process, value expectations and attitudes towards future engagement to possibly increase their life time value to their partnering companies.

Furthermore, providing and empirically testing an integrative framework of co-production will lead to delineation of sequential processes. The findings of this study will provide basis for investigation for the process of value-in-exchange and value-in-use. The successful investigation of all three processes will constitute the fundamental value creation within marketing as an integrated process.

1.3 METHODOLOGY AND METHODS USED

In order to develop and empirically support the research model proposed different methods of research was utilized in different stages of this research. This section summarizes various methods used throughout the research process.

This research is aimed to understand the process of co-production and its link to co-creation of value in self-service technologies context from the customer's lense. As it is advised in under-researched areas of interest, this research commences with exploratory phase (Dacin and Brown 2002). Before advancing to the quantitative study, it explores the variables of interest and its relation to co-production and co-creation literature through in-depth interviews and focus groups. The insight gained from this phase is used to enhance the researcher's understanding of the phenomenon. The exploratory phase guides the path to quantitative phase of the study by helping researcher to critically assess the important factors that need to be considered regarding the process proposed. As suggested by Deshpande (1983), qualitative phase is used to increase the validity of the findings, to second the research model proposed, and to give the researcher opportunity to critically discuss the findings.

For the reasons stated above, during initial stage of this research, semi-structured in-depth interviews with company executives and focus groups with customers were used. The in-depth interviews mainly concentrated on the ways company would be able to

contribute to the process that was sought to be delineated, and the focus groups were utilized to understand factors of engagement, development throughout the process and outcomes of collaborative production from customers' perspective. Furthermore, information collected through exploratory phase was put to use for researcher-generated scales, as well as validation for the adapted scales. Once, the scales were assessed by academic judges to ensure content validity (De Vellis 1991), the quantitative phase of the study commenced with the pilot test.

Due to the descriptive nature of the research, this study predominantly adopted quantitative approach, thus survey method (Churchill 1979). A pilot test was conducted to ensure operative indicators were being used for the main study. This is an important to step in quantitative research as it is argued to increase the validity and reliability of the findings (Churchill 1979). As advised by Hair et al. (2006) exploratory factor analysis and Cronbach alpha statistic was carried out to purify the survey instrument.

Through the main study phase, a cross-sectional survey was utilized to fully explore the causal relationships proposed through the research model. The analysis was carried out in a vigorous approach through exploratory factor analysis of the main data once again, followed by reliability checks. Finally the assessment of the data was concluded with measurement model and structural model testing (Tabashnick and Fidell 2007, Hair et al. 2006). In this final stage, as advised by Anderson and Gerbing (1988), testing of the structural model to establish causal links among constructs started only after unidimensionality of the constructs were established through confirmatory factor analysis.

For the analysis described above, Nvivo 10 Qualitative Data Analysis Software Program (Nvivo 10) –for the assessment of qualitative data, Statistical Package for Social Sciences (SPSS) software, version 16 –for the assessment of descriptive statistics, exploratory factor analysis, reliability statistics, analysis of multivariate assumptions, and Analysis of MOment Structures (AMOS), version 16 –for the assessment of confirmatory factor analysis and structural model testing, were used.

1.4 OUTLINE OF THE STUDY

This research consists of seven sections. In the first section, the basic idea behind the research inquiry has been introduced. The aim of the research as well as the research questions of the study are delineated. Methodology and methods used through the study have been briefly presented.

Section two consists of literature review on value and establishes its importance with regard to the research inquiry. Furthermore, background information on basic concepts of Service Dominant Logic, various resources as well as theoretical frameworks utilized are introduced.

Literature review is followed by section three, which presents the conceptual framework of this research. Through conceptual framework, the constructs of the study is operationalized, various causal links among them have been established and hypotheses of the study are formed.

The fourth section of the research elaborates the methodology and methods used throughout the research. Various data analysis techniques and the ways they were utilized have been presented. This section also consists of preliminary findings that lead to simplification of the scales used before moving on to the main study.

The analysis and findings of the main survey are presented in the fifth section. This section consists of sample characteristics, means of validating the scales used, as well as the results of the structural model testing.

The discussion on the findings, which were detailed in section five, constitute the sixth section of the study. While the findings are being discussed, the literature review that have been presented in section three play a crucial role to comprehend the findings' position in marketing literature.

The final section of the study explains how this research have contributed to existing body of the knowledge looking from theoretical as well as managerial perspectives. Furthermore, the limitations of the study have been presented in the final section. The research is concluded with future research avenues suggested by the researcher.

2. LITERATURE REVIEW

The strength of Service Dominant Logic (SDL) stems from its encompassing nature. Many marketing scholars consider SDL to be a re-formulization, rather than a revolution (Wooliscroft 2008, Hunt and Madhavaram 2006, Kalaignanam and Varadarajan 2006). Yet, its boundaries, limitations and extensions are still unknown. Furthermore, SDL as the “general theory candidate” (Bolton 2006, Vargo and Lusch 2006, Vargo and Lusch 2004a, Vargo and Lusch 2004b) lacks “a theoretical model, operationalized constructs, and theoretical relationships between the constructs” (Randall 2007, p. 6). Moreover, marketing literature’s support for SDL struggles to go beyond faith without empirical evidence. Although scholars, in theory, agree SDL to be the new frontier that bears the promise to advance marketing science (Lusch and Vargo 2006), indigence of empirical findings makes SDL an immature area of study within marketing literature.

The aim of this study, in general, is to contribute to generation of knowledge using the roadmap stemming from SDL. As SDL regards value as the epicenter of the phenomenon to be explained, this work puts emphasis on the changing and incremental role of value through marketing thought. The changing meaning and function of value tracked through time enables a thorough understanding of the alleged paradigm shift in marketing, from Goods Dominant Logic (GDL) to SDL (Xie et al. 2008, Etgar 2006, Grönroos 2006, Gummesson 2006, Hunt and Madhavaram 2006, Lusch and Vargo 2006, Prahalad 2004, Vargo and Lusch 2004a, Vargo and Lusch 2004b). Delineation of the transition and the detailing of the qualities of SDL breed a theoretical model.

This section investigates the domain of the constructs used throughout this research in order to conceptualize a framework that can be further investigated through different methods. First, the concept of value is followed through marketing thought and its role in shaping SDL is reviewed. Next, the domain for co-production and co-creation of value is elaborated to establish linkages in the proposed research model that will be introduced in chapter three.

2.1 VALUE

Roughly a hundred years after the emergence of marketing science, a general theory of marketing that has the power to explain, predict and even some cases control its subject matter (Buzzell 1963), which still longs formal conceptualization, remains elusive. In such setting, SDL introduced by Vargo and Lusch (2004a) embraces different doctrines argued by scholars of marketing and of related disciplines over the past century, in quest for formulizing marketing's focal point and its entourage. SDL, argued to be the new frontier on the endeavor of the general theory of marketing science (Lusch and Vargo 2006), exploits major contributions to date in order to develop a more holistic approach in explaining the marketing phenomenon. In doing so, SDL considers the concept of value as its central tenet. SDL argues "what is exchange?" and "what is being exchanged?" can only be investigated through true conceptualization of value(s), which is regarded to be the origin point towards conceptualization of marketing theory (Lusch and Vargo 2006). Furthermore, it provides solid grounds and a unique perspective that regards and attempts to explain marketing as an integrated process.

The discussion on value falls under three distinct perspectives that treat value rather differently. First is the perspective of economics that regards value under the rubric of "utility" (Bastiat 1848, Mill 1848, Say 1821, Smith 1776/1994). Value in economics plays a subordinate role and suffers from economics' own struggles to become a natural science. Second is the GDL perspective that breeds with marketing's emancipation from economics. In GDL, value is studied under the rubric of "exchange", which is regarded to be the focal point of marketing (Houston and Gassenheimer 1987, Hunt 1983, Bagozzi 1979, Bagozzi 1975, Alderson 1965). GDL stands for a complete century, starting as a narrow path that originate from strict doctrines of economics, taking the notion of exchange in the most literal sense possible, to a broader approach that regards exchange as a social process functioning under economic and psychological constraints (Bagozzi 1979) in order to create experiences. Third is the SDL perspective that regards value as *the* phenomenon to be explained rather than a surrogate or a rubric of any sort. SDL emphasizes the importance of value created in consumption over value realized in the market place. Consequently, defining value grants SDL to have exploratory power

over the unit, direction, context, and participants of exchange for the very first time (Vargo et al. 2008).

Next sections are designed to explain the flow of value through the discussed perspectives.

2.1.1 Value in Economics

The roots of value rest on early work of Plato's *The Republic* (360 B.C.E./1930), in which he makes the distinction between intrinsic and extrinsic value. According to Plato, intrinsic value presents itself in the form of the goodness in itself as opposed to extrinsic value, goodness in achieving something else (Ng and Smith 2012). Later in 1867, Marx(1867/2001) further articulates the two kinds of value as he argues that the value of the object does not only lie in its purposefulness but also in the value of its context, which can only be realized in consumption. Literature notes Plato's contributions to be the earliest definitions of value-in-use (Ng and Smith 2012).

The well-accepted "father of economics", Smith (1776/1994) articulates the dominant views into four major streams, each detailing value from a different perspective (Vargo et al. 2006, Vargo and Morgan 2005).

- i. The Aristotelian view of social virtue describing the subject's contributions to the well-being of the society through service;
- ii. The mercantilist view favoring surplus of tangible commodities which, then, could be exchanged for precious metals;
- iii. The physiocratic view regarding agriculture as the only activity that created value;
- iv. The philosophy regarding the laws of nature as the paramount of explanation, contemplating social exchange to be an extension of natural laws, where Newtonian mechanics served as "model of mastery" (Vargo et al. 2006, p. 30).

Smith (1776/1994, pp. 30-31) explicitly defined "real value" as the labor required to afford "necessities, conveniences and amusements of human life" supplied by the labors of others, meaning he was more interested in quantities of labor rather than quantities of

things (Vargo et al. 2006). Quite paradoxically, Smith (1776/1994) favoring labor, a possible working definition of service over tangibles, concentrated his work on nominal value instead, an alias for value-in-exchange. Although Smith's (1776/1994) model of normative economics, that explains creation of national wealth, articulates nominal value, his work is accepted as an important contribution to the conceptualization of meaning and flow of value in SDL.

Following Smith (1776/1994), Bastiat (1848), Mill (1848), and Say (1821) concentrated on production, yet not as the source of creation of matter but of utility. With fine distinctions, they argued value of production was not presented in objects *per se* but in utilities and benefits they rendered. Rather than defining the intention of labor in terms of creation of things, they defined it as deeds that would provide satisfaction, establishing a monumental step towards works of services marketing literature as early as 19th century. Although, the utility described by Bastiat (1848), Mill (1848) and Say (1821) resembles Shostack's (1977, p. 74) widely cited quote as she argues for the grounds of a new conceptual framework with:

One unorthodox possibility can be drawn from direct observation of the nature of market "satisfiers" available to it.... How should the automobile be defined? Is General Motors marketing a service, a service that happens to include a by-product called a car? Levitt's classic "Marketing Myopia" exhorts businessmen to think exactly this generic way about what they market. Are automobiles "tangible services"?

they, quite similarly to Smith (1776/1994), move away from investing in the notion of value-in-use and further invest in value-in-exchange. There are two main reasons for such divergence.

First, the concept of utility could only be viewed as a primary unit of analysis in economics if it was embedded in the property of matter (Vargo et al. 2006). Such reasoning indicated that although the dominant view dictated the importance of utility over matter, utility could only exist within matter, and it could never be exclusive of it. This point of view directs the reader to GDL that will be articulated in the following sections of this study.

Second reason for the divergence was the struggle to certify the scientific status of economics in the second half of the nineteenth century. Philosophy of economics, trying

to emancipate itself, in order to be acknowledged as a natural science, was in need of complying with Newtonian tradition. Newtonian tradition stood for the strict rules that bred laws such as Newton's laws of motion, also known as Newtonian mechanics, that consisted "exclusively of observable phenomena and logical relationships between them" (Eidlin 2013, p. 3). During such transition, economics struggled with indistinct characteristics of services and utilities that could neither be defined nor be reified. The salvation, which would raise the status of economics to "pure sciences" level came in the form of hypothetical "homo economicus" (Vargo et al. 2006). The economic men fitted the rigidly shaped boxes of positivism, once again, utility was in the rise, yet this time strictly synonymized with profit maximization pointing to direction of value-in-exchange assuring requisite grounds of GDL (Vargo et al. 2006).

2.1.2 Value in Goods-Dominant Logic

One of the main arguments of this study is the notion that SDL is not a revolution, but a re-formulization of theories of marketing into a body of knowledge that has the power to explain its subject matter. In order to argue this position, the precise illustration of the theories of GDL that paved the way to SDL is of utmost importance.

Declaration of independence came at a cost to marketing in the form of a struggle to delineate its nature and scope. Marketing's emancipation from economics with the turn of the twentieth century brought about a very important question that stemmed from issues related to production efficiency and distribution (Vargo and Morgan 2005); "if manufacturing created (embedded) value that could be exchanged in the market, did marketing contribute to value creation and, if so, how?" (Vargo 2007, p. 55).

The first scholar ever to coin the term value, in the boundaries of marketing discipline, was Shaw (1912). According to Shaw (1912), marketing contributed to "form" utility through manufacturing and "place" utility through distribution. Literature marks the first half of the twentieth century as a constant struggle to make sense of the concepts of utility and value in terms of exchange that mainly concentrated on agricultural products and commodities, alternatively, named as goods (Copeland 1923, Weld 1916, Shaw 1912). In short, Shaw (1912, p. 12) argued that marketing was simply applying "motion to matter" to change its form through production and to change its place through

distribution. Subsequently, the main focus of early scholars of marketing was commodity, functional, institutional, and regional schools of thought (Sheth et al. 1988). Marketing tried to answer “what”, “where” and “who” questions of marketing in an *outcome* oriented way. In doing so, the main idea was simple: produce and distribute to sell. The efficiency in production and distribution meant profit maximization which was achieved through standardization and economies of scale. Therefore, the *real* value was created through production efficiency: hence the term; value-in-production (Vargo and Lusch 2009).

The years of depression and the years of prosperity that followed had an immense impact on marketing thought. Although the discussion of utility remained as important in the environment of high production, demand, and competition, the notion “exchange” stole the limelight. The main point of interest shifted from asocial economic models to normative exchange techniques that would create economic return in an *action* oriented way; mainly through managerial and functionalist schools of thought (Sheth et al. 1988) answering the “how” question of marketing. Alderson (1965, 1957), unarguably, one of the major contributors of exchange theory, acknowledged and often used the term utility, but openly argued against simplistic and idealistic doctrines adopted from economics. He believed that such theories were inadequate in explaining the complex nature of markets. Widely known for his contribution through Law of Exchange, Alderson (1965) argued the importance of increasing potency through exchange, delineating transactions and transvections (Alderson and Martin 1965). Alderson’s (1957, p. 69) point of view on exchange was not limited to discrete transactions as he argued “What is needed is not an interpretation of the utility created by marketing, but a marketing interpretation of the whole process of creating utility”.

Previously defined as “transfer of ownership of goods and their physical distribution” (Lusch et al. 2007, p. 6), marketing cherished the normative prescriptions of managerial and functionalist schools of thought, which dictated that fundamental tenet of marketing function was utility maximization through predetermined value embedment. The major difference between two eras was that, the latter realized that there was a constant struggle over patronage of households in the marketplace not only to develop but also maintain and increase comparative advantage. Therefore, each firm could only

survive if the buyers constantly had a reason to prefer firm's outputs over the competitors. Therefore, quite opposite to the economic theories utilized in earlier decades, firms realized they needed to acquire new resources to generate heterogeneous supply. Subsequently, heterogeneous demand and heterogeneous supply would be matched by intermediaries in the marketplace (Alderson 1965, Alderson 1957). In short, firms who struggled to survive in the marketplace realized the importance of resources to create what they believed would be considered as value by the customers. Their main goal was to decide on the value that they would provide and then, embed the decided value on to goods in order to be distributed through intermediaries. Eventually, the added value would present itself through market price and the customers would realize the added value in the marketplace during the exchange process; hence, the term value-in-exchange was born.

Major shifts in the second half of the twentieth century challenged this company oriented and market centric view. First, the rise of consumer behavior and social exchange schools of thought minimized the gaps between parties in marketplace (Lusch et al. 2007, Vargo 2007). Second, the advancements in services marketing starting with "Scurrying About" and continuing with "Walking Erect" era (Fisk et al. 1993, p. 63) shed light on the indispensable role of services within marketing thought. Third, American Marketing Association's commitment through four services marketing conferences (1981, 1982, 1983 and 1985) in just five years evoked marketing scholars' and practitioners' attention alike. Fourth, advancement in information technologies bred a new type of empowered, active, connected, and erudite customers (Prahalad and Ramaswamy 2004a). Finally, resources that were seen as a source of competitive advantage, which is a primary element of SDL, were operationalized for the very first time by Constantin and Lusch (1994). Consequently, marketing started to seek the answer to question "why" for the very first time in an *experience* oriented way.

Two points are noteworthy before advancing to delineation of SDL and its premises. It was only after the third era when marketing scholars could answer the why questions of exchange. As important as it is to answer the what, the where, the when, and the how questions to any science, Whetten (1989) argues that theories are built on why questions. It was through thorough investigation on consumers' behaviors that led

scholars to whys. Such decomposition evoked major streams in marketing such as relationship marketing. Secondly, a leading marketing scholar, Bagozzi (1979, p. 138) defined exchange in the most encompassing nature that grasped the true nature of SDL as he argued exchange was “transfer of something tangible or intangible, actual or symbolic, between two or more social actors” that can be explained in terms of *outcomes*, *actions* and *experiences*. This definition was the first marketing definition that had the power to comprise all three eras discussed above.

2.1.3 Value in Service-Dominant Logic

The five distinct shifts discussed in the earlier section underlined the changing nature of consumer, the importance of services and the irrevocable role of different resources that all parties had in the market place. Through these shifts companies realized that, integrating customers’ resources to production processes was an important piece in the puzzle of creating competitive advantage (Madhavaram and Hunt 2008, Vargo and Lusch 2006, Vargo and Lusch 2004a). Relying on the definition and distinction made earlier by Constantin and Lusch (1994) operand resources came into prominence. The differentiation made between operand and operant resources is noteworthy.

Operand resources are defined in terms of all resources that needs to be employed an act upon to produce any kind of effect (Constantin and Lusch 1994). Raw materials, natural resources, land and capital are several exemplars of operand resources. As precious as they are, operand resources are unable to produce an effect in their natural state. On the other hand, operant resources are the dynamic, intangible and invisible resources that produce differential effects when employed on operand resources (Vargo and Lusch 2004a). Mental competencies, skills, and knowledge are important exemplars of operant resources. Operant resources are those that bring operand resources to life to produce the final effects that are needed to create differential advantage (Vargo and Lusch 2004a, Vargo and Lusch 2004b). As the examples of operant resources suggest, the sole source of operant resources is humans (Madhavaram and Hunt 2008). Therefore, regardless of the unique importance of each resource in itself, the crucial point is “resources are *not*, they *become*” (emphasis on the original) (Zimmerman 1951, p. 2), and how they *become* is through the utilization of operant resources on to any resource known to men. In doing so, not only the operant resources of the company but all the

resources that have a place in the value chain become crucial. Therefore, the value chain becomes “sequential bundles of operational activities linked in a network chain” (Etgar 2008, p. 98), in which all parties invest their resources to create value constituting an “activity network chain” (Etgar 2008, p. 98). This point suggests for the very first time, an important step towards recognizing marketing as a process rather than discrete transactions or exchanges. The aforementioned marketing process suggests a chain in which parties congregate with their resources to create value for all investing parties, and possibly the society at large (Lusch and Vargo 2006). Before advancing to delineation of value creation process, foundational premises (FPs) of SDL, which paved the way, are noteworthy.

Ever since the publication of the article by Vargo and Lusch (2004a), “Evolving to a New Dominant Logic for Marketing”, which is regarded to be ground zero for SDL, marketing literature has paid a great deal of attention to concept of co-production.

Although the concept of co-production became prominent with the introduction of SDL in 2004, companies’ interest in collaborative production dates many decades back. Bendapudi and Leone (2003) assert, in 1930s supermarkets were using customers in selecting, carting and transporting goods. As early as 1979, Lovelock and Young were discussing consequences of customer participation in production (Lovelock and Young 1979). However, the distinction begins when we consider the reason why the concept of co-production was important to marketing.

Under the influence of GDL, co-production was seen as a new and improved way of collaboration that would increase the productivity of the producer or the service system. Heavily influenced by Resource-Advantage Theory (Hunt and Morgan 1995) and looking through firms’ perspective, it was seen as an opportunity to make use of customer resources to lower production costs by freeing up labor, and decreasing company resource investment (Mills and Morris 1986) as well as creating higher exit barriers for customers who have invested in the making of the product (Barnes 1994). As the company increased its productivity, it would have the ability to have offerings for a lower price in the market (Bendapudi and Leone 2003), suggesting in the direction of creating value in exchange once again. Therefore, the argued collaboration in production within this perspective is initiated and orchestrated by the company and is

limited to using customer resources as substitutes to those of firms. Nevertheless, several changes in the marketplace altered the argued course of co-production (Prahalad and Ramaswamy 2004a).

The tremendous advancement in technology had massive impact on the roles of all parties in the marketplace. Such changes bred a new type of consumer that was more knowledgeable, connective and active (Prahalad and Ramaswamy 2004a), who demanded much more than the role pre-cut for them. They were no longer willing to invest their scarce resources for the value realized in marketplace through price. They demanded offerings that fit better with each of their unique needs (Badaracco 1991, Christopher et al. 1991). This period, also known as the rise of customization, resulted in increasingly heterogeneous demand in the marketplace (Gilmore and Pine 1997). Companies were quick to pick-up on customization, regarding it as the new frontier in competitive advantage (Gilmore and Pine 2000, Varki and Rust 1998). As the continuous advancement in technology decreased the cost of customization, increasing number of companies and customers became closer in marketplace to create customized offerings. Such proximity not only meant for customers to invest their resources in the process of production but also literally to become a part of the production process itself. As for companies it meant, they could no longer act as production companies, but they also had to serve as service companies, since they were in such close contact with their customers (Payne et al. 2008).

Concurrently, the advancements during 1980s and 1990s on services marketing, mainly due to deregulation of services (Fisk et al. 1993), bred a new line of practices within marketing. As service companies specialized in marketing of service offerings, such practices were also put into use by production companies that were closer to their customers than ever before forcing them to realize no company could ever escape being a service company. Badaracco (1991), as well as Dabholkar (1990) were among the first scholars to articulate the perceived service quality's impact on successful co-production episodes. However, a common misconception in marketing literature between the usage of terms service and services is worth mentioning.

The concept of services is a concept stemming from GDL. Services basically represent units of output, just like goods, which are basically in intangible form. Service on the

other hand represents a reoriented philosophy that argues all companies are basically in business to serve their customers. Whether they are in one end of the goods-services continuum, producers of pure goods, or they are in the other end with pure services offerings, they all must act as service companies because service is the base unit of all social and economic exchange (Vargo and Lusch 2008a, Vargo et al. 2008, Vargo and Lusch 2004a).

SDL was born as a result of this emerging logic that gave co-production a new meaning and led the concept of co-creation of value. Chronological review of selected literature on co-production is presented in Appendix A.1.

The notion that regards customers as active participants in the making of the offering with their resources is the central idea of co-production. This view seems in line with Firat et al.'s (1995, p. 51) postmodern take on marketing as he argues "the product is likely to become less and less finished object and more and more a process into which the customer can immerse oneself and can provide inputs". Yet, the importance of elaborating co-production within the boundaries of SDL comes from SDL's exploratory power over this process that encompasses all actors in the marketplace, indicating co-production is not the end itself but the beginning of a deeper commitment that starts by creating joint value in production (Ballantyne and Varey 2006).

In order to understand the nature of the commitment made by joining parties and the process that they are expected to create, the foundational premises (FPs) of SDL need to be elaborated. Overview of SDL's FPs is presented in Table 2.1.

Foundational Premise 1: Service is the fundamental basis of exchange

In the original article that introduced the FPs of SDL, foundational premise (FP) 1 read; "The application of specialized skill(s) and knowledge is the fundamental unit of exchange" (Vargo and Lusch 2004a, p. 6). The reasoning behind this idea was simple. Parties in the market place exchanged mainly operant resources to acquire different benefits (Lusch and Vargo 2006, Vargo and Lusch 2004a). While the intended emphasis needed to be on the concept of "benefits", long-lasting traditions of marketing directed audiences to concentrate on the concept of "unit of exchange" instead. DNA of

marketing which was coded by, “marketing is the exchange which takes place between consuming groups and supplying groups” (Alderson 1957, p. 15) led to the interpretation of the foundational premise as units of outputs, however *better* they might be, were being exchanged. Consequently, FP1 was criticized for adopting a GDL perspective in explaining a new dominant logic (Ballantyne and Varey 2006).

Table 2.1: Foundational premises of Service Dominant Logic

FP1	Service is the fundamental basis of exchange
FP2	Indirect exchange masks the fundamental basis of exchange
FP3	Goods are distribution mechanism for service provisions
FP4	Operant resources are the fundamental source of competitive advantage
FP5	All economies are service economies
FP6	The customer is always a co-creator of value
FP7	The enterprise cannot deliver value, but only offer value propositions
FP8	A service-centered view is inherently customer oriented and relational
FP9	All social and economic actors are resource integrators
FP10	Value is always uniquely and phenomenologically determined by the beneficiary

Source: Stephan L. Vargo and Robert F. Lusch, R.F. 2008. Service-dominant logic: continuing the evolution. *Journal of the Academy of Marketing Science*. 36 (1), p. 7.

Respectively, FP 1 was reformulated in which, “service” was argued to be the center of all activities. The crux of the discussion here is the definition of service, and how it differentiated from “services” and “goods” (Vargo and Lusch 2008a).

Vargo and Akaka (2009, p. 34) define service as “the application of competences for the benefit of another”. Such application is an ongoing process in the market place that eventually breeds units of outputs. Therefore, limiting marketing to the emergence and literal exchange-of-outputs is replaced by a process, based on exchange of performances that are direct results of different competences (Moeller 2008).

Foundational Premise 2: Indirect exchange masks the fundamental basis of exchange

Once it has been established that fundamental basis of exchange is service, FP 2 probes deeper to explain the effect of indirect exchange on service. In order to attend to this issue, the meaning of indirect exchange needs to be established. According to Lusch and Vargo (2006), indirect exchange is the stretch marketing took after the Industrial Revolution to create efficiency. It is basically losing sight of what is really being exchanged and considering goods, money, and micro specializations to be the basis of exchange (Vargo and Akaka 2009, Moeller 2008, Lusch and Vargo 2006). It is the emphasis marketing puts on manufacturing process to create profit maximization through increasing individual efficiency, in return, sacrificing collaborative competence that will lead to acquiring and distributing knowledge and competence that will enable “service-for-service exchange” (Moeller 2008, p. 199). Consequently, the basis of exchange shifts from increasing collective competency to increasing individual competencies to create efficiency and profit maximization which masks the focal point of marketing.

Foundational Premise 3: Goods are distribution mechanisms for service provision

Shaw in 1912 (p.12) had argued that marketing was about “applying motion to matter”, suggesting it was mainly concerned with the production of goods and their distribution. Therefore, the focal point was the tangibles which carried the service rather than the service itself. However, goods were only surrogates for the benefits that the customer hoped to achieve. Gutman (1982, p. 61) explains this point by “act of consumption must occur in order for the desired consequences to be realized”. Therefore, regardless of the form the offering comes in to be consumed, the consumer is only interested in the service that it will render (Gummesson 1995). Consequently, any effort directed in explaining marketing should regard goods as platforms (Lusch and Vargo 2006) in creating benefits desired.

Foundational Premise 4: Operant resources are the fundamental source of competitive advantage

The importance given to resources in creating desired effects is not new. However, the distinction between different resources and the importance given to each in creating desired outcomes only date back to work of Constantin and Lusch (1994).

Operant resources, defined as the resources which produce desired effects when employed on operand resources, are considered to be the fundamental source of competitive advantage (Vargo and Lusch 2004a, Constantin and Lusch 1994). Knowledge, skills and mental competencies are at the center of operant resources which bring operand resources, such as money, material or time to life. Therefore, the ultimate source of competitive advantage is humans, where they collaborate through their intangible and dynamic resources to create benefits for each other (Vargo and Lusch 2008a).

Foundational Premise 5: All economies are service economies

In their article of 2004, Lusch and Vargo (2004a, p. 10) assert “economists have taught marketing scholars to think about economic development in terms of eras or economies”. A quick review of literature proves neat classification of eras throughout marketing thought (Wilkie and Moore 2003, Bartels 1976). However, one of the most recognized distinctions is the transition from goods economies to services economies (Fisk et al. 1993). According to Fisk et al. (1993), starting with 1980s, the inevitable rise of services had major influence on marketing arena and led to discussions on customer retention (Grönroos 1990), relationship marketing (Berry and Parasuraman 1991) and internal marketing (Gummesson 1987), all of which have a strong position within the SDL. Therefore, suggesting that the rise of services economy had a huge impact on the foundation of the new dominant logic is inherently accurate. Similarly, first version of FP 5 in the original article of SDL (Vargo and Lusch 2004a, p.10) read “all economies are services economies”. However, in 2008 the FP 5 was modified to “all economies are service economies” (Vargo and Lusch 2008a, p. 7).

The distinction between the former and the latter forms of the FP is crucial. In original version, services were used as the superior version of an output as compared to

goods(Vargo and Lusch 2004a). Whether in a tangible or an intangible form, the companies had to act as services companies to retain and maintain customers through outputs. In the latter version, service is used to define a process rather than the restricted or static output. The difference is services indicate a static and a restricted output used as surrogates in discrete episodes of exchange; service, on the other hand, indicates a process of commitment of resources to create value that is extractable in use (Vargo and Lusch 2012).

Foundational Premise 6: The customer is always the co-creator of value

FP 6 is another foundational premise that was modified through the years. The original foundational premise reading; “the customer is always a co-producer” was criticized, since it suggested that SDL was limited to activity of production (Vargo and Lusch 2004a, p. 10). Vargo and Lusch (2008a, p. 8) explain although “co-production is a component of co-creation of value...especially goods are used in the value creation process”, co-production is not the end-in-itself but a stepping stone in reaching to the stage of participation during creation of value. SDL stands much more than collaboration during production stage, which suggests a process inside the boundaries of the firm, being limited to an output (Payne et al. 2008).

Co-creationrelies on the diversity, quantity, and quality of operand and operant resources that will be made available for integration of the service system (Edvardsson et al. 2011). As important as it is to establish the commitment to service system as early as the production stage, it is not possible to argue that co-creation of value takes place through sole production activity, as value co-creation includes the stage of value-in-use (Grönroos 2011).

Customer, acting as the party that determines the value through superior value propositions supplied by the company (Payne et al. 2008), will always be the co-creator of value.

Foundational Premise 7: The enterprise cannot deliver value, but only offer value propositions

According to Kambil et al. (1996, p. 6) the root of value propositions is escaping commoditization trap, where “items of value is packaged and offered to fulfill customer needs” by the company. Similarly, Lanning and Michaels (1988) define value propositions as act of declaration on how the customers will benefit from the offering. Consequently, offering value propositions to enhance the value derived from the offering is not new *per se*. Value propositions are ways for companies to get ahead in the game of competition. Once the proposed value is accepted by the customer, the company keeps its promise and delivers the proposed value to its customers (Ng and Smith 2012). Therefore, value is a promise as pre-defined and static as the offering itself (Grönroos 2008) that is determined and delivered by the company (Etgar 2008). Once the customer accepts the value proposition, the delivered value is consumed by the customer as constituted by the company (Vargo and Lusch 2008, Vargo and Lusch 2004a).

Contrary to the view above, SDL asserts that value cannot be pre-defined and delivered, because it is neither restricted, nor confined. Value is not something out there to be delivered or consumed, but it is a vision reached through joint commitment of resources during consumption stage. Such vision is ignited by continuous value propositions provided by the company and translated into value by all parties’ “skill sets and competencies” (Ng and Smith 2012, p. 226).

Foundational Premise 8: A service-centered view is inherently customer oriented and relational

At first sight, FP8 may seem as nothing more than stating the obvious. Any kind of process that is directed at the customer that involves offering of value propositions have to be customer oriented and relational (Vargo and Lusch 2008a). This is why, FP8 is best explained through not by what it is, but through what it is not.

Vargo and Lusch (2006) citing Davis and Manrodt (1996) explain that the offering which is presented as the solution to customer’s problem or need, regardless of the solution being a tangible or an intangible, is beyond the point. What really counts is the

interaction takes place to understand or define customer problem or need and the process the company and the customer embark on to develop a solution for the stated problem. Therefore, the focal point of interaction is truly the customer rather than customer needs. Furthermore, the customer needs are neither the beginning nor the end to the relation developed. Because the relation that the parties carry out determines the true nature of the offering as well as the value that will be derived from the co-produced output, regardless of the problem or the need customer expresses. Moreover, the journey they take on to define and solve the problem, even if it is limited to a single transaction-borrowing GDL jargon, will always be relational because the partnership they have created is not about the solution itself but the customer experience, which neither party can stamp an expiration date on (Vargo and Lusch 2006).

Foundational Premise 9: All social and economics actors are resource integrators

The discussion on resources has a much longer history than SDL. Through one of the well-recognized theories of marketing that puts resources in its epicenter, resources were defined as; “tangible and intangible entities available to the firm that enable it to produce efficiently and/or effectively a market offering that has value for some market segment(s)” (Hunt 2000, p.138). Respectively, Hunt and Derozier (2004) classified resources into five distinct categories by:

- a. Physical resources such as company’s finances, equipment;
- b. Human resources such as skills, competencies of the labor force;
- c. Organizational resources such as company’s structures and systems;
- d. Informational resources such as company’s overall learning ability and sources;
- e. Relational resources such as brand equity.

Building on Constantin and Lusch’s (1994) categorization of operant and operand resources, Madhavaram and Hunt (2008) proposed a hierarchy of resources in order to contribute to strategy building of the firm.

Although, these contributions are very important for the conceptualization of resource-based thinking, FP 9 is not about how we divide and define resources but the way we think they contribute to the process of co-production. One of the first conceptualization of resources with similar point of view to SDL belongs to Zimmermann (1951) as he argued resources are not important for what they are, they are important for what they become. Similarly, in 1959 (pp. 24-25), Penrose argued that “it is never *resources* themselves that are the ‘inputs’ to the production process but only the *services* that the resources can render”. The main idea behind her thinking was that the array of resources one may hold as well as those resources’ importance in relation to one another are relatively less important compared to their potential to render service once the beholder of the resources decide to invest them into the process. So, individual resources that are not exploited, even the operant ones, are worthless in service creation, and they only bear a meaning in a context created by resource integrators.

Foundational Premise 10: Value is always uniquely and phenomenologically determined by the beneficiary

Tightly bundled in the discussion related to importance of context as mentioned in FP 9, the last foundational premise of SDL argues that “value is idiosyncratic, experiential, contextual and meaning laden” (Vargo and Lusch 2008a, p. 7). In other words, it is not possible to take the agent or subject out of the value creation discussion as the value created is always explained in terms of the beneficiary. Vargo and Lusch explain (2006) it is the beneficiary’s perceptions and experiences that give meaning to value. This point suggests that regardless of the firms’ efforts to co-create value through providing various value propositions even in cases, where such propositions offered to different customers are identical, the co-created value will always be unique because no two beneficiaries will make use of such value propositions in a same way using identical capacities, experiences, meanings as the value will always be specific to customer’s context (Grönroos and Voima 2013).

The review of literature on foundational premises of SDL leads to overview of fundamental role of value creation process and the importance of production and consumption stages throughout the process discussed.

2.2 VALUE CREATION PROCESS

Understandably, the value creation process encompasses all three created values discussed in earlier sections: value-in-production, value-in-exchange, and, finally, value-in-use.

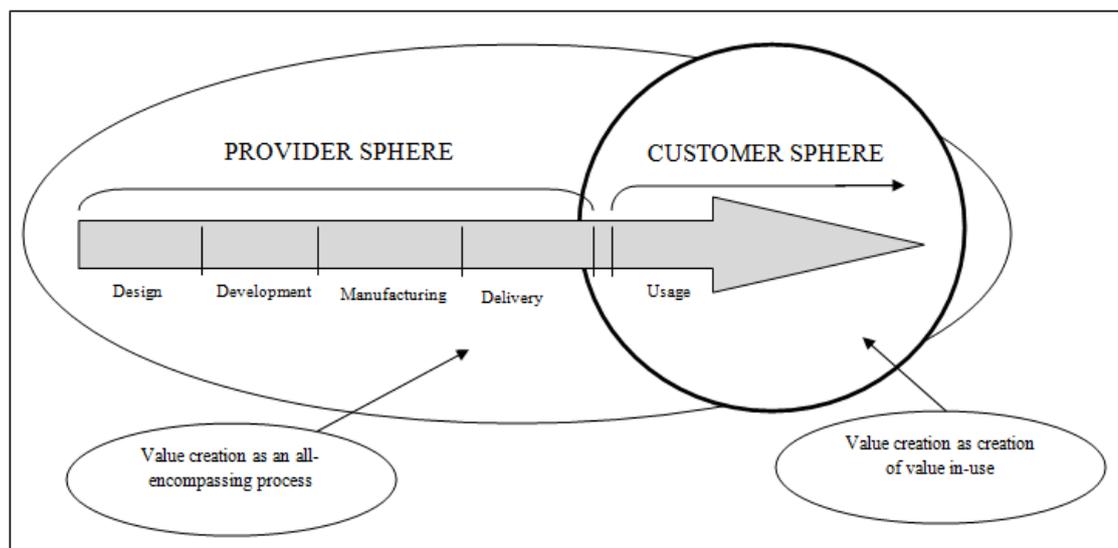
As the name implies, value-in-production is the value created in production stage. However, in line with activity network chain notion, the customer has active involvement in production stage with his/her resources. Such collaboration presents itself through shared innovative knowledge, co-design, co-manufacturing, all of which generally referred to as co-production in SDL literature (Etgar 2008, Vargo and Lusch 2008a, Vargo and Lusch 2006, Vargo and Lusch 2004a, Vargo and Lusch 2004b). Although the shared value achieved through co-production is expected to comply better with the needs of the parties, the generated value is still represented and limited with an output of a good or a service. It is generally a process where the customer is invited by the company to produce value that fits better with his/her unique needs rather than GDL's point of view, where the company assumes, creates, and embeds the value in goods on behalf of the customer. Although co-production is hosted and orchestrated by the company, it includes real investment on customers' part to realize value (Grönroos 2006). The co-produced output is exchanged in the marketplace with investment of other parties, such as various types of intermediaries, and additional value is realized, which SDL labels as value-in-exchange. Finally, the offering enters customer's sphere to be consumed (Grönroos 2008, Grönroos 2006). The consumption is basically consumer's efforts to extract value from the co-produced offering and deplete the offering by incorporating it to his/her life, which the SDL literature recognizes as value-in-use. As argued previously, offerings are not value *per se* (Bastiat 1848, Mill 1848, Say 1821, Smith 1776/1994), but they are basis for bundles of value, that is extractable in use to realize various sorts of gratifications (Vargo and Lusch 2008, Vargo and Lusch 2004a).

The pitfall of this view is that if value can only be realized in consumption, and since the customer is the only active party during this stage, it seems as though the customer is basically creating value for him/herself without cooperating with any other party of the value chain. Grönroos (2008, 2006) simply asks as he argues this obvious point; if

the value is extracted by the user, for the user, what is the role of the company in the process? Why is the company called the co-creator?

The logic behind it is rather simple. The company can only become a co-creator of value if it is invited by the customer to the value extraction stage. Grönroos (2008) articulates, resembling the co-production stage where the companies invite their customers to produce value, this time, companies are invited to value extraction and consumption stage to co-create value with their partners taking part in value-in-use. Such logic, again, points in the direction of “marketing as a process” since the parties involved go through various stages, one leading to other and hand-in-hand to realize the ultimate value for the customer and perhaps for further consequences that will be discussed in next sections. Grönroos (2011) explains the distinction through his figure of value creation process in Figure 2.1. According Grönroos (2011), the whole sequence of activities generate value which is extractable in customer’s sphere. However, limiting value to value-in-use contradicts the fundamental tenets of SDL as such view overlooks the commitments made prior to consumption of goods and services in production and exchange represented by provider sphere.

Figure 2.1: Value creation as the customer’s creation of value-in-use or as an all-encompassing process including provider and customer activities



Source: Christian Grönroos, 2011. Value co-creation in service logic: A critical analysis. *Marketing Theory*. **11** (3), p. 283.

Such distinction breeds the question if the real value is realized by the mutual efforts of the company and the customer in consumption stage in customers' sphere, what is the role of co-production? According to Vargo and Lusch (2009, p. 230) co-production is "an optional subset of the non-optional value co-creation. That is, co-creation is the common denominator for the value creation and superordinate to co-production in the same way that service is superordinate to goods". Nonetheless, the SDL literature's support for the linkage between co-production and co-creation is limited to conceptual reasoning and struggles to go beyond faith without empirical evidence.

According to Brown and Bitner (2006, p. 401) "the ultimate form of customer co-production is customer self-service (primarily through technology) and we see it as best practice". Therefore, co-production in form of self-service needs further review.

2.3 CO-PRODUCTION THROUGH SELF-SERVICE

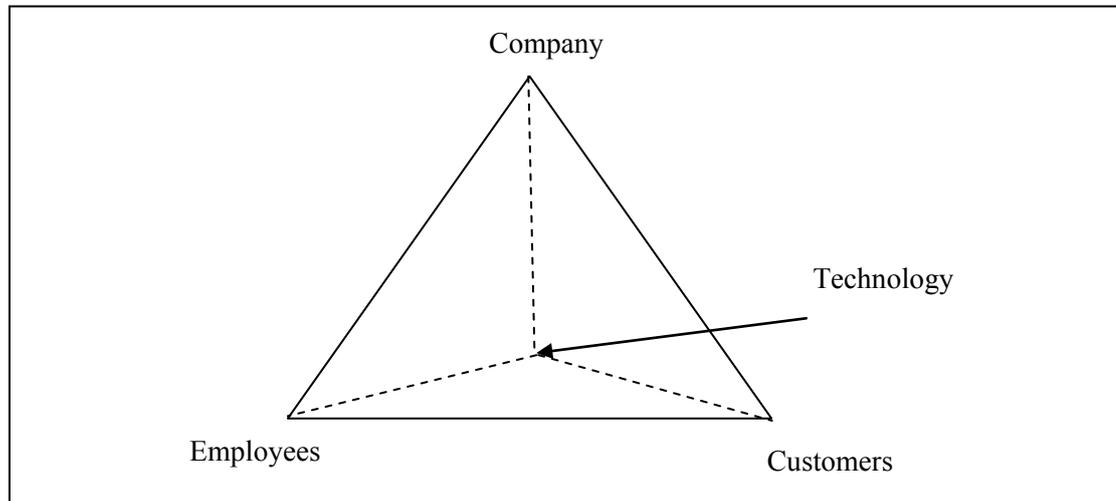
Self-service is a form of co-production usually associated with technological innovations (Andreassen et al. 2010). It has been proposed as the model-fit example of co-production since the service provision cannot be completed without customers' involvement with their operant and operand resources (Eastlick et al. 2012, Meuter et al. 2005). Furthermore, Brown and Bitner (2006, p. 401) assert "the ultimate form of customer co-production is customer self-service (primarily through technology) and we see it as best practice".

Co-production through self-service technology (SST) refers to customers producing all or part of the service via technological means without direct interaction with the employees of the firm (Chen 2005, Meuter et al. 2000). Common examples of SSTs in marketing literature include vending machines, automated phone systems, transactions via Internet such as online banking, Internet shopping, kiosk machines, self-pay gasoline pumps, self-check-out scanners, and automated teller machines (Eastlick et al. 2012).

Marketing literature has produced various classification schemata starting from categorization of technology use during service provision to different service delivery options via technology. One of the basic models that explains usage of technology

during service provision belongs to Parasuraman and Grewal (2000) presented in Figure 2.2.

Figure 2.2: The pyramid model



Source: A., Parasuraman and Dheruv, Grewal, 2000. The impact of technology on the quality-value-loyalty chain: a research agenda. *Journal of the Academy of Marketing Science*. **28** (1), p. 171.

According to Parasuraman and Grewal (2000), technology may be utilized by the company, employees and customers to generate service delivery and efficiency. Similarly, Dabholkar (1994) argued that there were three different ways to integrate technology in service delivery. First, technology could be used by employees besides the front line personnel of the company, behind the scenes to increase efficiency. Second, front line personnel could use technology to gain and provide various advantages. Finally, technology could be used by customers themselves to generate the service (Dabholkar 1994).

Similarly, Meuter et al. (2000) offered a schemata delineating how technology could be utilized as an interface to serve different purposes during service encounter, presented in Figure 2.3. The purpose of the use of technology could be divided into three main categories of: customer service, transactions, and self-help (Meuter et al. 2000).

Meuter et al. (2000, p. 61) conclude “Technology has become an integral part of the marketplace. Customers are increasingly given the option or are being asked to provide services for themselves through the use of SSTs”, regardless of the differences between interfaces and purposes sought. Inevitability in technology usage during service

production results in an increase in the variety and availability of different SSTs (Eastlick et al. 2012).

The obvious increase in such means of service delivery points to companies' tremendous investment in providing SSTs. The expected benefits of this investment include productivity gains (Lovelock and Young 1979), increased competitiveness (Gallagher 2002), and satisfaction and loyalty (Meuter et al. 2003, Yen and Gwinner 2003) as well as ensuring a consistent service delivery through by-passing the human factors of service delivery, pointing towards the elimination of perishability and heterogeneity factors of service provision (Eastlick et al. 2012).

Figure 2.3: Categories and examples of SSTs in use

Interface Purpose	Telephone/ Interactive Voice Response	Online/ Internet	Interactive Kiosks	Video/CD*
Customer Service	- Telephone banking - Flight information - Order status	-Package tracking -Account information	- ATMs - Hotel check-out	
Transactions	- Telephone banking - Prescription refills	- Retail purchasing - Financial transactions	- Pay at the pump - Hotel check-out -Car rental	
Self-help	- Information telephone lines	-Internet information search - Distance learning	- Blood pressure machines - Tourist information	-Tax preparation software - Television/ CD based training

Source: Matthew L., Meuter, Amy L., Ostrom, Robert I., Roundtree, and Mary Jo, Bitner, 2000. Self-service technologies: understanding customer satisfaction with technology-based service encounters. *Journal of Marketing*. 64 (3), p. 52.

Any investigation of co-production in SSTs setting suggests two important points to be explored. First, the dimension of customer participation suggests behavioral changes on customers' end, since implementation of technology does not suggest actual adoption behavior. Therefore, delineation of such behavioral changes is needed to be explored (Meuter et al. 2005).

Second, as such changes occur via technology, specific dimensions of technology acceptance calls for careful consideration (Parasuraman 2000). Understandably, extensive amount of previous research concentrates on such behavioral changes taking the technology dimension into account. However, to the best of the knowledge of the researcher, there has been no previous research that regards co-production as a process within itself. Furthermore, no previous research has considered the co-production process as an integral part of a bigger process of value co-creation. Moreover, only a limited number of previous research (Xie et al. 2008, Bobbitt and Dabholkar 2001) attempts to link well-established theories of marketing to explain co-production process. In order to address such issues, the relevant literature on co-production process and its link to co-creation of value is discussed next.

2.4 CO-PRODUCTION PROCESS

Paradoxically, marketing literature's tremendous interest in SDL in general and co-production in specific has produced a single study that actually attempts to explain the co-production as an integrated process. Etgar (2008), among many scholars who have argued co-production to be process rather than discrete transactions, was the only scholar to produce a descriptive model that shed light on co-production process phenomenon. Etgar's (2008) descriptive model adapted from his conceptual article was introduced earlier through Figure 1.1 in section 1.1.

2.4.1 Antecedent Conditions

Despite the frequency of the term "antecedent conditions" usage in marketing literature, there seems to be no proper definition for it. Etgar (2008) defines antecedent conditions as prior conditions that are needed to be established to initiate the process. Similarly, in management and organizational studies, antecedent conditions have been defined as triggers of behavior (Smith 1992). Although conceptualization of such triggers has been well-established in the literature, the recognition of them as antecedent conditions has been lacking.

Etgar (2008) proposes that there are four distinct sets of antecedent conditions as factors that will increase the willingness of customers to engage in co-production. Three of these factors, namely customer linked, product linked and situationally linked factors

are articulated further throughout this section. The fourth factor, macro-environmental conditions are not included in the study as such factors encompass more macro level conditions. According to Etgar (2008) co-production has higher chance of practice in mature economies. Therefore, the economical environment of the country should be taken into consideration. Similarly, “cultural schema” that the customer shapes his/her social life may impact on co-production exercises (Etgar 2008, p. 99). Since, such macro level economic and cultural considerations are beyond the restricted scope of this study they will not further articulated. Service linked factors are included as the fourth dimension of antecedent conditions for this study.

2.4.1.1 Customer linked factors

Although not recognized as co-production, as early as 1930s, customers were taking part in delivery of the services (Bendapudi and Leone 2003). Yet, in 1978, Chasestill described the role of customer during service delivery as simply being present. Approaching to 1980s, marketing literature viewed customers as partial employees, if trained accordingly by the company, could contribute to the process as a source of competitive advantage (Mills and Morris 1986, Lovelock and Young 1979). In 1985, Silpakit and Fisk defined co-production as consumers’ mental and physical efforts to participate in production and delivery of services. It was considered a step forward from the customary view because it meant, customer was no longer an inactive party that could only contribute through adequate training supplied by the company but an active agent that had his/her own accumulated or potential resources (Vargo and Lusch 2006).

Respectively, customer linked factors are defined as factors that effect customer’s inclination to engage in co-production (Etgar 2008). They are the prior conditions in terms of self capacities and individual characteristics to understand which customers are more prone to co-produce in SST settings.

2.4.1.1.1 Self capacities

One of the important contributions of Lusch et al.’s (1992) article was the introduction of different sorts of capacities. Yet, the article failed to provide a definition for “capacity”. Similarly, there seems to be a general confusion around the terms competencies, capabilities and capacities. Before advancing to the delineation of

customer capacities, it will be orderly to explain the intended meaning for the term capacity.

Madhavaram and Hunt (2008, p. 68) argue that capabilities and competencies can be used interchangeably to explain;

socially complex, interconnected combinations of tangible basic resources (e.g., specific machinery, computer software and hardware) and intangible basic resources (e.g., specific organizational policies and procedures and the skills, knowledge, and experience of specific employees)

While capabilities and competencies are defined to cover the similar domains in the literature, capacities have completely different meaning. According to Vincent (2008, p.1) capacity can be explained by “amount” or “volume” that one can hold, receive or accommodate. Therefore, while the former may be explained in terms of resources, the latter is about the level of such resources, competencies, or capabilities.

Expertise capacity

The studies surrounding the construct of expertise are usually tied around the greater domain of knowledge (Mitchell and Dacin 1996, Alba and Hutchinson 1987). Alba and Hutchinson (1987, p. 381) argue that knowledge is made of familiarity and expertise as they define expertise as “the ability to perform product related tasks successfully”. Similarly, Mitchell and Dacin (1996) form the definition of expertise through knowledge and experience. While developing a measure for expertise they consider previous knowledge as the sole building block. Along the same line of reasoning, “subjective expertise” has been conceptualized by Philippe and Ngobo (1999, p. 570) and defined as the perception of one’s ability to perform tasks. The emphasis on this definition should be regarded on the concept of “ability”.

The first article that alienates expertise from the strict boundaries of accumulated knowledge or abilities and conceptualizes it closer to what later literature came to know as operant resource comes from Lusch et al. in 1992. They define expertise capacity as *level* of skill or knowledge already possessed or potential to acquire skill or knowledge (Lusch et al. 1992). There are two important points needed to be made with regard to this definition.

First, while the former two definitions restrain expertise within the limited boundaries of already accumulated knowledge; the latter argues expertise is not only about what an individual already knows but also about the potential his/her accumulated experience will breed. Second, the definition provided by Lusch et al. (1992) not only covers the full domain of the construct but is also in line with the definition provided for the term capacity in the previous section, which suggests the importance of *level* of accumulated knowledge as well as the potential.

Expertise capacity, in its restricted form of already accrued knowledge has been investigated in self-service context. The common construct used to demonstrate accumulated knowledge is previous experience and it is defined as “the amount of usage” (Meuter 1999, p. 187). In SSTs context, previous experience has been reported to have positive relationship with trial (Meuter et al. 2005), attitude (Reinders et al. 2008), and preparedness to use (Eastlick et al. 2012). Furthermore, the importance of ability in explaining trial in SSTs has been investigated by Meuter et al. (2005).

Risk-taking capacity

The concept of risk, in the broadest sense, has been associated with literature around the construct of trust (Mayer et al. 1995). It has been suggested that individual’s behavior will be influenced by the factors of risk preferences, risk perceptions and risk propensity (Sitkin and Pablo 1992).

Brockhaus (1980) defines risk preferences as an individual characteristic that determines person’s actions. Therefore, risk preferences are the range of risks that are evaluated by each individual that leads to relative risk calculations (Brockhaus 1980). Quite similarly, Sitkin and Pablo (1992) explain risk perception as mere calculation of the risk involved on three separate dimensions. The first dimension is the situations considered to be risky by the individual (Jackson and Dutton 1988, Dutton and Jackson 1987), second is the extent the situation is perceived risky and third is the individual’s confidence in the estimates(s)he has made regarding the extent of the risk (Vlek and Stallen 1980).

Sitkin and Pablo (1992) differentiate risk perception from risk propensity, defined as the *level* of tendency to take or avoid risks (pp. 18-19). Similarly, MacCrimmon and Wehrung (1986, p. 25) define risk propensity as “measures of willingness to take risks”.

The intended definition of risk-taking capacity lies in the domain of risk propensity, in a way that risk taking capacity is not about the variety of risks involved or precise calculation individual makes while embarking on a situation but it is about how much risk s(he) is willing to absorb while doing so. Therefore, the operative phrase surrounding risk-taking capacity is *level of willingness* or *level propensity* rather than level of risk itself (Sitkin and Pablo 1992).

To the best of the knowledge of the researcher, risk-taking capacity has never been used in co-production context. Yet, perceived risk described as uncertainty of consequences (Campbell and Goodstein 2001, Dowling 1986) has been a construct of interest.

De Ruyter et al. (2001) have reported that perceived risk had a negative effect on behavioral intentions to use e-services. Meuter et al. (2005) have demonstrated perceived risk is a strong inhibitor of role clarity and motivation in automated refill system context. Similarly, perceived risk was found to have a strong inhibiting influence on Technology Acceptance Model (Davis 1989) variables on e-services (Featherman and Pavlou 2003).

Resource capacity

As stated previously, the distinction between operant and operand resources dates more than two decades back. Operant resources, regarded as those resources that bring operand resources to life, are at the heart of SDL discussion. Expertise, skills, abilities, and knowledge are considered to be the most important operant resources. Furthermore, it is only through their effect on operand resources that the production of service is possible (Grönroos 2011, Grönroos 2008, Lusch and Vargo 2006, Vargo and Lusch 2004a). Yet, the relative importance of operant resources does not nullify the importance of operand resources. Ultimately, customers may bear the highest degree of operant resources but they still need variety of operand resources to employ them upon (Vargo and Lusch 2004a).

Although, the use of experience and ability, the two most important operand resources customary in literature (Eastlick et al. 2012, Meuter et al. 2005), to the best of the researcher's knowledge, there exists no research model that includes operand resources.

Resource capacity is a concept introduced by Lusch et al. (1992). They describe resource capacity as resources besides expertise and time, such as physical objects, space, money, and materials (Lusch et al. 1992, p.127). Although such resources are not specified as operand resources *per se*, the definition and examples provided are in line with conceptualization of operand resources.

The important distinction made by Hall (1993) clarifies the discussion around resource capacity. According to Hall (1993, p. 611), being resourceful is closely related to what one can “do”, whereas resource capacity refers to resources one “has” in order to do. Accordingly, resource capacity points in the direction of static possessions that enable production.

2.4.1.1.2 Individual characteristics

Individual characteristics stand for idiosyncrasies among consumers that shape their personalized preferences (Lin and Hsieh 2006). Such differences include need for interaction and perceptions regarding their readiness to use technology.

Need for interaction

Relying on the accepted view of traditional service delivery, customers have to be present to receive the service (Chase 1978). Previous research has demonstrated that contact with service employee was an integral part of the service experience; thus, extremely important to the customers (Cowles and Crosby 1990, Bateson 1985). Furthermore, such interaction was seen as the true source of service quality assessment (Surprenant and Solomon, 1987, Grönroos 1982). Relying on previous literature (Zeithaml and Gilly 1987, Breakwell et al. 1986), Dabholkar (1996, p. 36) argued that “some people feel strongly that the use of machines in a service encounter dehumanizes the interaction”.

However, following the inevitable advancement on technology, the nature of the available service delivery options has changed (Eastlick et al. 2012). Accordingly, previous research results have investigated the relationship between need for interaction and various constructs. Bateson (1985) and Langeard et al. (1981) have demonstrated that need for interaction was negatively related to willingness to try self-service. Dabholkar (1996) presented that customers' with high need for interaction tended to evaluate the quality of service lower. Furthermore, Meuter et al.'s (2005) findings indicated that need for interaction negatively influenced their motivation to use SSTs.

Several other researchers (Chang and Obi 2011, Forman and Sriram 1991) have argued that need for interaction was not only a matter of desire to complete service delivery with a service employee, but also closely related to need to avoid machines. Forman and Sriram (1991) presented that customers with high need for interaction deliberately avoided using machines.

Dabholkar and Bagozzi (2002) demonstrated that high need for interaction decreased customers' intrinsic motivation to use SST options and their negative attitudes' impact on intentions was amplified.

Technology readiness

Advancements in technology have huge impact on the markets. According to Berry (1999), it took consumers 32 years less to adopt mobile phones than it took them to adopt automobiles. Yet, Parasuraman (2000) argues that every technological advancement comes with its frustrations since not all consumers are technologically savvy as others. While, for some consumers technology means frustration (Alsop 1999, Mossberg 1999) or anxiety (Meuter et al. 2003, Venkatesh 2000), for others it basically represents enjoyment or fun (Agarwal and Karahanna 2000). Therefore, defined as "people's propensity to embrace and use new technologies for accomplishing goals in home life and at work" (Parasuraman 2000, p. 308), technology readiness (TR) stands for a combination of mental enablers suggesting a positive feelings about the technology and mental inhibitors representing the negative end of the same continuum (Parasuraman 2000). Furthermore, Parasuraman (2000) argues the dissemination of technology will heavily rely on people's willingness to embrace such technology,

suggesting, regardless of the technology available or the investments made to proliferate it, the individual differences among consumers will determine the adoption and effective use of the technology.

According to Parasuraman (2000, p. 308), TR is “an overall state of mind resulting from a gestalt of mental enablers and inhibitors that collectively determine a person’s predisposition to use new technologies”. While enablers, namely innovativeness and optimism are considered to be the drivers of positive attitude towards technology and serving as the encourager of the usage of technological products and services, inhibitors, namely discomfort and insecurity are the drivers of negative attitude, preventing the adoption and usage of new technologies, technological devices and services.

Innovativeness

Parasuraman (2000, p. 311) asserts innovativeness is the desire to be technological pioneer or thought leader. As customers desire for innovativeness increase they tend to take lead role in adopting and using new technology (Yen 2005). Parasuraman (2000) has argued that customers’ longing to become an opinion leader of technological products and technologies encourages them to try new technologies. Consequently, customers grow a tendency towards technology urging them to keep up with cutting-edge technological developments (Yen 2005).

Optimism

The second leg of mental enablers of technology readiness is optimism. Optimism is customers’ positive view about technology in the sense that it enriches their lives through offering increased control, flexibility and efficiency (Parasuraman 2000). Zeithaml et al. (2000) explain that optimism is a technological convenience to a certain degree. Customers with high degrees of optimism embrace new technologies in order to gain beneficial outcomes (Yen 2005).

Discomfort

Not all customers have increased levels of tendency towards technology. Customers’ feelings of overwhelm with technology is argued to be an inhibitor for them to adopt new technologies (Parasuraman 2000). Customers with high levels of discomfort

experience inadequacy controlling it (Yen 2005). Consequently, higher degree of technological anxiety (Meuter et al. 2003) impacts their willingness to embrace new technologies (Liljander et al. 2006).

Insecurity

While discomfort is about one's distrust in own abilities regarding technology, insecurity covers the domain of overall and general distrust in technology (Parasuraman 2000). Individuals with increased levels of insecurity is highly skeptical about its performance to work properly (Yen 2005). Highly insecure individuals are generally reluctant to use technology because they fear that it will fail causing resistance to adopt and use technology (Liljander et al. 2006).

Marketing literature's interest in the relationship between technology, especially in self-service technologies context and consumers' adoption behavior has shown an increasing trend. Different dimensions of TR have been employed on different contexts such as self-check-in (Liljander et al. 2006), Internet and interactive voice response systems (Lin and Hsieh 2006), e-commerce (Yen 2005), and self-service kiosk machines (Zhu et al. 2007) to demonstrate that the each dimension of the multi-dimensional construct of TR explains the individual differences in readiness to embrace new technologies (Yen 2005).

2.4.1.2 Service linked factors

One of the central tenets of SDL asserts that customers do not buy goods and services for different reasons (Grönroos 2008, Vargo and Lusch 2008a, Vargo and Lusch 2006, Vargo and Lusch 2004a). A car is more than an engine, four seats and doors, a piece of steak is more than a part of an animal, a haircut is more than a loss of couple inches of hair. What this view suggests is explained by Gummesson (1995, p.250).

Customers do not buy goods or services: they buy offerings which render services which create value....The traditional division between goods and services is long outdated. It is now a matter of redefining services and seeing them from customer perspective; activities render services, things render services. The shift in focus to services is a shift from the means and the producer perspective to the utilization and the customer perspective.

Therefore, offering is a general term used as a surrogate in a process that is carried to out to create value for the customer and ultimately for the whole “activity network chain” (Etgar 2008, p. 98) through the investment of operant and operand resources. As previously discussed, such process consists of three sequential phases of value emergence and the first phase ends with the emergence of co-produced offering through collaboration and commitment of resources (Etgar 2008). According to Grönroos (2008, p. 301) the co-production phase can “actively be supported by the service provider”, generally discussed through full-service provisions, or “passively supported through self-service set-up”. However, regardless of the nature of the service provision, the basic assumption is the joint commitment of resources for the sharing of rewards. This view inherently suggests that customers’ perception of personal inputs (in terms of characteristics and capacities discussed above) and company inputs (in terms of company linked factors that will be discussed in the next section) are crucial to the co-production process. Yet, Etgar (2008) argues product linked factors, also, play a crucial role as a co-production antecedent. Then, the question becomes what sort of product linked factors serve as an antecedent condition in co-production.

The mission to scrutinize different factors that will serve as antecedent conditions under the rubric of product link factors fundamentally contradicts the central tenets of SDL. SDL’s fundamental premises encourage research to follow the path of service rather than products. As argued through FP3 which states “goods are distribution mechanisms for service provisions” and FP5 which explains “all economies service economies”, the base unit of collaboration is not the products but service that may come with a by-product in a tangible form (Vargo and Lusch 2004a). Consequently, Etgar’s (2008) quest for product linked factors have been replaced with service linked factors.

Neither SDL literature in general, nor co-production literature in specific reports specific service factors or attributes that may be used under the rubric of service linked factors. However, Etgar (2008, p. 100) argues that co-production will take place in product categories where there are large and noticeable differences in product attributes. This view seems in line with Simonson (2005) since he purports as the fit between customer preferences and product attributes tighten, customers will perceive greater benefits. If the customers engage in co-production to close the gap between

service attributes and preferences and invest their resources to do so, it is a straightforward argument that they would commit their scarce resources to service with certain qualities. However, the variety of service qualities linked to co-production makes the investigation of service linked factors next to impossible. Therefore, empirical studies in SST literature, accepting SSTs to be a type of innovation, commonly utilize perceived innovation characteristics as a surrogate (Eastlick et al. 2012, Liao and Lu 2008, Meuter et al. 2005, Meuter 1999, Moore and Benbasat 1991, Gatignon and Robertson 1985).

The use of innovation characteristics introduced by Rogers (1995) and technology acceptance model introduced by Davis (1986) in determining perceptions of customers in relation to SSTs is common.

Rogers (2002, p. 990) defines compatibility as “the degree to which an innovation is perceived as being consistent with the existing values, needs and past experiences of potential adopters”. It is argued to be a strong determinant of adoption since incompatibility with established values will automatically demotivate customer to engage in co-production. Earlier works have supported the positive relationship between compatibility and innovation adoption (Eastlick et al. 2012, Meuter et al. 2005, Eastlick and Lotz 1999, Korgaonkar and Moschis 1987).

Rogers (2002, p. 990) defines relative advantage as “the degree to which an innovation is perceived as better than the idea it supersedes”, and Meuter et al. (2005) argue the perceived relative advantage will serve as driving force and positively influence customers decision making process.

Complexity defined as, “the degree to which an innovation is perceived as difficult to understand and use” (Rogers 2002, p. 990) is argued to be negatively related to attitude towards SSTs since, as the nature of SST gets more and more complex, customers will be discouraged to learn about SST. Furthermore, their understanding of the benefits of SST may be negatively affected decreasing their motivation to engage in co-production. Previous findings support the expected relationship (Meuter et al. 2005, Eastlick and Lotz 1999).

The remaining two constructs of Rogers' (1995) original work are trialability defined as, "the degree to which an innovation may be experimented with on a limited basis" and observability as "the degree to which the results of an innovation are visible to others" (Rogers 2002, p. 990). Marketing literature points to limited number of studies where the two constructs were included in research models. In many different studies, trialability and observability dimensions were excluded from the study (Weijters et al. 2007, Chen et al. 2002, Dabholkar and Bagozzi 2002).

2.4.1.3 Company linked factors

In co-production context, customers are active participants of service delivery, alternatively labeled partial employees (Kelley et al. 1990, Bateson 1985) as they become crucial agents in completion of service provision. Company linked factors effect customers' motivation development to undertake the responsibilities and efforts to co-produce (Auh et al. 2007).

The crux of the entire phenomenon of co-production is voluntary collective work of the players to realize different sorts of value during the flow of the process. Although previous literature (Eastlick et al. 2012, Meuter et al. 2005) dwells on the customers' side of the collaboration, there is very limited evidence on companies' end of the bargain. Although it goes without saying that the customer, the company and the offering make up each essential leg of the trivet, limited guidance of the previous literature (Wu et al. 2012, Shamdasani et al. 2008) covers communication quality and service quality.

2.4.1.3.1 Communication quality

Communication quality, proposed as one of the key factors of success in any kind of company-customer relationship (Mohr and Spekman 1994), is viewed as customers' perceptions of company's specific efforts to keep them informed through direct communication (Odekerken-Schröder et al. 2003, Mohr and Nevin 1990). Auh et al. (2007, pp. 361-362) define communication as "the formal and informal sharing of meaningful and timely information" between parties. The limited amount of studies that regard communication quality as an important antecedent on company's part assert communication quality's positive effect on establishing successful relationships

(Sharma and Patterson 1999), inducing long-term commitment (Auh et al. 2007), and enabling socialization between the company and the customer as well as between fellow co-producers (Mills et al. 1983). Communication quality plays a crucial role as customers expect accurate and timely information to understand the role they are expected to play (Wu et al. 2012). Larsson and Bowen (1989, p. 225) argue the companies are encouraged or even expected to “cue different types of customer scripts” to foster customers’ role clarity and communication quality secures that such cues are delivered just the way they should get through.

Furthermore, relying on the work of Sharma and Patterson (1999), it is argued that the quality of communication determines the level of socialization between the customer and the company. Auh et al. (2007) argue that it is only this socialization that the customers will identify themselves with the company, embrace their role, and acknowledge the transition from customers to co-producers.

2.4.1.3.2 Service quality

On the contrary to rare inclusion of communication quality as a company linked factor in co-production context, literature has paid a great deal of attention to service quality (Shamdasani et al. 2008, Dabholkar 1996).

Lengnick-Hall et al. (2000) define co-production as engaging customers as active participants in company’s offering. Such engagement not only presents itself in evaluation of the final offering but also in the process of the delivery (Bateson 1995). Furthermore, in co-production context, as the proximity between the company and the customer decreases, customers have better opportunity in assessing the quality of the service on different dimensions.

One of the most widely used evaluations of service quality (SERVQUAL) comes from Parasuraman et al. (1988), as they define service quality through five distinct dimensions. These dimensions and their definitions are provided below (Parasuraman et al. 1988, p. 23).

- a. Tangibles: Physical facilities, equipment, and appearance of personnel;
- b. Reliability: Ability to perform the promised service dependably and accurately;

- c. Responsiveness: Willingness to help customers and provide prompt service;
- d. Assurance: Knowledge and courtesy of employees and their ability to inspire trust and confidence;
- e. Empathy: Caring, individualized attention the firm provides its customers.

Alternatively, Grönroos (1984) explains service quality in terms of functional quality and technical quality. Functional quality stands for customers' perceptions of the service delivery manner whereas technical quality, alternatively called outcome-based quality, is defined by the quality of the end-result the customer receives (Grönroos 1984).

Another, widely respected measure of service quality is SERVPERF from Cronin and Taylor (1992). SERVPERF is best explained by its distinction with widely known SERVQUAL (Parasuraman et al. 1988). While SERVQUAL is founded on the basis of gap model taking the difference between expectation-performance into account; Cronin and Taylor (1992) through SERVPERF argue that service quality "is a form of customer attitude and the performance only measure of service quality is an enhanced means of measuring service quality" (Seth et al. 2005, p. 920).

Service quality has previously been used in co-production studies usually as antecedent for customer satisfaction. Wu et al. (2012) and Shamdasani et al. (2008) have demonstrated that service quality is significant determinant of satisfaction in co-production context.

2.4.1.4 Situational factors

Social Cognitive Theory asserts customers are not only directed by their personal differences but also by environmental or situational factors (Gelderman et al. 2011, Oyedele and Simpson 2007). Therefore, the perceived advantages of the SST situation such as, convenient location (Wu 2012, Jones et al. 2003, Arnold et al. 1983), reduced waiting time (Meuter et al. 2000, Bateson 1985), or by-passing the crowd (Dabholkar and Bagozzi 2002, Machleit et al. 2000) of fellow service receivers are important drives for situational factors.

2.4.1.4.1 Access convenience

Although, convenience is one of the most frequently considered notions, it is rarely included as a unique construct in marketing studies (Wu et al. 2012). One of the reasons for such lack of utilization is argued to be poor development of the construct and consequently its ambiguous and contradictory results (Carrigan and Szmigin 2006, Warde, 1999, Darian and Cohen 1995, Yale and Venkatesh, 1986). Berry et al. (2002) assert that we are still to understand, define and examine ways to evaluate the construct of convenience.

In earlier days of its conceptualization, conveniences have been identified with six distinct categories. These categories are; time-saving, effort-saving, appropriateness, portability, avoidance of unpleasantness, and finally, accessibility (Farquhar and Rowley 2009). Of the six dimensions proposed, accessibility which includes proximity, availability and flexibility has gained most support. The main idea was to be convenient in time, place and execution (Yoon and Kim 2007).

Access convenience, determined by physical location and operating hours is argued to be an important determinant, as it minimizes the physical effort associated with the task of co-production. Berry et al. (2002, p. 7) argue “access convenience is a primary reason for consumer to self-perform certain services”.

The importance of location convenience has received a great deal of attention in marketing literature, especially in retail setting (Wu et al. 2012, Kuo et al. 2002, Arnold et al. 1978). One of the most widely accepted definition of the construct is “providing service to a customer at a place that minimizes the overall travel cost to the customer” (Jones et al. 2003, p. 703).

2.4.1.4.2 Perceived crowdedness

One of the earliest works on crowding belongs to Stokols (1972) as he points to actual or potential problems related to scarce space. As the individual perceive the space to be scarce, his/her motivation in relation to goal achievement may be compromised (Machleit et al. 2000). In earlier work, Bateson (1995) has demonstrated that perceived crowdedness decreases the perceived pleasure in a service setting. This is one of the

reasons for companies to invest in SSTs, which are aware of this relatively straightforward reasoning. Yet, empirical evidence to support this reasoning has been lacking.

Gelderman et al. (2011) argue relative time-saving advantage of SSTs, compared to full-service, combined with perceived social anxiety as a result of overcrowded service settings (Dabholkar and Bagozzi 2002, Machleit et al. 2000) encourage customers to head towards SSTs options.

2.4.1.4.3 *Perceived waiting time*

Researchers define two variations of waiting time throughout marketing literature: objective time, in continuous and metric time that can literally be measured by a clock, and subjective time, in perceptions of time influenced by psychological factors (Berry et al. 2002). According to Berry et al. (2002), subjective time is more relevant in service setting compared to objective time of wait.

Studies concentrating on the perception of time during 1990s have shown that waiting in lines, how objective or the subjective the wait time may be, has direct link to customer satisfaction (Hui and Tse 1996, Taylor 1994). According to Wallace (1995), perceived waiting time is one of the major drivers of SST usage. Dabholkar and Bagozzi (2002) argue that a customer, waiting in a line, becomes impatient after certain a point and leans towards SST option in order to compensate the time lost in line.

Perceived waiting time defined as consumer's perceptions of wait in relation to different service delivery options (Weijters et al. 2007, Dabholkar and Bagozzi 2002) has been frequently investigated in retail setting. Furthermore, Dabholkar and Bagozzi (2002) have empirically tested the effect of perceived waiting time in conjunction with perceived ease of use and perceived fun, on attitudes and intentions in SSTs setting.

2.4.2 Development of Motivations

According to Etgar (2008) the antecedent conditions serve as the forcers of motivation, which is the second stage in his descriptive model. This line of reasoning is philosophically in accordance with other works in motivation literature. As customers have the option of choosing between different alternatives in almost every aspect of

their lives, they must be “sufficiently motivated” to choose an offering, or alternative form of service delivery, as opposed to others (Meuter 2005, p. 64).

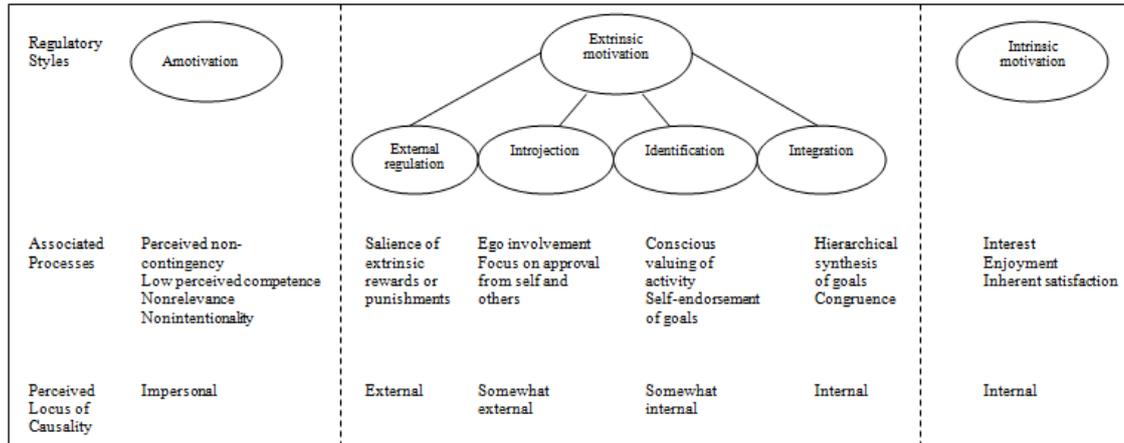
Motivation theories lie in diverse works of consumer psychology (Calder and Staw 1975, Deci 1972, Deci 1971, Mitchell and Biglan 1971, Lawler and Porter 1967, Vroom 1964). The conceptual foundation of motivation lies on the premise of self-interest (Lengnick-Hall et al. 2000, Meuter 1999, Schneider and Bowen 1995). Since motivation is argued to be a key determinant of behavior in marketing literature (Venkatesh and Speier 1999, Deci and Ryan 1985), various theories of motivation has been proposed over time. The most commonly cited theories related to motivation are considered to be Expectancy-Valence Theory (Vroom 1964), Self-determination Theory (SDT) (Deci and Ryan 1985) and Cognitive Evaluation Theory (Deci and Ryan 1980, Deci 1975).

Motivation is defined as the “study of why people think and behave as they do” (Graham and Weiner 1996, p. 63). Similarly, Ryan and Deci (2000a, p. 54) explain being motivated means “to be moved to do something”. Therefore, they define a person with *no desire to move* to be unmotivated, whereas a motivated person is one who is active. Ryan and Deci (2000a) assert that while such definition explains the basic concept of motivation, it does not capture its complexity since motivation is not a unidimensional construct that only lies on the premise of level or amount of action. As important as the level of drive is, it is equally important to understand the kind and orientation of the motivation. Therefore, research of motivation not only answers the “how much” question but also the “why” question (Ryan and Deci 2000a).

In an attempt to answer the “why” question, Ryan and Deci (2000b, p. 69) argue that the point all theories are striving to reach is that motivation is a complex phenomenon that cannot be treated as a “singular construct” since “people can be motivated because they value an activity or because there is strong external coercion”. The crux of the phenomenon is the idea that the common agent in almost all theories is the interest in intrinsic and extrinsic drives that make up the summated construct of motivation conjunctionally; hence, the distinction in marketing literature commonly marked as intrinsic and extrinsic motivation (Ryan and Deci 2000b).

Intrinsic drives, synonymized with intrinsic motivation are defined as, pleasure or satisfaction gained from the activity or performing the activity for no apparent reason other than the process of the activity *per se* (Davis et al. 1992, Deci and Ryan 1985, Deci 1971). Intrinsic motivation is apparent and natural in humans regardless of the situation because human beings, assuming they are healthy, are active and playful from birth in order to learn without any exogenous agenda (Deci and Ryan 2000a). Therefore, this drive to be active in life is a built-in mechanism that prompts the individuals to complete tasks in life without any external expectations. This is the main reason why Deci (1971) operationalized intrinsic motivation as “free choice”. Yet, as Deci and Ryan (2000a, p. 60) explain, the freedom of the childhood years is quickly replaced with social demands, roles, and responsibilities, and this is argued to be the reason behind the development of extrinsic motivation. As individuals start to bear responsibilities, the enjoyment of performing the behavior for its own sake is sacrificed in order to comply with outside regulations, to produce an acceptable level of performance or to achieve goals in life (Ryan and Deci 2000a). Consequently, extrinsic motivation basically refers to achieving a valued yet a separable outcome as result of performing an activity (Davis et al. 1992, Vroom 1964). Therefore, the distinction between the intrinsic and extrinsic motivation is that while the former is about the enjoyment of the activity itself, the latter is about the instrumental value expected to be obtained by performing the task. However, extrinsic motivation is a more complex phenomenon than it can be explained through simple exogenous expectations. According to Self Determination Theory (SDT) (Deci and Ryan 1985), extrinsic motivation is internalized to resemble more of intrinsic motivation through time. As presented in Figure 2.4, human motivation is best explained in a continuum starting with amotivation through intrinsic motivation.

Figure 2.4: Taxonomy of human motivation



Source: Richard M. Ryan and Edward L. Deci, 2000a. Intrinsic and extrinsic motivations: classic definitions and new directions. *Contemporary Educational Psychology*. **25**, p. 61.

The motivation taxonomy starts with amotivation which stands for not having intention to act (Ryan and Deci 2000a). Therefore, amotivation is the state the theorists were concerned with (Ryan and Deci 2000a), when the only salient factor in motivation measurement was its level or amount. According to such theories, deviation from amotivation represented the level of motivation. Following amotivation, individuals show various degree of external motivation. External regulation stands for the state in which behavior is carried out “to satisfy an external demand” (Ryan and Deci 2000a, p. 61). It is more of a compliance with external force than free choice. External regulation stands for behavior where “external perceived locus of causality” is salient (Ryan and Deci 2000b, p. 418). Moving towards intrinsic motivation comes interjected regulation, which is again similar to external regulation. The root of behavior still comes from outside elements under the feelings of pressure, anxiety, or guilt (Nicholls 1984). The third type of external motivation is identification, in which the behavior is performed to fulfill an external force, yet the consequence of the behavior is interiorized. The individual perceives it to be personally important and accepts the outside “regulation as his or her own” (Ryan and Deci 2000a). Finally, the last form of extrinsic motivation is integrated motivation which is the form that resembles the intrinsic motivation the most. In integrated regulation, outside regulations are fully identified with self. Yet, the reason it is considered to be external motivation is because the fact that the activity performed is “presumed to have instrumental value with respect to some outcome that is separate

from the behavior” (Ryan and Deci 2000a, p. 62). Therefore, SDT (Gagne and Deci 2005) represents an array of motivation where root of the motivation varies from controlled to autonomous.

When explaining the continuum starting from amotivation to developing motivation and internalizing motivation to reach intrinsic motivation, Ryan and Deci (2000a, p.64) emphasize the importance to one’s feeling of competence, self-efficacy and understanding, since individuals are “more likely to adopt and internalize a goal, if they understand it and have relevant skills to succeed at it”.

The importance of skills to perform a task has been considered to be the initiator of motivation and has already been discussed under antecedent conditions. However, the importance of understanding of the task one needs to undertake deserves further evaluation.

2.4.3 Evaluation of Cost and Benefits and Activation

Etgar (2008) defines third stage as calculation of co-production cost and benefits followed by fourth stage of activation. Such calculation, resembling a cognitive and/or affective aftermath, can be explained by increased motivation, which translates into behavioral intention through positive attitude. Consequently, behavior is formed through behavioral intention (Fishbein and Ajzen 1975). In order to understand this chain of causality, Theory of Reasoned Action (TRA) will be delineated in the next section.

2.4.3.1 Theory of reasoned action

Bobbitt and Dabholkar (2001) argue that the best known and supported attitudinal theory is Fishbein and Ajzen’s (1975) TRA. Similarly, Davis et al. (1989, p. 983) define TRA (Fishbein and Ajzen 1975) as “an especially well-researched intention model that has proven successful in predicting and explaining behavior across a wide variety of domains”. Furthermore, Bagozzi (1992) asserted that TRA has both theoretical and practical appeal to it. He explains TRA’s (Fishbein and Ajzen 1975) theoretical appeal through its ability to explain behavior and practical appeal through variety of contexts, in which the theory could be applied to successfully (Bagozzi 1992).

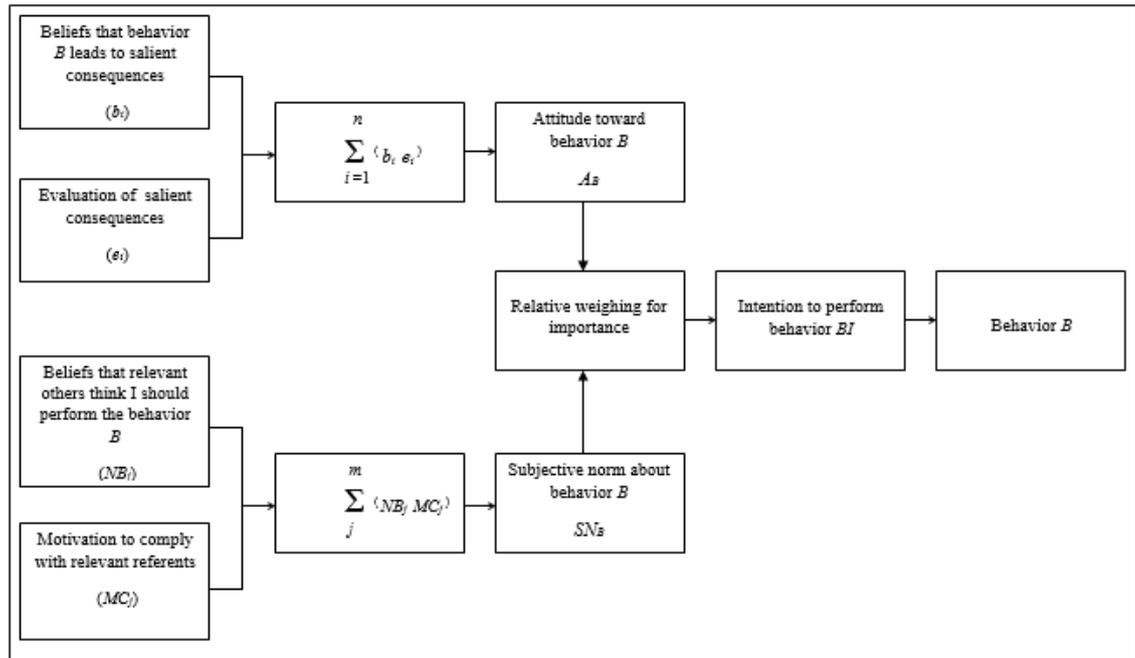
The main idea behind TRA (Fishbein and Ajzen 1975) is to understand the causes of behavior (Fishbein and Ajzen 1980). In doing so, TRA (Fishbein and Ajzen 1975) uses two separate links. These are the link between attitude and intention as well as the link between intention and behavior (Bobbitt and Dabholkar 2001).

The fundamental idea behind TRA (Fishbein and Ajzen 1975) is that before engaging in behavior, individuals consider the consequences of each behavior. Therefore, the behavior, that they choose to engage in, is a result of reasoned choice of intention (Peter and Olson 2005). Thus, the behavior of the person is the consequence of his/her intentions which are formed through reasoned choices. Consequently, individuals form intentions to engage in behaviors towards which they have positive attitude towards. Montano and Kasprzyk (2008, p. 68) explain “best predictor of behavior is behavioral intention, which in return is determined by attitude toward behavior and social normative perceptions regarding it”. Therefore, behavior is the produce of behavioral intention and subjective norm. TRA argues that attitude combined with subjective norm explains large variance of behavioral intentions; thus, it helps marketers predict different behaviors (Montano and Kasprzyk 2008).

Subjective norm is defined as person’s belief that specific individuals expect him/her to engage in a certain behavior. Such belief is then combined with person’s motivation to comply with outside expectations (Fishbein and Ajzen 1980). Figure 2.5 presents TRA Model.

The model specifies TRA is an attitudinal model that strives to explain “the relationship between beliefs, attitudes and behaviors” (Moore and Benbasat 1996, p. 133), through prediction of behavior, relying on person’s intention to perform the behavior. Furthermore, intention is the composition of attitude towards the behavior itself and the person’s own motivation to comply with subjective norms (Fishbein and Ajzen 1980).

Figure 2.5: Theory of Reasoned Action Model



Source: Martin Fishbein and Icek Ajzen, 1980. Predicting and understanding consumer behavior: attitude-behavior correspondence, in *Understanding attitudes and predicting social behavior*, Ajzen, I. and Fishbein, M. (Eds.), p. 159, Englewood Cliffs, NJ: Prentice Hall.

Arithmetically stated:

$$B \approx BI = w_1 (A_B) + w_2 (SN) \tag{2.1}$$

B = specific behavior

BI = individual's intention to engage in that specific behavior

A_B = individual's attitude toward engaging in that specific behavior

SN = subjective norm regarding that specific behavior

w₁ and *w₂* = relative weights given to components by the individual

Subjective norm explained arithmetically;

$$SN = \sum (NB_j MC_j) \tag{2.2}$$

NB_j = perceived expectation of the j^{th} referent

MC_j = motivation to comply with the j^{th} referent

Attitude towards behavior explained arithmetically;

$$A_B = \Sigma (b_i e_i) \quad (2.3)$$

b_i = the expectation of the i^{th} outcome

e_i = the evaluation of the i^{th} outcome

Consequently;

$$B \approx BI = w_1 (A_B) + w_2 (SN) \quad (2.4)$$

or

$$B \approx BI = w_1(\Sigma (b_i e_i)) + w_2(\Sigma (NB_j MC_j)) \quad (2.5)$$

Although, TRA is a well-established and widely supported theory, there are important concerns regarding its application. First, Ajzen and Fishbein (1980) clearly state the exceptions in which the TRA is not applicable. According to this, TRA is only applicable to volitional situations. In other situations, where the attitude is not under individual's volitional control such as instances where the behavior is forced (Fishbein and Stasson 1990) or where the attitude is toward an object, a person, a channel, or an institution (Ajzen 1985, p. 12, Ajzen and Fishbein 1980, p. 30), TRA cannot be applied.

Bobbitt and Dabholkar (2001) assert variety of contexts such as shopping channels (Maher et al. 1997) or videotext shopping system (Eastlick 1993, Korgaonkar and Moschis 1987), where the focal point of research was attitude toward the channel or the system rather than attitude toward using the channel or the system itself. Bobbitt and Dabholkar (2001) argue the pitfall of this view through the obvious difference between attitudes towards an object and attitudes towards using the object.

Second, although the original theory places emphasis on subjective norm in the formation of behavior, literature has taken a different approach in research. Bobbitt and Dabholkar (2001, p. 428) ignore subjective norm in their study and argue “subjective norm is not a key issue in a theoretical framework focused on attitudinal hierarchy for explaining intentions and behaviors”. Furthermore, literature questions the requisiteness of inclusion of subjective norm in studies where there are no significant social issues involved (Oliver and Bearden 1985). Finally, empirical findings report relatively minimal (Dabholkar 1994, Bagozzi 1981, Warshaw 1980) to no effect (Venkatesh et al. 2003, Davis et al. 1989) of subjective norm on intentions.

Literature review on TRA indicates strong support for relationships between constructs of attitude and intention as well as intention and attitude. Yet, inclusion of subjective norm in attitudinal research demonstrates a decreasing support (Davis and Bagozzi 1989).

2.4.4 Generation of Outputs and Evaluation of Results

Etgar (2008) defines the final stage as the end-result of the activation stage. This final stage considered to be “creation of outputs in terms of benefits”, which customer then uses to evaluate the level of satisfaction to shape further actions (Etgar 2008, p. 105). It is the calculation made by the customer to evaluate if the received benefits, in terms of value, was worth the co-production effort. Naturally, such calculation forms customers’ future attitudes and intentions through the level of satisfaction as the result of the co-production process (Wu et al. 2012, Collier and Sherrell 2010, Eggert and Ulaga 2002).

2.4.4.1 Perceived value

Marketing scholars argue that there is a misconception regarding the use of the terms value (in singular form) and values (in plural form) (De Chernatony et al. 2000, Solomon 1999). According to Boksberger and Melsen (2011, p. 230), while the former stands for “preferential judgment” on an end-state, values in plural form stand for ideologies or beliefs. Therefore, while values are fundamental to macro level decisions such as norms, value in singular form is fundamental to consumer behavior models, usually considered as the output (Boksberger and Melsen 2011).

Boksberger and Melsen (2011) argue there are two main perspectives regarding the conceptualization of perceived value. First is the utilitarian perspective, which is basically the trade-off between the gets and the sacrifices. Utility perspective synonymized with subjective evaluation of money under risk and uncertainty around it (Boksberger and Melsen 2011) or balance between the utility derived from the service and disutility of obtaining such service (Ostrom and Iacobucci 1995) have been criticized for not being able to capture the complexity of perceived value (Monroe 2003). In utilitarian perspective, the calculation of perceived value is dominated by the relative importance of price or cost in the equation. Furthermore, the perception of price is not only directly associated with the perception of the value received but also with other variables such as advertised selling price, advertised reference price and internal reference price (Monroe 2003), or bundled-price (Naylor and Frank 2001). Moreover, the effect of price so overwhelming in such calculation not only the monetary costs but also non-monetary costs strongly dominate perceived value (Cronin et al. 1997)

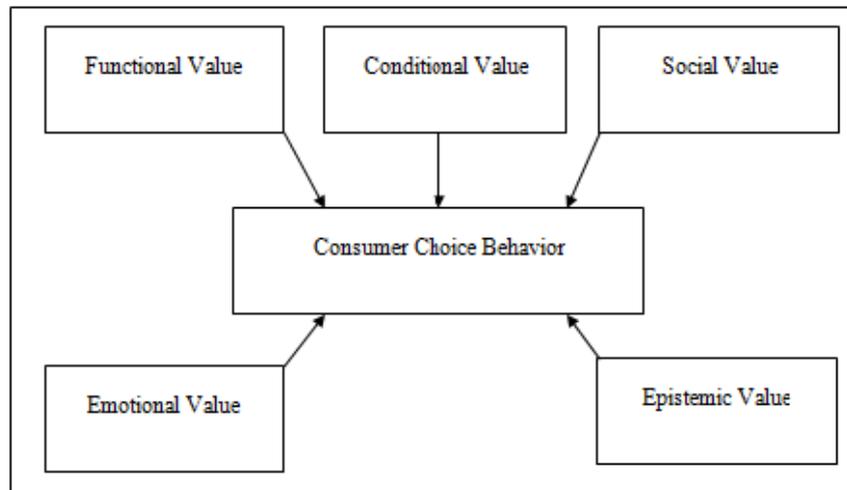
The second perspective, namely the behavioral perspective of perceived value, takes a broader approach in explaining perceived value. Boksberger and Melsen (2011) assert the building block of behavioral perspective is social interaction. In such perspective, customers' evaluation of value goes beyond mere calculation of tangible gets over gives and extends to include "achieving goals and purposed in-use situations" (Woodruff 1997, p. 141).

There are different approaches to identifying various dimensions of behavioral value. For example, Mattsson (1991) explain perceived value through emotional, practical, and logical value. Another widely cited taxonomy of value comes from Holbrook (1999) which is argued to be the most extensive classification of perceived value in literature. Holbrook (1999) defines value in terms of efficiency, quality, success, reputation, fun, beauty, virtue, and faith.

Another comprehensive approach in attempt to explain behavioral value belongs to Sheth et al. (1991) as they define five distinct categories of value that influence consumer choice as presented in Figure 2.6. According to Sheth et al. (1991), though customer choice may depend on any one of the values, it may also depend on all or on combination of the values. (Please note the term "values" is used as the plural form of

value, indicating preferential judgment discussed above, rather than ideologies). The values discussed are functional, social, emotional, epistemic and conditional value.

Figure 2.6: The five values



Source: Jagdish N. Sheth, Bruce I. Newman and Barbara L. Gross, 1991. Why we buy what we buy: a theory of consumption values. *Journal of Business Research*. 22(2), p. 160.

Functional value is the closest proxy to value defined within the boundaries of economic thought which has been identified extensively with price (Marshall 1890). Yet, within the scope of behavioral perspective, the provided definition extends to include not only price but also attributes. Sheth et al. (1991, p. 160) define functional value as “the possession of salient functional, utilitarian or physical attributes”.

Rogers (1995) was one of the first researchers to suggest the importance of social value, beyond symbolic and conspicuous consumption. He argued the increase in the interpersonal communication and rapid dissemination of information caused social value to gain significance in various categories that could not be classified strictly as symbolic (Rogers 1995). Sheth et al. (1991, p. 161) define social value as “association with positively or negatively stereotyped demographic, socioeconomic, and cultural-ethnic groups”. Social value has also been associated with “enhancement of self-image” among social circles (Bearden and Netemeyer 1999).

Emotional value, associated with pure emotions such as fear, happiness, or romance has been considered to be an integral part of intrinsic motivation by Dichter (1947). It has

been defined as the “feeling and affective states” that the offering arouses by Sweeny and Soutar (2001, p. 211) as well as Sheth et al. (1991), and Pura (2005). Emotional value has been argued to be the emotional response the consumers give to offerings, which may come in noncognitive and unconscious form (Sheth et al. 1991).

Epistemic value represents an important area of research since it is considered to be the value derived from new experiences as well as mere variations from the customary or conventional offerings (Sheth et al. 1991). The significance given to achieving competitive advantage through differentiation suggests that the role of epistemic value is bound to increase due to expected augmentation in offerings. Curiosity and appetite for knowledge are the main drivers for epistemic value that will serve as the igniter to explore such augmented offerings (Schmitt and Lahroodi 2008).

Finally, conditional value refers to value that entirely depends on situational factors. Sheth et al. (1991) consider value derived from seasonal offerings as once in a life time events or emergency situations to bare conditional value.

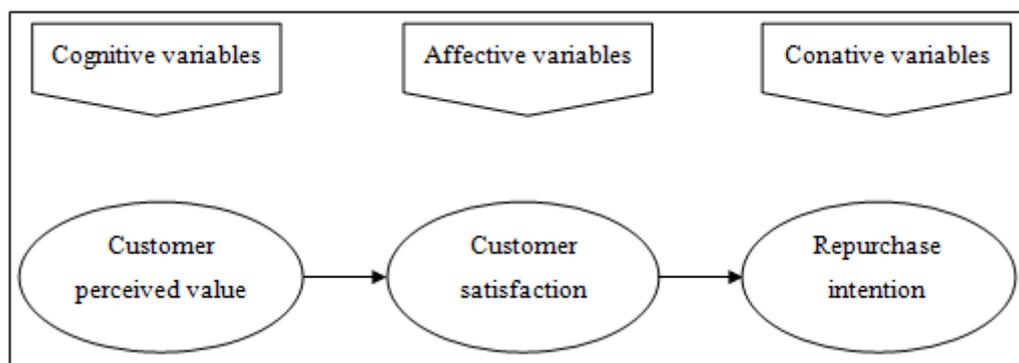
Convenience value is defined as the “ease and speed of achieving a task effectively and conveniently” (Pura 2005, p. 516) has been linked to situations where convenience plays a pivotal role in making or usage of the offering. Accessibility and convenience in terms of proximity, availability, and flexibility have been argued to generate convenience value (Yoon and Kim 2007).

2.4.4.2 Satisfaction and future intention

Satisfaction is accepted to be an indicator of variety of behaviors such as commitment, loyalty, and repurchase intentions (Eggert and Ulaga 2002, Ravald and Grönroos 1996). Defined as “evaluation of an outcome compared to some norm” (Selnes 1998, p. 310), it is argued to be a direct result of disconfirmation theory (Parasuraman et al. 1988). Simply put, expectations are accepted to be benchmarks in comparison to product performances. Confirming state is when the perceived product benefits are equal to expectations. The two far ends of the same continuum are represented by positively disconfirming and negatively disconfirming states. What is suggested by explaining satisfaction through disconfirmation theory is that satisfaction is a truly cognitive construct (Parasuraman et al. 1988). However, Eggert and Ulaga (2002, p. 109) explain

satisfaction “represents an affective state of mind”. Therefore, not only the cognitive but also affective dimensions of value should be taken into consideration when trying to explain outcome behavior. This reasoning seems to corroborate with Fishbein and Ajzen’s (1975) TRA, in which they argue cognitive variables are mediated by affective ones to result in conative outcomes (Eggert and Ulaga 2002). Therefore, as presented in Figure 2.7, satisfaction is a construct in which the subjective evaluation of perceived value is translated into outcome behaviors (Eggert and Ulaga 2002).

Figure 2.7: Interplay between cognitive, affective and conative variables



Source: Andreas Eggert and Wolfgang Ulaga, 2002. Customer perceived value: a substitute for satisfaction in business markets? *Journal of Business & Industrial Marketing*.17 (2/3), p. 113.

Repeat purchase intention, or repurchase intention, studied under attitudinal loyalty is a very familiar construct of marketing literature. Usually generalized as continued interaction, it is defined as the likelihood of repeat and preferential usage of the offering (Shamdasani et al. 2008, Davidow 2003). The research models that bear repeat purchase behavior or continued interaction are generally value-centric models that denote value as the single most important determinant of behavioral intentions (Shamdasani et al. 2008, Grewal et al. 1998). In the case of satisfaction realization through actual use of the offering, positive attitude emerges to further induce repeat patronage behavior. The argued link between satisfaction and repurchase intention has been demonstrated in the research findings of Seiders et al. (2005), Harris and Goode (2004) as well as Brady and Cronin (2001). Although the discussion on satisfaction, through perceived value, leading to future intention is well established in literature (Anderson and Srinivasan 2003, Parasuraman and Grewal 2000, Sweeney et al. 1999), the effect of self-serving bias theory in co-production context deserves future evaluation.

Self-serving bias theory philosophically asserts that while consumers attribute positive results to their own qualities such as abilities, and efforts, they tend to attribute failures to exogenous factors such as other parties, task difficulty, or even bad luck (Bradley 1978, Miller and Ross 1975). Self-serving bias theory inherently suggests people's propensity to credit themselves for success and blame other factors for what they perceive to be a failure (Campbell and Sedikides 1999). Self-serving bias theory has been associated with two different approaches of theorization: motivational theories and information processing theories. The former associates and interprets self-serving bias in motivational terms. Heider (1958) was one of the first scholars to argue individuals' desire to enhance self-esteem through the discussed bias. Weiner (1985) similarly argued that the impact of attributing positive outcomes to personal qualities increased individual's self-esteem. As a result, the positive outcome was indirectly attributed to personal qualities in return causing higher degrees of self-esteem (Bradley 1978). The latter argued that rather than individual differences causing the expected outcome and leading to enhancement of self-esteem, the focal point of self-serving bias lay in perception of the information received. Schroder et al. (1967) argued people with higher cognitive abilities tended to process information in a more complex way enabling causality between information gathered, steps taken, and the outcome achieved. Customers with higher cognitive abilities realized their skills, abilities, knowledge, or any other quality by itself could not be the only source of desired outcome as outcomes rarely based on single factor (Schroder et al. 1967). The midway between the two competing theories is Shaver's (1975) explanation of self-serving bias as he argues that self-serving bias can neither purely be motivational nor be cognitive-based, but a mixture of both effecting each individual to a different degree.

Within the domain of marketing literature, self-serving bias theory has been associated with outcome quality (Campbell and Sedikides 1999). Following Zeithaml et al.'s (1993) outcome dichotomy: better than expected, as expected, and worse than expected, Bendapudi and Leone (2003) conceptualize the case of self-serving bias in co-production context and argue that when the outcome is better than expected in co-production situation, the individual appropriates greater load of the outcome to his/her individual qualities. By the flip side of the same coin, if the outcome of the co-

production process is worse than expected, then one is unlikely to claim same amount of credit for the undesired outcome (Bendapudi and Leone 2003). Unfortunately, literature shows no guidance for instances in which the outcome is as expected in co-production setting. Although self-serving bias theory conceptually fits with co-production phenomenon, as co-production represents a context that the customer has greater responsibility in the outcome which enables them to claim greater responsibility in case of satisfaction, review of the literature produces very few studies trying to establish the argued link (Yen et al. 2004, Bendapudi and Leone 2003).

2.4.4.3 Attitude towards co-creation of value

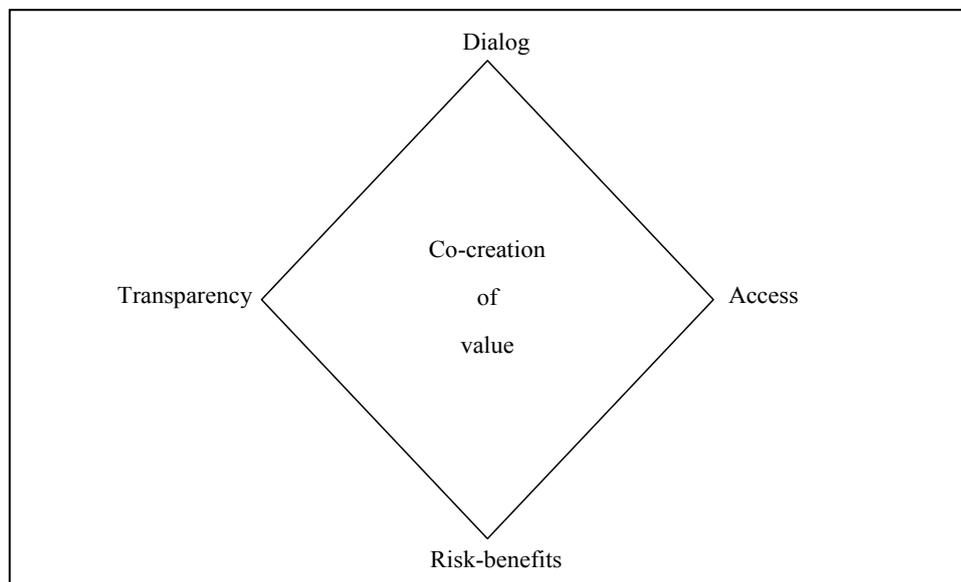
Marketing scholars' interest being limited to exchange phenomenon for so many decades resulted in the conception that marketing was about short-term discrete transactions (Grönroos 2008). However, as one considers the goal of marketing to be creation of value, the exploratory power of such limited transactions become inadequate. Inevitably, exchange takes place; however, what creates the value is not the exchange *per se*, but what the customer can deduce from what has been exchanged. This is the reason why value-in-use is argued to be superordinate to value-in-exchange and value-in-production (Grönroos 2008, Vargo and Lusch 2008a, Lusch and Vargo 2006). Since customer is the prime actor in extracting the value after point of exchange, the company serves as the facilitator of value-in-use. However, in order for the company to act as a facilitator, it has to be invited to the value-in-use stage by the customer. Thus, the main question becomes which companies get invited to be facilitators of value? What is the magic behind being invited to accompany the customers to value extraction stage, after the exchange has been completed?

Recent research on value co-creation has focused on gaining understanding of continued interaction through the value chain. Although interaction has accepted to be main element of value co-creation (Grönroos 2008, Payne et al. 2008), the ways to initiate such interaction remain elusive. Successful co-production experiences contribute to customers' willingness to invite their co-producers to cooperatively extract value with them. Such reasoning fits with the argued position of marketing being a *value creation process* rather than discrete exchange episodes. Similarly, Gummerus (2010, p. 427)

define marketing as a process that companies are engaged in “process oriented value maximizing activities, which the customers actively participate”.

This view suggests that cooperation in use stage is also possible through mutual efforts of the company and the customer to continue the dyadic relationship in order to co-create value. The company’s role at this stage is to provide superior value propositions (Payne et al. 2008) to enrich in-use experience. According to Prahalad and Ramaswamy (2004a), such superior value propositions can only reach customer’s sphere through continuous interaction. They define the building blocks of such interaction through DART Model presented in Figure 2.8.

Figure 2.8: Building blocks of interactions for co-creation of value



Source: C.K. Prahalad and Venkat Ramaswamy, 2004. Co-creation experiences: the next practice in value creation. *Journal of Interactive Marketing*. **18** (3), p. 9.

The DART Model explains that *dialog* is crucial to co-creation of value because markets are “sets of conversations between the customer and the firm” (Prahalad and Ramaswamy 2004b, p. 9). *Transparency* in dialog enables customers to *access* each other’s resources to collaboratively create value; all the while, it assesses the *risk-benefits* of the continued relationship. Thus, the conceptualization of co-creation of value heavily relies on dialog and its specific qualities or expected outcomes (Prahalad and Ramaswamy 2004b). Similarly, Ballantyne (2004, pp. 115) argues dialog to be processer of mutual value creation and defines it as “interactive process of learning

together”. The process of learning together not only generates knowledge *per se* in terms of increased levels of objective information (Nonaka and Takeuchi 1995) but also increases the parties tacit and explicit knowledge levels (Ballantyne 2004).

Dixon (2000) asserts that tacit and explicit knowledge represent the two far ends of the knowledge continuum. Tacit knowledge is defined as the knowledge that “we know below the threshold consciousness, and it often surfaces as skills in action” (Ballantyne 2004, p. 121). Explicit knowledge, on the other hand, is knowledge that the individual has coded to create procedures. Therefore, supporting customer’s value creation processes through providing superior value propositions is a process of facilitating and enriching not only the explicit knowledge of the consumers about the offering but also assisting them to increase and convert tacit knowledge to explicit knowledge (Ballantyne 2004).

Ballantyne and Varey (2006, p. 342) explain the value creation process starts with asking simple questions:

What are my customers trying to do with our goods in use? And what are my customers’ goals and ambitions and how can we contribute? This may seem like a restatement of the conventional first principles of assessing customer needs and wants, however, these probing questions are less abstracted and more grounded in the dynamics of everyday customer experience.

The important point in such discussion is that such questions are no longer self-asked and self-answered by the company, but the answers are sought through continuous dialog between parties (Ballantyne and Varey 2006). This is one important differentiation point between GDL and SDL. In GDL perspective, such question were asked in the hopes of achieving differential advantage whereas in SDL perspective the desired end-stated is to uncover real reasons that are grounded in customers lives, even those that are on subconscious level that can only surface through further probing of the company by superior value propositions (Ballantyne and Varey 2008, Payne et al. 2008, Ballantyne and Varey 2006).

3. CONCEPTUAL FRAMEWORK

The purpose of this study is to delineate the co-production process in self-service technologies (SSTs) and link co-production process consequences to customers' attitude towards co-creation of value as detailed in the first section. Therefore, the literature relevant to co-production, mainly, within the domain of Service Dominant Logic (SDL) has been reviewed in the previous section.

The review of literature revealed that the limited attempts to provide empirical support mainly uses already established constructs, adopting formerly established measurement scales, which have been originally developed to measure related, yet different constructs. Consequently, measurement scales that are unique to the area of investigation are mainly absent. In conclusion, SDL is a pristine area of study in marketing, with potential to encompass hundred years of knowledge to a systemized body, with the capacity of generating a general theory of marketing that is long overdue (Bolton 2006, Vargo and Lusch 2006, Vargo and Lusch 2004a, Vargo and Lusch 2004b).

The aim of this section includes discussion and further elaboration of the theoretical model, in which necessary bridges are formed between SDL and already established research areas and theories within marketing. Through such identifications and associations, not only foundation of the study becomes prevalent, but also constructs for further empirical testing become possible.

Bagozzi and Phillips (1982) argue that every theory starts with conceptual thinking, yet it is regarded incomplete unless it is testable. They further assert both are essential, when one considers contribution to a paradigm (Bagozzi and Phillips 1982). Theories become testable only when they are operationalized, as operational definitions are the vital bridges between conceptual thinking and observable data (Churchill 1991). As discussed previously, the lack of empirical findings within SDL presents both opportunities and challenges for this study. The opportunity presents itself in the form of possibility of contribution to the most promising general theory candidate of

marketing to date, whereas the challenge stands for the researcher in the form of nonexistent footprints to follow in practice.

The impact of discussed lack of empirical findings is manifold. First, paucity of hard data encourages the researcher to excavate even further through literature review, resulting in thorough content analysis of not only SDL literature, but also of literature of other theories in order to apprehend further possible connections to pursue. Second, lack of empirical findings naturally suggests lack of operational definitions and measurement scales. This point already discussed by previous researchers of SDL (Akaka 2007, Randall 2007), usually results in adopting and adapting already established operational definitions and scales to be used in the context of SDL, which often causes problems at the later stages of the research, mainly comprising construct validity. Third, lack of previous research suggests complexity in intuitive decision making. This point not only effects the thought and decision process of primary researcher, forcing her to move forward without well-accepted “rules of thumb”, but also imperials the task of subjective, yet necessary systematic evaluation, this time around jeopardizing content validity. Finally, as it is the case with every paradigm shift, investigating the untouched turf requires extreme training, dedication, concentration, and commitment as, even the language in terms of terminology, may be incomprehensible to those who have relatively less or even no experience of the new area of study.

The above mentioned challenges encourage the researcher to define the aim of the research as tightly as possible, all the while being on alert on acknowledging the opportunities and rooms for adaptation and modification. It mainly accentuates the necessity and importance of thorough literature review that will guide the researcher in the task of conceptualization and operationalization of SDL using well established theories of marketing as a foundation. Such challenges in return pose a subliming opportunity to generate knowledge in an area of study within marketing that is as novel, as crucial.

The aim of this section is to introduce the research model that has been developed in light of the reviewed literature. This section introduces the research model of the study and operationalizes the constructs that constitute the research model. While doing so,

relationships, previously proposed in relevant contexts, have been presented and results have been provided.

3.1 THEORETICAL MODEL AND HYPOTHESIS

The research model proposed in Figure 3.1 is aimed to investigate the process of co-production and its linkage to co-creation of value from customer's perspective. The research model is developed based on literature review on SDL and related theories.

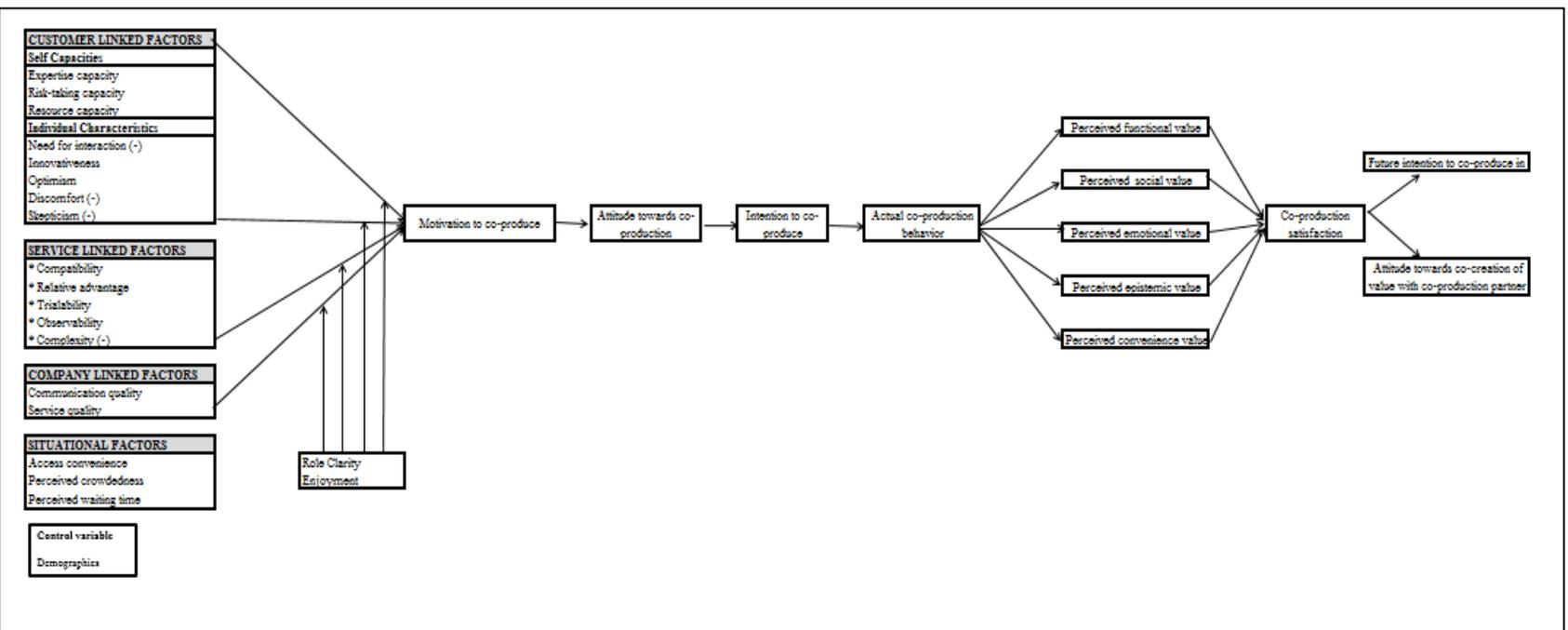
The research model proposed in Figure 3.1 represents co-production process from customer's perspective. Co-production, as pristine area of study, requires focused standpoint in order to become testable. Therefore, a widely accepted example of co-production practice, SSTs will be used as surrogate to test the proposed model (Eastlick et al. 2012, Wu et al. 2012, Collier and Sherrell 2010, Lanseng and Andreassen 2007, Weijters et al. 2007, Pura 2005, Pikkarainen et al. 2004, Dabholkar and Bagozzi 2002, Childers et al. 2001, Meuter 1999).

SSTs are defined as technological interfaces that enable customers to produce and consume services without direct contact with firms' employees (Chen 2005, Meuter et al. 2000). The reason for choosing SST as a surrogate for co-production practice is manifold.

First, the usage of SSTs is expected an increase over 80 percent in the next three years (Anand, 2011). Although not yet confirmed, Kinard et al. (2009) had estimated that by the year 2012, the usage of SST would generate an industry of \$1.7 trillion, in North America alone. Therefore, the increased demand on customers' part is crucial to understand for companies, yet "a unifying consumer theory to understand this form of service is lacking" (Shamdasani et al. 2008, p. 118).

Second, the increased in usage of SSTs does not only count for customers' demands but also tremendous investment made on companies' part in lowering production related costs, creating greater efficiency, forming stronger bonds with their customers through better meeting customer demand and increasing satisfaction, performing tasks more rapidly and consistently and increasing competitive advantage through increasing customer reach, convenience and accessibility (Eastlick et al. 2012, Shamdasani et al.

Figure 3.1: Research model for co-production process and its linkage to co-creation of value in self-service technologies



2008, Liljander et al. 2006, Meuter et al. 2000, Dabholkar 1996). However, neither the investment nor the clear advantages of such technologies automatically lead to customer usage. Therefore, clear understanding of factors that lead to co-production over SSTs from customers' point of view, as well as clear assessment of co-production process itself is crucial for companies that are required to make such immense investment.

Third, SSTs present clear-cut examples of co-production such as automated phone systems, automated teller machines, automated self-check-in and self-check-out interfaces (Eastlick et al. 2012) that give the researcher the opportunity to investigate not only the necessary factors that enable customers to engage in co-production, which has been the major concentration of limited previous research, but also to capture changes in behavioral intentions that may count for both future co-production and possible co-creation practices.

Fourth, the practicality of communicating co-production over an example of SST increases the subjects' comprehension over the complex phenomenon, increasing reliability and validity of the findings.

The research model proposed in Figure 3.1 attempts to construe the descriptive model of co-production process introduced by Etgar (2008), previously presented in Figure 1.1.

The specific context chosen to elaborate co-production in SSTs is online check-in system of an airline company. Online check-in in air travel is an accepted practice of SSTs and provides an excellent opportunity as a surrogate for the proposed model (Gelderman et al. 2011).

3.1.1 Development of Antecedent Conditions

First stage, namely development of antecedent conditions, is defined as prerequisites of customers' willingness to engage in co-production which is divided into four sub-dimensions of:

- a. Customer linked factors,
- b. Service linked factors,
- c. Company linked factors, and
- d. Situational factors.

3.1.1.1 Customer linked factors

Customer linked factors consist of necessary operand and operant resources that are needed to be invested in production on customers' part, named *capacities*. Arnould et al. (2006) assert availability and existence of resources may be used to understand in part why "some consumers are more prone to engage in co-production than others" (Etgar 2008, p. 100). Therefore, customer linked factors aim to investigate the operant and operand resources that the customer needs to bear in order to be invested in the co-production process. As the research model indicates such factors make up the first set of indicators of motivation to co-produce under the rubric of self capacities.

Second set of indicators of motivation to co-produce is individualistic characteristics. While deciding on the individual characteristics, distinctness between individuals that determine motivation in SST setting is a key issue. Following Gadrey et al. (1995), it is argued that co-production is a model of innovation that represents divergence from customary processes. Therefore, the research model proposed houses individual characteristic constructs that are applicable to co-production in SST setting. Put simply, the customers who engage in co-production, adopt a form of product or process innovation and the nature of collaboratively produced product (in Goods Dominant Logic sense) represent another basis as an antecedent condition that effects development of motivations. Individual characteristics defined as differences that determine which customers would be prone to co-production. The individual characteristics will be articulated under the dimensions of need for interaction and four sub-dimensions of Technology Readiness (TR) which are optimism, innovativeness, discomfort and skepticism.

3.1.1.1.1 Self capacities

One of the important contributions of Lusch et al.'s (1992) article was the introduction of different sorts of capacities. Yet, the article failed to provide a definition for "capacity". Similarly, there seems to be a general confusion around the terms competencies, capabilities and capacities. Before advancing to the delineation of customer capacities, it will be orderly to explain the intended meaning for the term capacity. The intended meaning of capacity within this study is level, amount or volume of resource identified. Therefore, while the former two may stand for different sets of operand and operand resources (Madhavaram and Hunt 2008), the latter covers the domain of "amount" or "volume" of resource (Vincent 2008, p. 1).

Expertise capacity

While investigating the exchange phenomenon, Lusch et al. (1992) were the first scholars to conceptualize expertise capacity as the level of skill or knowledge already possessed or the potential to acquire such skill or knowledge. They further proposed that as expertise capacity increased, entities were more likely to engage in internal exchange, which they operationalized as any activity that would compensate or substitute external engagement to create value. The noted examples of internal exchange by Lusch et al. (1992) were do-it-yourself products in home-improvement, self-diagnostic health tests, and tax return preparation, which can all count for examples of co-production within this study.

Before providing definition and justification for expertise capacity for this study, an important distinction needs to be made between two nested constructs regarding experience that are distinct, yet, closely related. Going back to Lusch et al.'s (1992) definition of expertise capacity, it is immediately noticed that they immerse the already acquired knowledge and the potential to acquire knowledge within the same conceptual definition. This view suggests expertise capacity to be a combination of previous experience and the potential previous experience breeds in terms of mental capacities, skills, or knowledge that were previously studied under the rubric of ability (Meuter et al. 2005). Similarly, Etgar (2008, p. 100) defines expertise capacity as customers'

operant resources limited to mental competency and skills related to one's own perception of ability to understand and complete specific task at hand.

Previous experience is a well established and supported construct in marketing literature. Earlier studies have linked previous experience with adoption and continuous use of innovation. Previous experience has also been discussed as a key indicator of early adopters, especially in technology related product classes (Venkatraman 1991, Dickerson and Gentry 1983).

Eastlick et al. (2012) define previous experience as number of times a service has been used to satisfy a need. Earlier research has demonstrated that previous experience serves as surrogate for previous cognitive effort and learning (Dickerson and Gentry 1983) that results in previous systematic acquisition of knowledge on product, product category and product usage (Sharma and Patterson 2000, Mitchell and Dacin 1996). Consequently, as customers' experience level heightens, the perception of lower decision making risk (Heilman et al. 2000) increases the desire to acquire new knowledge to control the service delivery process (O'Connor and Siomkos 1994). Moreover, the customers have clearer understanding of their contribution to the process of production (Auh et al. 2007).

Previous studies that include the construct of previous experience in SST setting have demonstrated its direct effect on different variables. Previous experience has found to have a direct effect on consumer preparedness to use SSTs (Eastlick et al. 2012) and attitude towards SSTs (Reinders et al. 2008, Bobbitt and Dabholkar 2001, Keaveney and Parthasarathy 2001).

Customers' perception of own ability is also a widely used construct in co-production literature in general and SST literature in specific. The most accepted definition of ability is having necessary skills and confidence in order to fulfill a task (Ellen et al. 1991, Globerson and Maggard 1991, Jones 1986). Similarly, Mills and Morris (1986) use ability as the unit of competence. Alternatively, Kotzé and du Plessis (2003, p. 187), relying on the work of Rodie and Kleine (2000), define ability as "all pertinent resources such as knowledge, skill, experience, energy, effort, money or time".

Taking a closer look at Rodie and Kleine's (2000) definition, it is noticed that they consider the root of ability to be resources. Yet, they identify *all* resources (operand and operant) to be abilities. This study agrees with the notion that the basic unit of all abilities is resources, however, it makes the distinction between mental abilities (operant resources) and inactive resources (operand resources). Similar to Meuter et al.'s (2005) argument, this study agrees that expertise capacity is an operant resource that establishes what a person "can do" and strictly separates it from operand resources, which is defined as what a person "has" in order to do (Hall 1993, p.611), which is articulated under the rubric of resource capacity. This distinction is the basic argument between expertise capacity explained here and the resource capacity articulated in the coming sections.

The main discussion around expertise capacity and its antecedent position is that as customers' perceived expertise capacity increases, they will have a better understanding of the making of the process (Moorthy et al. 1997) and will be more motivated to contribute with their operant resources of expertise (O'Connor and Siomkos 1994). Furthermore, it is argued that customers' better assessment on how they can make contributions, combined with their desire to have control over the process (Heilman et al. 2000) will increase the likelihood of customer involvement in co-production.

The argument put forth is supported by Auh et al.'s (2007) findings as they demonstrate expertise to be a strong determinant of co-production behavior in SSTs context. Similarly, Meuter et al. (2005) have concluded that increased experience leads to higher levels of motivation in Internet ordering systems. This study defines expertise capacity as level of skill or knowledge already possessed or the potential to acquire skill and knowledge (Lusch et al. 1992) and argues that as customer's expertise capacity increases, s(he) will have greater motivation to co-produce over SSTs.

H1: Expertise capacity is positively related to co-production motivation in SSTs.

Furthermore, in alignment with Meuter et al. (2005) study findings in which they demonstrate that experience has a positive direct effect on role clarity, it is argued that as customers' experience increases, they will have greater understanding of their role and how they can make a contribution to the process. This finding corroborates with

Biddle's (1986) assessment as he argues that customer roles develop over time. As customers' previous experience increases, the uncertainty around their role clarity will be decreased. Therefore, it is argued that previous experience will have a positive effect on role clarity of the customers.

H2: Expertise capacity is positively related to role clarity in SSTs.

Risk-taking capacity

Risk is a widely studied construct within marketing literature defined as compromises between the desire to succeed and the desire to avoid failure (Lopes 1987), uncertainty of consequences (Campbell and Goodstein 2001, Dowling 1986) and a combination of the severity of an outcome and the probability of that outcome occurring (Mandel 2003). Mayer et al. (1995) differentiate risk taking from the widely studied construct of perceived risk that is identified with trust. Risk-taking capacity differs from perceived risk associated with trust because it occurs in a context specific and identifiable relationships with the other party (Mayer et al. 1995). Assessing such risk-taking includes the specific context or situation (Coleman 1990). Lusch et al. (2007) assert co-production as such specific context that require risk-taking, yet this does not suggest that co-production is a risk intensifier. However, a customer's degree of risk absorption determines his/her capacity in co-production motivation. Respectively, risk-taking capacity is about the level of customer's risk absorption rather than the actual level or type of risk involved (Kaplan and Szybillo 1974).

Co-production in SSTs serving as the surrogate for the specific context or situation argued above, risk-taking capacity in this model is used to explain the eagerness to compromise the capacities used to produce the desired outcome and the likelihood of expected outcome to occur. Therefore, risk-taking capacity represents the degree of tolerance for uncertainty in co-production consequences. Respectively, it is hypothesized that as customer's risk-taking capacity increases, s/he will have greater motivation to invest in co-production with his/her resources.

H3: Risk-taking capacity is positively related to co-production motivation in SSTs.

Resource capacity

One of the ten foundational premises (FP) of SDL (FP9) states “All social and economic actors are resource integrators” (Vargo and Lusch 2008, p. 7). Regardless of the distinction between operand and operant resources, literature defines customer resource capacity as the resources that can be integrated to company processes (Moeller 2008) or the totality of resources, “which the customer has vis-à-vis to the total offering” (Payne et al. 2008, p. 86).

Depending on the context, co-production may require integration of operand resources (Reckwitz 2002) such as tools, materials, physical space, or funds as well as operant resources such as time or physical effort (Xie et al. 2008).

Unarguably, SDL is found on the distinction between operant and operand resources (Vargo and Lusch 2004a). Although operant resources are given higher priority in the equation of co-production, the importance of operand resources in the making of the offering is apparent. Put simply, individuals need operand resources to employ their mental capacities, skills, and knowledge on. Yet, to the best of the researcher’s knowledge, there are no previous studies that have investigated the effect of operand resources in co-production context.

Following Lusch et al. (1992) footprints, this study regards resource capacity as the level of operand resources the customer needs to bear in order to be invested in co-production process. Consequently, resource capacity is defined as variety and totality of customer resources, besides expertise, skills, and knowledge that will be invested in co-production process and it is argued that increased resource capacity will have positive effect on co-production motivation.

H4: Resource capacity is positively related to co-production motivation in SSTs.

3.1.1.1.2 Individual characteristics

The personalized idiosyncrasies form our preferences (Lin and Hsieh 2006). Consequently, differences among customers on an individual level shape their views on collaboration process they are about to embark with their production partners.

Individual characteristics include their need for interaction and their evaluations on readiness towards technology during the service provision.

Need for interaction

Services are inherently based on personal interaction. However, the increased usage of information and communication technology has been argued to decrease the amount and the nature of such interaction which leads to adoption of new behaviors on customers' part (Gelderman et al. 2011). However, not all customers have adapted to such change in a favorable way (Lee and Allaway 2002). Cowles and Crosby (1990), Bateson (1985) and Langeard et al. (1981) have asserted that human interaction is crucial to some customers regardless of the technological advancements since they consider the interaction as an integral part of service experience.

Dabholkar (1996) defines need for interaction as the desire to participate in interpersonal relationship with the service employee during service provision. Naturally, customers with high need for interaction tend to avoid SSTs due to high levels of desire for interpersonal relationship. Moreover, literature ties high need of interaction with the need to avoid machines (Dabholkar and Bagozzi 2002). Forman and Sriram (1991) have found a positive relationship between high need for interaction and need to avoid machines in retail setting.

The previous findings on the construct 'need for interaction' on SST setting are limited and contradictory. While Meuter et al. (2005) demonstrated need for interaction had negative impact on SST usage motivation, Eastlick et al. (2012) concluded there was no significant relationship between the two constructs. Gelderman et al. (2011) reported a negative relationship between need for interaction and SST usage. Gelderman et al.'s (2011) findings corroborate with Reinders et al.'s (2002) and Dabholkar and Bagozzi's (2002) findings in SSTs setting.

This study defines need for interaction as the importance of human interaction to customer during service encounter. In line with conceptual reasoning and empirical findings of negative relationship demonstrated above, it has been argued that customers' increased desire for human interaction will negatively affect their motivation to co-produce through SSTs.

H5: Need for interaction is negatively related to co-production motivation in SSTs.

Technology readiness

One of the distinct characteristics of SSTs is its technological nature. Given the increasing role of technology in modern life, technology related constructs are not new to marketing literature.

Marketing literature marks technology readiness (TR) (Parasuraman 2000) as a widely cited and supported construct that has the power to capture different dimensions of drivers and inhibitors of technology alike. TR is a multi-dimensional construct defined as “people’s propensity to embrace and use new technologies for accomplishing goals in home life and at work” (Parasuraman 2000, p. 308). It is the “mental enablers and inhibitors” that define customer’s motivations and consequently attitude towards technology (Parasuraman 2000, p. 308). TR is a broad and multi-dimensional construct with four dimensions of innovativeness, optimism, discomfort, and insecurity (Parasuraman 2000).

There have been limited empirical findings linking TR to innovation adoption. Moreover, the findings demonstrate contradictory results. Rather than differentiating between four subdimensions of TR, Liljander et al. (2006) and Lin and Hsieh (2006) have used TR as an overall construct and reported TR to be positively related to attitude in SSTs setting. Liljander et al.’s (2006) study demonstrated that individual dimensions’ relation to attitude was inconclusive. Kim et al. (2010) demonstrated support for the relationship between innovativeness and attitude towards novel media usage in retail setting. Moreover, while Gelderman et al. (2006) asserted innovativeness’ and optimism’s positive association with attitude, they found insecurity and discomfort dimensions to have high inter-correlations and suggested a combined construct of the two separate dimensions.

Regardless of the previous findings, there are three reasons for including TR as proposed by Parasuraman (2000) in this study. First, the conceptual foundation of TR in general and the operationalization of the separate constructs show accordance with the aim and the phenomena that is under investigation in this study. Second, the evaluation of alternative empirical studies that investigate individual characteristics related to

technology tend to cover limited aspects of the TR, mainly, concentrating on anxiety under the rubric of technology anxiety, similar to dimensions of insecurity and discomfort of TR, and leaving optimism and innovativeness dimensions out (Meuter et al. 2005, Meuter et al. 2000). Third, investigation of previous empirical studies reveals that in all of them, TR has been directly linked to customer's attitudes, without taking into consideration of the effect of moderating factors. Respectively, this study alternatively suggests the relationship between TR and generation of co-production motivation requires further investigation.

Innovativeness

In traditional sense, customer innovativeness is predisposition to search for and buy new products and/or brands (Hirschman 1980). It is the preference for the novelty (Venkatraman 1991) with the goal of being a technologically pioneering thought leader (Parasuraman 2000).

Empirical studies measuring general innovativeness have been reported to be associated with adoption of innovations (Gelderman et al. 2011, Liljander et al. 2006, Goldsmith et al. 1998). Furthermore, domain specific innovativeness has been identified with self-discovery and self-guided exploration and has been associated with novelty/uniqueness (Kim et al. 2010).

This study regards innovativeness as tendency and desire for different experiences through technological pioneering (Parasuraman 2000, Venkatraman 1991) and argues SSTs can serve as a surrogate for such innovative customers with predisposition to be leaders by technological means.

H6: Innovativeness is positively related to co-production motivation in SSTs.

Optimism

The second driver of mental enablers is optimism. Parasuraman (2000, p. 311) defines optimism as "positive view of technology and belief that it offers people increased control, flexibility, and efficiency in their lives". It has been further suggested that a strong indicator of technology usage lies on customers' perception of convenience and control (Zeithaml et al. 2000). Previous findings assert a relationship between optimism

both with attitude towards and actual use of SSTs (Gelderman et al. 2011, Liljander et al. 2006).

This study, in line with Parasuraman's (2000) conceptualization, argues that customers' propensity towards SSTs needs to be evaluated on a continuum represented by the interplay between the whole set of drivers and inhibitors and optimism, together with innovativeness, play a crucial role in shaping customers' favorable attitude towards co-producing by technological means.

H7: Optimism is positively related to co-production motivation in SSTs.

Discomfort

Earlier work investigating the notion of discomfort related to technology is studied under the rubric of computer anxiety (Kay 1993, Ray and Minch 1990, Igarria and Parasuraman 1989, Cambre and Cook 1985) which is defined as "the fear, apprehension and hope people feel when considering use or actually using computer technology" (Meuter et al. 2003). Doronina (1995) finds evidence for computer anxiety's effect on avoiding computers and attempting to reduce amount of time using computers.

Studies following 1990s address broader aspect of technology anxiety and interpret discomfort as an antecedent of innovation adoption and accept such technologies to be product or process innovations as argued in previous sections of this study. These works concentrate on adopting Internet (Morris and Turner 2001, Lederer et al. 2000), e-commerce (Reibstein 2002), handheld devices (Bruner and Kumar 2005), online banking (Curran et al. 2003), and SST in general (Gelderman 2011, Meuter et al. 2005, Meuter et al. 2003); all are related to TR and demonstrate a negative relationship between discomfort and attitude to use SST.

In line with Parasuraman (2000), this study defines discomfort as customers' feeling of lack of control and feeling of overwhelm with the use of SSTs and argues that customers with higher degrees of discomfort will be less motivated to co-produce over SSTs.

H8: Discomfort is negatively related to co-production motivation in SSTs.

Skepticism

The second indicator of mental inhibitors is insecurity, defined as “distrust of technology and skepticism about its ability to work properly” (Parasuraman 2000, p. 311). Although, this study agrees with the operational definition of the construct and relying on previous findings argues that it will have a negative relationship with co-production motivation in SSTs, it disagrees with the original labeling of the construct. According to the researcher, the label insecurity does not capture the essence the intended meaning. Thus, the construct representing second set of mental inhibitors in TR is labeled as skepticism.

The difference between two dimensions of mental inhibitors, discomfort and skepticism, is noteworthy. While discomfort is directed towards assessment of individuals’ own abilities and willingness, skepticism explores the assessment of attitudes towards technology itself and its reliability. Therefore, it is argued that not only one’s own abilities related to technological means, but also one’s comfort and contentment in technology in general is argued to be a strong indicator of TR.

Skepticism (originally labelled as insecurity) as a dimension within TR has been previously hypothesized to have a negative relationship with attitude and use of SSTs (Liljander et al. 2006, Lin and Hsieh 2006). Yet, skepticism as a separate dimension has not been demonstrated as a predictor of motivation before. Furthermore, skepticism has been investigated as an antecedent of perceived ease of use and perceived usefulness (Walczuch et al. 2007). The results demonstrated that individuals with higher degrees of skepticism perceived lower degrees of usefulness and lower degrees of ease of use regarding the technology. Although the dimension of skepticism has failed to form a unique dimension in previous studies before (Gelderman et al. 2011, Liljander et al. 2006), the conceptual foundation of the construct agrees with the phenomenon under investigation for this study. Thus, this study argues that as the level of customers’ skepticism increases they will be less motivated to co-produce over SSTs.

H9: Skepticism is negatively related to co-production motivation in SSTs.

3.1.1.2 Service linked factors

This research stems from the doctrines of SDL and holds true to its FPs. Therefore, in line with FP1; “service is the fundamental basis of exchange”, FP3; “goods are distribution mechanism for service provision”, and FP5; “all economies are service economies” (Vargo and Lusch 2008a), this study suggests the notion of product linked factors contradicts this study’s central tenet and replaces it with service linked factors. It also argues that service linked factors will vary enormously and depend largely on the nature of the specific service under question for each study. Therefore, what is needed is to find common grounds for different service provisions that may be used as service linked factors. Therefore, it utilizes innovation characteristics, proposed by Rogers (1995), in order to investigate service specific factors stemming from the innovated nature of the service or the process of co-production. The reasoning behind this proposition is well embedded in literature.

Co-production defined as customers’ involvement in production stage with the commitment of resources suggests a major divergence from customers’ customary practices (Etgar 2008). In other words, the qualities of the service need to bear specific characteristics for customers to assume responsibility and such characteristics are presented through four dimensions of innovation characteristics (Rogers 1995), which are

- a. Compatibility,
- b. Relative advantage,
- c. Complexity, and
- d. Trialability.

3.1.1.2.1 *Compatibility*

Compatibility, defined as the degree which the innovation is perceived as being in-line with existing values, needs, and past experiences of customers, has been argued to have positive relation with co-production motivation. This reasoning is consistent with previous empirical findings in SST context. Meuter et al. (2005) have demonstrated that compatibility was positively related to innovation adoption. Liao and Lu’s (2008) findings echoed Meuter et al.’s (2005) results as they demonstrated that compatibility

has a direct positive effect on intention to use SSTs. Similarly, Eastlick et al. (2012) presented along with relative advantage, compatibility was the antecedent with strongest impact on extrinsic motivation to use SSTs. Thus, this study argues a positive relationship between SSTs' compatibility with individual's life as well as past experiences and his/her motivation to co-produce over SSTs.

H10: Compatibility is positively related to co-production motivation in SSTs.

3.1.1.2.2 *Relative advantage*

The second dimension of innovation characteristics is relative advantage. It is defined as "the degree which an innovation is perceived better than the idea it supersedes" (Rogers 2002, p. 990), which fits well with the intended meaning of service linked factors since from philosophical stance, the customers seek some sort of relative advantage to diverge from full service offerings. Previous empirical findings support such reasoning to assert there is a positive relationship between perceived relative advantage and attitude towards SSTs (Weijters et al. 2007, Chen et al. 2002, Dabholkar and Bagozzi 2002, Eastlick 1996). In line with previous findings, this study argues that as customers' who perceive higher degrees of relative advantage from the SST options will have greater motivation to co-produce over them.

H11: Relative advantage is positively related to co-production motivation in SSTs.

3.1.1.2.3 *Complexity*

Rogers (2002, p. 990) defines complexity as "the degree to which an innovation is perceived as difficult to understand and use". Complexity has been used in the previous studies of Eastlick and Lotz (1999) in relation with attitude towards e-shopping, and the findings supported the hypothesized negative relationship. On the other hand, Meuter et al. (2005) demonstrated that the relationship between complexity and trial in SSTs setting was insignificant. Simon and Usunier (2007) also investigated the role of complexity in SSTs and reported that customers' preference to use SSTs depended on complexity of the service. As the complexity of the service decreased, customers showed higher degrees of preference to use SSTs. In line with Simon and Usunier's

(2007) findings, this study also proposes that as SSTs' degree of complexity increases, the individuals will be less motivated to co-produce over SSTs.

H12: Complexity is negatively related to co-production motivation in SSTs.

3.1.1.2.4 Trialability and Observability

The remaining two constructs trialability and observability are the two least commonly used constructs in marketing literature within the domain of SSTs. Of the studies which have included the constructs, Meuter et al. (2005) reported a weak relationship between trialability and SST adoption, and the relationship between observability and SST adoption was not supported. Similarly, Liao and Lu (2008) found no significant relationship between both constructs and attitude on e-learning setting.

However, this study includes all five dimensions in the research model since no previous study has investigated the relationship between such dimensions and motivation. From the operational point of view, this study defines trialability as “the degree to which an innovation may be experimented on limited basis” and observability as “the degree to which the results of the innovation is visible to others” (Rogers 2002, p. 990). Furthermore, it argues that customers will be more prone to choose SSTs over full service options, given that they are able to try it out beforehand. Similarly, it is further argued that the visibility of results will motivate the customers to use SSTs in order to complete the task at hand.

H13: Trialability is positively related to co-production motivation in SSTs.

H14: Observability is positively related to co-production motivation in SSTs.

3.1.1.3 Company Linked Factors

The company linked factors are the last leg of the previously introduced SDL trivet. It stands for factors effecting customers' evaluations on differentiating between companies which they will become co-production partners with.

3.1.1.3.1 Communication quality

Co-production being a novel area of partnership, this study argues that communication quality presents crucial input on company's part to ignite and develop cooperation on production.

Communication quality has been found as an important determinant in buyer-seller relationships (Mohr and Spekman 1994). Previous studies have argued communication quality to be an integral part of relationship quality and demonstrated its impact on satisfaction (Palmatier et al.2006).

The limited previous empirical findings on communication quality in co-production context report mixed results. While Auh et al. (2007) found a positive relationship between communication and actual co-production, Wu et al. (2012) established that communication quality has no impact on co-production satisfaction.

Contradictory and limited findings on communication quality in co-production context present an opportunity for this study. Furthermore, the operationalization of the construct, philosophically, suggests that as quality of the company's communication efforts increase, customers will have greater motivation to co-produce. This study defines communication quality in line with Auh et al.'s (2007, pp. 361-362) definition of "the formal and informal sharing of meaningful and timely information" and hypothesizes a positive relationship between communication quality and motivation to co-produce in SSTs setting.

H15: Communication quality is positively related to co-production motivation in SSTs.

3.1.1.3.2 Service quality

Service quality is a widely used factor in the quest of explaining collaboration between the customer and the company. The reason for the frequent usage of different dimension of service quality lies on the premise that as customers take part in SSTs, they have a front seat view of the quality of service that the company provides.

The interesting aspect of all studies related to services quality in customer participation is that relatively limited number of them adopt all five dimension of SERVQUAL (Parasuraman et al. 1988), usually dropping a different dimension each time.

Claycomb et al. (2001), utilizing assurance, empathy, and responsiveness, find support for assurance and empathy's positive relation to customer participation, yet reports no significant relationship between responsiveness and cooperative production. Similarly, Shamdasani et al. (2008) use reliability in conjunction with speed, ease of use, enjoyment, and control as antecedents of service quality in SSTs settings and support all determinants but ease of use to be related to service quality.

Alternatively, Wu et al. (2012), utilizing all five dimensions in co-production context as Evans et al. (2008) do, report that all five dimensions to be strong indicators of customer participation. Whereas Cheung and To (2011) find co-production to be positively related to all four dimensions except responsiveness.

In accordance with definitions provided by Parasuraman et al. (1988, p. 23), this study includes the five distinct dimensions of service quality and defines them as tangibles-“physical facilities, equipment, and appearance of personnel”; reliability-“ability to perform the promised service dependably and accurately”; responsiveness-“willingness to help customers and provide prompt service”; assurance-“knowledge and courtesy of employees and their ability to inspire trust and confidence” and empathy-“caring, individualized attention the firm provides its customers”. In doing so, perceptions dimension of the SERVQUAL (Parasuraman et al. 1988) is included within the boundaries of the scale since the aim is not to measure the gap between the expectations and perceptions but to measure perceived service quality's effect on the co-production motivation.

Relying on the solid premise that customers use the dimension of service quality to assess the quality of the newly formed collaboration and dimensions of innovative offering, this study hypothesizes a positive relationship between service quality and co-production motivation.

H16: Perceived service quality is positively related to co-production motivation in SSTs.

3.1.1.4 Situational factors

Situational factors are included in this study through the argument of Social Cognitive Theory (SCT) (Gelderman et al. 2011). SCT asserts relying solely on individual differences to explain variation in behavior is inadequate because behavior is also effected by situational factors. Therefore, this study utilizes variety of situational factors that have been established in SSTs literature that effect customer behavior. These factors are access convenience, perceived waiting time, and perceived crowdedness.

3.1.1.4.1 Access convenience

Most services are inseparable. Inseparability means that customers must synchronize their routines with the routines of the service provider. They must meet firms' operating hours, and they must travel to certain locations to literally receive the service. Put simply, they must be present at the convenience of the company. One of the major reasons for SSTs to gain acceptance is the freedom it offers to customers from this company centric view. Berry et al. (2002, p. 7) argue that "self-services reduce consumers' dependence on service providers, whose accessibility may be inconvenient". This view is line with Wikström's (1996, p. 9) point of view on value-creation as he argues that value creation is an act supporting customers in "lower costs, better quality, better fit, greater speed, and greater convenience". Therefore, as customers' perception of access convenience increases, it is argued to have a positive effect on co-production motivation.

Jones and colleagues (2003) provided empirical support of the proposed relationship between location convenience and satisfaction, as well as repurchase intention. Similarly, the results of Geissler et al.'s (2006) study verified that access convenience is a key issue in service setting as they defined perceptions of access convenience with hours of operation and location. As it is the case with most understudied phenomena, Wu et al. (2012) reported contradictory findings for location convenience as they found insignificant relationship between location convenience and repurchase intention in satisfactory co-production relationships.

Relying on the conceptual foundations of Berry et al.'s (2002) work, this study defines access convenience as convenience in the offering in terms of time and effort and proposes that access convenience has a positive impact on co-production motivation.

H17: Access convenience is positively related to co-production motivation.

3.1.1.4.2 Perceived waiting time

According to Dabholkar and Bagozzi (2002, p. 196) perceived waiting time is an important determinant that directs customers to SST options as they argue:

Consumers choose to use technology-based self-service when faced with waits or delays. The attenuation of the attitude intention relationship suggests that with increased waiting time, consumers will select alternative options despite favorable attitudes toward the technology-based self-service. Thus, waiting time is a strong deterrent to the use of on-site technology-based self-service.

Yet, the effect of perceived waiting time in SSTs research is an under investigated phenomenon. Previous research regarding wait time has concentrated on its effect on perception of the service quality (Pruyn and Smidts 1998, Tom and Lucey 1995).

On one of the very rare studies that used perceived time in relation with satisfaction, Weijters et al. (2007) demonstrated its negative effect on satisfaction. Similarly, Dabholkar and Bagozzi (2002) reported that increased perceived time was a determinant to use SSTs options.

In line with the conceptual reasoning above, this study regards perceived waiting time as a situational factor that will encourage customers to use SST options and hypothesizes a positive relationship between perceived waiting time and co-production motivation.

H18: Perceived waiting time is positively related to co-production motivation.

3.1.1.4.3 Perceived crowdedness

Perceived crowdedness represents an opportunity for this study in the sense that it is a very rarely used construct in SSTs research, limited to a single study (Gelderman et al. 2011), regardless of its conceptual fit with the phenomenon under investigation. Respectively, Gelderman et al. (2011) demonstrated the time-saving advantage of

SSTs combined with perceived social anxiety as a result of overcrowded service settings (Dabholkar and Bagozzi 2002, Machleit et al. 2000) encourage customers to head towards SST options. Their findings support the positive relationship between perceived crowdedness and customers' decision to use SSTs.

This study defines perceived crowdedness as negative subjective experience of certain density levels and argues that as the perceived crowdedness in the full service setting increases, customers will be more motivated to use SSTs to receive the service. Such situational circumstance will result in increased customer motivation to co-produce in SSTs.

H19: Perceived crowdedness is positively related to co-production motivation in SSTs.

3.1.2 Development of Motivations

Second stage, namely development of motivations, consists of moderating factors of role clarity and enjoyment, which are argued to provide a broadened understanding of why customers would prefer SSTs over traditional full-service offerings.

3.1.2.1 Importance of moderating factors

Widely cited authors Baron and Kenny (1986), who heavily work on intermediary processes, assert that although the functions of third variables are widely established in literature, it is not uncommon for scholars or researchers to use the terms mediator and moderator interchangeably. Therefore, even though this study may present theoretical reasoning for the causal linkages between the antecedent conditions, intermediary processes, and consequences, it must first establish the justification for moderation of the proposed constructs.

Moderators, just as mediators, are used to refine and understand causal relationships. The most straightforward argument against this statement is that this study, being a cross-sectional and non-experimental one, is not a causal study by definition to begin with. Yet, Rose et al. (2004) explain models that bear mediators and/or moderators are causal by nature because "underlying theories suggest directional inferences that are intrinsically causal" (Wu and Zumbo 2008, p. 368). Therefore, the starting point for both

variables is their inherent nature of causality that enhances and refines the causal relationship between the dependent and independent variable(s).

Moderation is a causal model that explains the “when” and the “from whom” of the causal effect theorized (Frazier et al. 2004, Baron and Kenny 1986). Alternatively stated, “a moderator specifies the conditions under which a given effect occurs, as well as, the conditions under which the direction or strength of an effect vary” (Holmbeck 1997, p. 599). This explanation is in line with Rose et al. (2004) as they argue moderator is the variable that modifies the strength and direction of the proposed causal link. The simplest analogy that describes the process of moderation is Wu and Zumbo’s (2008, p. 370) dimmer analogy. According to them, the moderator is the dimmer that adjusts the brightness of the lighting which represents the strength of link between variables.

Co-production literature in general, SST literature in specific, provide rare examples of studies where different variables have been proposed to moderate relationships. Therefore, the theory, as limited as it may be, encourages the researcher to theorize on moderation. Yet, perhaps more importantly, another reason for inclusion of moderating variables in this study is the previous contradictory findings of co-production, SSTs and innovation adoption literature. Empirical studies that have utilized similar constructs in order to investigate the co-production phenomenon, reported findings that seem to be inconclusive and discordant with one another, which prevents future theory generation. Therefore, it has been proposed that inclusion of moderating factors may serve to clarify previous contradictory results and generate knowledge that may be used as foundation for future development.

3.1.2.2 Moderating variables

Role clarity and enjoyment are articulated below and their inclusion is explained as moderating variables.

Role clarity

Motivation literature proposes as customers understand their role in a situation, they are more likely to internalize behavior. By doing so, they engage in behavior or perform the

activity less and less to comply with external forces but more and more for inherent satisfaction (Ryan and Deci 2000a).

In a typical full-service incident, a customer's role may not stretch beyond duty of being present. However, in the case of co-production, customers become "partial employees" (Larsson and Bowen 1989, Bateson 1985, Mills et al. 1983) by integrating their resources with the resources of the firm, and by supplying labor and knowledge (Hsieh et al. 2004). Just as it is the case with any employee regardless of the cruciality of the task performed, customers can partake in production to the extent that they understand the role or the function they are expected to fulfill.

It has been proposed that in order to enable customer engagement in co-production, customers must bear certain abilities to fulfill their role (Globerson and Maggard 1991), explained under the rubric of customer linked factors. Yet, the company must also educate their customers on the role they are expected to play (Wu et al. 2012, Lovelock and Young 1979) in order for them to grasp true understanding of their role. It is through role clarity that the customers can play their part effectively (Larsson and Bowen 1989), and through true fulfillment of role they are expected to play, they move towards integration rather than amotivation (Ryan and Deci 2000a).

In co-production literature, role clarity has been proposed and empirically tested as both an antecedent condition (Gelderman et al. 2011, Kotzé et al. 2003 -conceptually proposed) and as mediating variable (Eastlick et al. 2012, Meuter et al. 2005, Meuter 1999) in relation to adoption, participation, and motivation towards co-production. All empirical findings suggest role clarity's overwhelming effect on consequence variable proposed.

Yet, from philosophical point of view, role clarity cannot be categorized as an antecedent variable since its existence relies on previous acquisition of operant resources such as knowledge (Meuter et al. 2005). In other words, there are two essential elements for an individual to be clear on the role s(he) is supposed to play. First, the individual must bear certain degrees of expertise (operant resource) to understand "the role". Second, the role must be communicated by the source (Globerson and Maggard 1991). Only then the customer's degree of role clarity will moderate the

relationship between antecedent conditions and the dependent variable, such as motivation, attitude, or use.

Defined as customers' understanding on what is expected of them during the performing of the service provision, it has been proposed that once the customer has clear understanding of his/her role, such role clarity will serve as the dimmer (Wu and Zumbo, 2008) between antecedent conditions and co-production motivation.

H20a: Role clarity strengthens the positive relationship between expertise capacity and co-production motivation in SSTs.

H20b: Role clarity strengthens the positive relationship between risk-taking capacity and co-production motivation in SSTs.

H20c: Role clarity strengthens the positive relationship between resource capacity and co-production motivation in SSTs.

H20d: Role clarity attenuates the negative relationship between need for interaction and co-production motivation in SSTs.

H20e: Role clarity strengthens the positive relationship between innovativeness and co-production motivation in SSTs.

H20f: Role clarity strengthens the positive relationship between optimism and co-production motivation in SSTs.

H20g: Role clarity attenuates the negative relationship between discomfort and co-production motivation in SSTs.

H20h: Role clarity attenuates the negative relationship between skepticism and co-production motivation in SSTs.

H20i: Role clarity strengthens the positive relationship between compatibility and co-production motivation in SSTs.

H20j: Role clarity strengthens the positive relationship between relative advantage and co-production motivation in SSTs.

H20k: Role clarity attenuates the negative relationship between complexity and co-production motivation in SSTs.

H20l: Role clarity strengthens the positive relationship between trialability and co-production motivation in SSTs.

H20m: Role clarity strengthens the positive relationship between observability and co-production motivation in SSTs.

H20n: Role clarity strengthens the positive relationship between communication quality and co-production motivation in SSTs.

H20o: Role clarity strengthens the positive relationship between service quality and co-production motivation in SSTs.

H20p: Role clarity strengthens the positive relationship between access convenience and co-production motivation in SSTs.

H20q: Role clarity strengthens the positive relationship between perceived crowdedness and co-production motivation in SSTs.

H20r: Role clarity strengthens the positive relationship between perceived waiting time and co-production motivation in SSTs.

Enjoyment

Marketing scholars argue regardless of the degree of involvement, both utilitarian and hedonic elements of performing the behavior should be taken into account (Weijters et al. 2007). Similarly, although usage of SSTs is considered to be a high-involvement situation, the hedonic aspect of usage under the rubric of enjoyment is common in literature (Dabholkar et al. 2003, Dabholkar and Bagozzi 2002, Childers et al. 2001).

Enjoyment and fun are used interchangeably in marketing literature, usually as the surrogate of intrinsic motivation and defined as “the extent to which performing [the behavior] is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated” (Davis et al. 1989, p. 1113). While the utilitarian aspect of performing the behavior or completing the task will always be more salient in

high-involvement situations, Bauer et al. (2006) have argued that hedonic aspect of any situation cannot be overlooked, which have been conceptually established and empirically demonstrated in marketing literature (Dabholkar and Bagozzi 2002, Childers et al. 2001). Furthermore, Franke and Schreier (2010, p. 1023) assert, even in cases where the behavior to be performed requires certain effort, individuals perceive certain degrees of enjoyment because effort and enjoyment are “conceptually independent”.

In the most general sense, consumer behavior literature uses the dichotomy that describes the consumers either as problem-solvers or fun, arousal, and enjoyment seekers (Hirschman and Holbrook 1982). The extension of this dichotomy in motivation literature is the difference between extrinsic motivation, alternatively, referred to as utilitarian motivation, which is defined as “the drive to perform a behavior to achieve specific goals/rewards” (Venkatesh 2000, p. 348), and intrinsic motivation, alternatively, referred to as hedonic motivation, which is defined as “the pleasure and inherent satisfaction derived from specific activity” (Venkatesh 1999, p. 240). However, Babin et al. (1994) explain the types in motivation cannot be treated as mutually exclusive as they are inherently inclusive to some degree depending on the context.

This study defines enjoyment in line with the definition provided by Davis et al. (1992, 1989) as the extent to which using SST is enjoyable in its own right. In SSTs setting, enjoyment is widely studied construct. Although Franke and Schreier (2010) argue that high effort needed from consumers’ part would automatically suggest low enjoyment, the empirical findings suggest otherwise. Igarria et al. (1995) and Davis et al. (1992) report enjoyment is a strong indicator of use of technology and technology adoption. Furthermore, Weijters et al. (2007), Dabholkar et al. (2003), Dabholkar and Bagozzi (2002), Childers et al. (2001) demonstrate the positive effect of enjoyment on attitude towards SSTs.

In light of previous conceptual reasoning and previous empirical findings, this study suggests that enjoyment serves as an inducer in co-production motivation, and as the moderator between antecedent conditions and co-production motivation.

H21a: Enjoyment strengthens the positive relationship between expertise capacity and co-production motivation in SSTs.

H21b: Enjoyment strengthens the positive relationship between risk-taking capacity and co-production motivation in SSTs.

H21c: Enjoyment strengthens the positive relationship between resource capacity and co-production motivation in SSTs.

H21d: Enjoyment attenuates the negative relationship between need for interaction and co-production motivation in SSTs.

H21e: Enjoyment strengthens the positive relationship between innovativeness and co-production motivation in SSTs.

H21f: Enjoyment strengthens the positive relationship between optimism and co-production motivation in SSTs.

H21g: Enjoyment attenuates the negative relationship between discomfort and co-production motivation in SSTs.

H21h: Enjoyment attenuates the negative relationship between skepticism and co-production motivation in SSTs.

H21i: Enjoyment strengthens the positive relationship between compatibility and co-production motivation in SSTs.

H21j: Enjoyment strengthens the positive relationship between relative advantage and co-production motivation in SSTs.

H21k: Enjoyment attenuates the negative relationship between complexity and co-production motivation in SSTs.

H21l: Enjoyment strengthens the positive relationship between trialability and co-production motivation in SSTs.

H21m: Enjoyment strengthens the positive relationship between observability and co-production motivation in SSTs.

H21n: Enjoyment strengthens the positive relationship between communication quality and co-production motivation in SSTs.

H21o: Enjoyment strengthens the positive relationship between service quality and co-production motivation in SSTs.

H21p: Enjoyment strengthens the positive relationship between access convenience and co-production motivation in SSTs.

H21q: Enjoyment strengthens the positive relationship between perceived crowdedness and co-production motivation in SSTs.

H21r: Enjoyment strengthens the positive relationship between perceived waiting time and co-production motivation in SSTs.

3.1.2.3 Co-production motivation

Motivation, for this study, represents the quest of investigating the drives that lead to certain individual to prefer an SST over conventional full-service options. The benefits, in terms of various advantages, and costs, in terms of resources put forth, serve as the drivers that ignite co-production motivation. Therefore, motivation is the composition of resources that will be invested in the process, the benefits expected from the process, and the importance of such benefits in relation to costs.

Before advancing to articulation of motivation within this study, an important point on motivation is noteworthy. On their widely cited article, Davis et al. (1992) investigated extrinsic and intrinsic motivation to use computers in the workplace. In order to measure the two types of motivation, they used usefulness and enjoyment as mediating factors between ease of use and output quality. The same constructs were used as surrogates by Venkatesh and Speier (1999) as they delineated motivation and intention in their longitudinal investigation. Both studies clearly stated that perceived usefulness and enjoyment served as facilitators for measuring motivation for the study in question. Therefore, their main aim was to explain and articulate motivation, in general, rather than to understand the properties of perceived usefulness, perceived ease of use and enjoyment.

In recent SSTs literature, the construct “motivation” rarely exists. The literature conceptualizes and empirically tests surrogates for motivation (perceived ease of use, perceived usefulness, and enjoyment) in direct relationship with attitude or intention towards SST (Eastlick et al. 2012, Lanseng and Andreassen 2007, Weijters et al. 2007, Bruner II and Kumar 2005, Nysveen et al. 2005a, Dabholkar and Bagozzi 2002, Childers et al. 2001), by simply omitting the concept of motivation. Although it may be argued that utilizing important individual dimensions, in fact, explains a major variance in construct of motivation, this study argues that it is not possible to grasp the true nature of motivation without inclusion of specific dimensions of intrinsic and extrinsic motivation to understand the importance of motivation in SSTs.

In line with previous findings, this study argues that co-production is an alternative form of service delivery that bears the potential of realizing different sorts of value which will motivate customers to form a positive attitude towards engaging in co-production.

H22: Co-production motivation is positively related to attitude towards co-production in SSTs.

3.1.3 Evaluation of Co-production Cost and Benefits

Calculation of co-production costs and benefits making up the fourth stage consists of attitude towards SSTs and intention to use SSTs, which will be further articulated through Theory of Reasoned Action (TRA) (Fishbein and Ajzen 1975).

3.1.3.1 Attitude towards co-production

The underlying reason for the utilization of TRA is its support for attitudes and intentions to match the behavior expected. Although the chain of attitude, intention, and behavior is widely accepted and used in the literature, previous empirical SSTs research seem to shy away from using the causal chain. As explained earlier through literature review, the assumption of interplay between attitude and intention is not new. A well-established theory in marketing, TRA (Fishbein and Ajzen 1975), explains that the foundation of behavioral intentions is individual’s attitudes towards the behavior (Jarvenpaa et al. 2000).

Attitude, defined as cognitive evaluation of an object or an entity (Eastlick et al. 2012) has been empirically tested in different contexts, especially in relationship with intention. In SSTs, Dabholkar and Bagozzi (2002) demonstrated customers' attitude toward using SSTs is positively related to their behavioral intentions. Similarly, studies of Eastlick et al. (2012), Lanseng and Andreassen (2007), and Weijters et al. (2007) have concluded a direct positive relationship between attitude toward SSTs and intention to use SSTs. In related contexts, Childers et al. (2001) in interactive media, Nysveen et al. (2005b) in mobile chat services, and Kim et al. (2010) in pop-up retail setting have demonstrated the argued direct positive relationship.

In line with previous a conceptual foundation of TRA and empirical results, this study argues that attitude towards co-production is positively related to intention to co-produce.

H23: Attitude towards co-production is positively related to intention to co-produce in SSTs.

3.1.3.2 Intention to co-produce

Intention has been an intriguing area of study for researchers since it, literally, suggests action on customers' part. If one interprets TRA as a chain of events through reasoning, intention may be interpreted as the construct that links attitudes to actual behavior. Such link has received tremendous support in marketing literature, especially, in the context of technology related products. The findings of previous studies related to intentions point to the same direction, which is "people develop intentions to engage in behaviors toward which they have positive attitudes" (Bruner II and Kumar 2005, p. 555).

Previous research findings in SST setting demonstrate the positive relationship between behavioral intentions and actual behavior almost without an exception (Weijters et al. 2007, Venkatesh et al. 2003, Venkatesh and Morris 2000). Consequently, this study proposes a positive direct relationship between intention to co-produce and actual co-production behavior.

H24: Intention to co-produce is positively related to actual co-production behavior in SSTs.

3.1.4 Activation – Actual Co-production Behavior

Etgar (2008) posits the fourth stage as activation in which customers choose the level of participation. Although looking through the lens of Goods Dominant Logic (GDL), the level of participation may include activities such as co-design, co-assembly, co-manufacturing, co-distribution, or logistics, the main idea is to sharing of production responsibilities that make up the offering. Unfortunately, neither the conceptual nor the empirical investigation of activation stage has drawn much attention in the literature mainly due to strong reliance on well-established theories such as TRA. However, as Lin and Hsieh (2006) assert actual behavior should be included in future studies to precise understanding of the phenomenon.

Fishbein and Ajzen (1975) define actual behavior as person's observable response. The constructs; participation (Kotzé and Plessis 2003), trial (Meuter et al. 2005), use (Weijters et al. 2007), actual adoption (Liao and Lu 2008), usage (Meuter et al. 2003), and self-service behavior (Bobbitt and Dabholkar 2001) have been used interchangeably in literature to investigate the stage of activation. This study defines the stage of activation as actual co-production behavior.

There are two important reasons for including the stage of activation in this study. First, although the well established TRA suggests the link between attitudes, intentions, and actual behavior, the previous research models in co-production settings seem to shy away from using the construct of actual behavior, usually ends the chain with intentions, and leaves the second half of the proposed relationship under-investigated. Therefore, through inclusion of actual co-production behavior in the research model, this study will seek to demonstrate complete support for TRA in SSTs setting.

Second, this study not only aims to understand the co-production process but also attempts to investigate its relationship to future intentions on co-production and attitude towards co-creation of value. Theory of Trying (TT) (Bagozzi and Warshaw 1990) explains that the consequences of behavior can influence attitudes toward trying to achieve a goal (Bobbitt and Dabholkar 2001). Respectively, this study posits relationship between consequences of actual co-production behavior to influence both future intention to co-produce and attitude towards co-creation of value.

Bobbitt and Dabholkar (2001) explain that consumers engage in behavior for the benefits they hope to receive. Once the benefits are received, they serve as an amplifier towards favorable attitudes in the specific context as well as related contexts. One of the most common examples of TT includes the example of Internet shopping, which may also be viewed under the SSTs context. A favorable Internet shopping experience is measured through the units of value (intrinsic or extrinsic), usually, expressed in terms of satisfaction. The realized value serve as reinforcer not only on the previously held attitude towards Internet shopping, but also other contexts related to Internet shopping such as Internet in general or other transactions besides shopping carried out through the Internet (Bobbitt and Dabholkar 2001).

Following the same reasoning argued above, this study proposes that perceived value realized as a result of actual behavior will mediate the relationship between co-production outcome and satisfaction. It is presumed that as the satisfaction increases, the end-result of act of trying will increase customers' further engagement. Therefore, it is suggested that satisfaction realized through actual co-production behavior is a determinant of future engagements in co-production, as well as co-creation of value and suggested relationships are mediated by perceived value.

H25: Actual co-production behavior is positively related to satisfaction.

3.1.4.1 Perceived values

Mediation is a causal model that explains the “why” and “how” of the causal effect theorized (Frazier et al. 2004, Rose et al.2004, Baron and Kenny 1986). The simplest analogy that describes the process of mediation is Collins et al.'s (1998, p. 297) domino effect analogy as they describe the mediation process as “a line of dominos and knocking over the first domino starts a sequence where the rest of the dominos are knocked over one after another”. Put simply, a mediator is only a mediator if the changes in the independent variable cause the effect in mediator; subsequently, the mediator causes the change in the dependent variable.

Wu and Zumbo (2008, p. 383) explain mediators to be “a state, a temporary condition of mentality or mood, transitory level of arousal or drive and evoked activities, behavior or processes”, resembling an emotional reaction rather than a stable characteristic,

innate attribute, or a secular process. They further suggest the researchers to dwell on theory to guide them to potential third variables of mediation, and if there is no established theory to be used in such guidance, they advise to explore the third variable through empirical data.

Therefore, whether through established theories or through the exploration of empirical data in order to argue mediation, this study must present (Baron and Kenny 1986):

- a. Direct effect of predicting variable on dependent variable,
- b. Direct effect of predicting variable on mediating variable,
- c. Direct effect of mediating variable on outcome variable,
- d. Direct effect of independent variable on dependent variable that is diminished (full mediation) or lessened (partial mediation) by the inclusion of mediating variable.

Co-production literature in general, SST literature in specific, provide rare examples of studies, where different variables have been proposed to mediate relationships. Therefore, the theory, as limited as it may be, encourages the researcher to theorize on mediation. Yet, perhaps more importantly, another reason for inclusion of mediating variables in this study is the previous contradictory findings of co-production, SSTs, and innovation adoption literature. Empirical studies that have utilized similar constructs in order to investigate the co-production phenomenon, reported findings that seem to be inconclusive and discordant with one another, which prevent future theory generation. Therefore, it has been proposed that inclusion of mediating factors will serve to clarify previous contradictory results and generate knowledge that may be used as foundation for future development.

This study proposes perceived value to mediate the relationship between actual behavior and satisfaction. As argued above, perceived value is theorized to be the mediator since the changes in the dependent variable – satisfaction is possible through the realization of perceived value- the mediator which resemble the line of dominos suggested by Collins et al. (1998).

Perceived value is a widely studied construct in marketing literature identified as crucial part of the customers' decision making process (Baker et al. 2002, Parasuraman and Grewal 2000). Pura (2005, p. 515) defines perceived value as "... trade-off between benefits and sacrifices". Sheth, Newman, and Gross (1991), whose work has been very influential on the subject of value, define five distinct values to be functional, social, emotional, epistemic, and convenience value. In line with Sheth et al.'s (1991) delineation, this study further investigates the role of different values in the shaping of co-production satisfaction.

Emotional value

Emotional value, closest proxy to intrinsic value, is defined as the "utility derived from the feelings or affective states that a product generates" (Sweeny and Soutar 2001, p. 211). Enjoyment and fun are commonly used in SSTs literature (Weijters et al. 2007, Pikkarainen et al. 2004, Dabholkar and Bagozzi 2002, Childers et al. 2001) as previously discussed to explain intrinsic motivation. Pura (2005) demonstrated that emotional value was a strong indicator of commitment in location-based mobile services. This study hypothesizes that emotional value will mediate the relationship between actual co-production behavior and satisfaction with SSTs.

H26a: Emotional value mediates the relationship between actual co-production behavior and satisfaction in SSTs.

Functional value

Functional value is represented by economic value or superiority over alternatives (Pura 2005). Similarly, Sweeny and Soutar (2001) define functional value in terms of price over value for money as well as performance over quality. In SSTs context, functional and monetary value is used due to benefits derived through saving of time and money (Meuter et al. 2000). This study defines functional value as the utility derived from expected performance and argues functional value will mediate the relationship between actual co-production behavior and satisfaction with SSTs.

H26b: Functional value mediates the relationship between actual co-production behavior and satisfaction in SSTs.

Social value

Social value is defined as the enhancement of self-image or approval received from other individuals (Sweeny and Soutar 2001, Bearden and Netemeyer 1999). It is argued that social value emerges in contexts where the value is realized among others. Although social value is well conceptualized in literature, there are few empirical studies that have operationalized social value. The most proximate context to SSTs is the study by Pura (2005) on location-based mobile services, where social value was found insignificant in explaining commitment to use. Yet, as the results of the online check-in (the specific SST context used for this study) are realized among others, this study argues that social value will mediate the relationship between actual co-production behavior and satisfaction with SSTs.

H26c: Social value mediates the relationship between actual co-production behavior and satisfaction in SSTs.

Epistemic value

Epistemic value conceptualized by Sheth et al. (1991) represents the feeling of curiosity especially towards a novel product or service. Epistemic value is similar to Hirschman's (1980) notion of novelty and variety seeking (Pura 2005). Although SST literature has been studying the notion of co-production for the past twenty years, the acceptance of the technologies has been limited as an increase in supply does not automatically suggest acceptance. Yet, as stated earlier, in 2011, Anand proposed that the usage of SSTs in the next years would increase by 80 percent, suggesting likelihood of customers engaging in this novel service provision to realize epistemic value. Literature's guidance on empirical studies on epistemic value is limited. The closest context to SSTs is again Pura's (2005) where she found no significant relationship between epistemic value and behavioral intentions. This study argues that although online check-in may be used on a regular basis for a group of customers, it is still a novel practice for others. Thus, it has been hypothesized that as customers realize epistemic value, this will mediate the relationship between their actual co-production behavior and SST satisfaction.

H26d: Epistemic value mediates the relationship between actual co-production behavior and satisfaction in SSTs.

Convenience value

Convenience value is believed to be an important determinant of overall perceived value in SST context since it is synonymized with the ease and speed such technologies. Similarly, convenience is defined as the “ease and speed of achieving a task effectively and conveniently” (Pura 2005, p. 516). Convenience value has been found to be significant determinant in mobile services and Internet shopping (Pura 2005, Anderson and Srinivasan 2003). This study also argues that convenience value mediates that relationship between actual co-production behavior and satisfaction with SSTs.

H26e: Convenience value mediates the relationship between actual co-production behavior and satisfaction in SSTs.

This study argues that five distinct values discussed above serve as the mediator between actual co-production behavior and satisfaction.

3.1.5 Generation of Outputs and Evaluation of Results

Fifth and final stage of co-production process is generation of outputs and evaluation of results (Etgar 2008). It is the stage, which the perceived benefits are used in further decision making to embark on future intentions of co-production and to form positive attitude towards co-creation of value.

3.1.5.1 Satisfaction and future intention to co-produce

Dong et al. (2008, p. 128) define customers’ intention toward future participation as “customers’ willingness to participate in service production and delivery in the future”. They further demonstrate through their research findings that as customer’s level of participation increases, they become more motivated and perceive higher degrees of service quality since they tend to evaluate their work more positively. As a result, as argued by self-serving bias theory (Wolosin et al. 1973), they gain more confidence and increase their role clarity through self-fulfillment and self-efficacy, which are clear reasons to engage in co-production in the future. Eastlick et al. (2012) demonstrate a strong relationship between attitude towards co-production and future intention to use SST. Shamdasani et al.’s (2008) results echo previous findings as they find the path between satisfaction and continued interaction to be significant.

Therefore, in line with conceptual foundations of TRA and SDT as well as previous empirical findings, this study proposes that satisfaction achieved through actual use, nurtures attitudinal loyalty and increases the level of self-efficacy, which induce future intention to co-produce.

H27: Co-production satisfaction is positively related to future intention to co-produce in SSTs.

3.1.5.2 Attitude towards co-creation of value

FP6 of SDL, which reads “customer is always the co-creator of value” (Vargo and Lusch 2008a, p. 7), has received great deal of attention and support in marketing literature (Grönroos 2011, Grönroos 2008, Payne et al. 2008, Prahalad and Ramaswamy 2004a). The construct of co-creation of value is very rich in nature. Philosophically, it consists of all the commitments made prior to the use-stage as well as commitment to dialog in order to cooperatively create and increase value-in-use for maximum extraction and consumption of value from the service (Ballantyne and Varey 2006, Grönroos 2001). Yet, very limited number of studies have gone beyond conceptualization of value-in-use to find out how the concept could be operationalized and tested within different dynamics.

Grisseman and Stokburger-Sauer (2012, p. 1484) have argued that co-creation is a combination of customers’ skills, time, money, and psychological efforts. They argued that customers’ investment in terms of involvement, experience and time make up degree of co-creation. Although the concept of involvement seems vague, customers’ time and experience are their operand and operant resources that they bring into the equation to be invested in the making of the offering; thus conceptualization and operationalization of the construct resembles of co-production rather than co-creation.

Co-creation, within the boundaries of this study, is defined as the mutual efforts of the company and the customer to increase the value extracted and consumed from the offering. In line with Payne et al.’s (2008) reasoning, it is argued that such collaboration can only take place if the company constantly generates and delivers superior value propositions in order to enable mutual value creation. This argument seems in line with Ngo and O’Cass’ (2009) work on value offering. Ngo and O’Cass (2009) explain the

importance of possession, application, and utilization of company resources to enable value creation activities. Furthermore, they explain “customers buy benefits not products and they obtain services the products render” (Ngo and O’Cass 2009, p. 48). They further discuss in order to achieve such benefits the customers “desire to keep in touch with the firm to get a hassle-free experience, which includes easy access, rapid response and relational nurture” (Ngo and O’Cass 2009, p. 48).

This study argues that such experience can only be achieved through continuous dialog between the parties that will enable joint-learning. The said joint-learning is the source of all activities related to co-creation of value that determines the level of value derived from the offering during use stage (Ballantyne and Varey 2008, Ballantyne and Varey 2006, Ballantyne 2004). Subsequently, customer’s attitude towards co-creation of value is defined as the individual’s evaluation on realizing value-in-use by interactive process of learning together which will enable them to enrich use experience through company’s efforts and expertise. This point leaves the customer with the question of selection. Which companies does the customer select to engage in future interaction for value creation? This study argues that the conceptualization of the nested nature of co-production and co-creation is the answer to this question.

As discussed in previous sections, Etgar (2008, p. 97) argues that production and consumption are nested concepts and “consumption activities are not separate from production activities, but connected to them”. Similarly Vargo and Lusch (2009, p. 230) argue co-production to be “an optional subset of the non-optional value co-creation”.

This study argues that successful co-production episode is a reason for customers to select a certain company over the other to embark on future learning to enable value creation. Respectively, it is argued that co-production satisfaction is positively related to attitude towards co-creation of value.

H28: Co-production satisfaction is positively related to attitude towards co-creation of value in SSTs.

Control variables - Demographics

Although utilization of demographic variables is a common practice throughout literature as it provides practical as well as theoretical value (Weijters et al. 2007), scholars seem to shy away from using demographics as it produces inconclusive and contradictory results.

Demographic variables as moderators (Weijters et al. 2007, Nysveen et al. 2005b) or antecedent conditions (Meuter et al. 2005) have been used sparingly in SSTs context. Yet, Weijters et al. (2007, p. 6) argue, understanding the effect of demographics is important, due to its “practical and theoretical value”, because it results in “actionable information”.

In SSTs context, the studies of Meuter et al. (2005) and Weijters et al. (2007) have theorized on relations between various demographic variables, yet their results, also, seem to be inconclusive. Meuter et al. (2005) have demonstrated that while income had no significant effect impact on SST usage, the role of gender produced conflicting results among various SST settings. They have reported age to be the most consistent demographic predictor in the sense that usage of SST increased with the increase in age. Paradoxically, Weijters et al. (2007) concluded that age was not determinant of SST usage intentions. Yet, they have demonstrated education’s effect on the relationship between perceived newness and attitude, attitude and actual usage as well as gender’s effect on the relationship between ease of use and attitude in self-scanning context.

Other studies also concentrated on the effect of income and education (Darian 1987, Cunningham and Cunningham 1973), as well as age (Rogers 1995) and gender (Nysveen 2005b). Education and income has argued to be determinant of use of SSTs, due its time-saving quality. Weijters et al. (2007, p. 6) argue people with higher education and income levels will have higher degree of time orientation and their motto of “time is money” will lead them towards SSTs options. Age is also argued to be a strong determinator of technology use, as young people show higher propensity towards technological options (Morris and Venkatesh 2000). The effect of gender on SST usage or acceptance seem to be controversial, since while men argued to be usefulness oriented, women favor ease of use in technology related products (Venkatesh and Morris

2000). Yet, Weijster et al.' (2007) results do not echo Venkatesh and Morris' (2000) findings.

Nysveen et al. (2005a) have investigated the moderating effect of gender between perceived enjoyment, perceived usefulness and perceived ease of use in relation to intention to use in mobile chat services setting. The results have demonstrated gender moderated two of the three relationships. Enjoyment was reported to be strong determinant for female users. On the other hand, usefulness was found to be affecting male users more strongly than females. Interestingly, the difference between genders was not significant for the relationship between ease of use and intention to use mobile chat services.

As the literature regarding demographic variables suggests, these variables have been used as predictors in SSTs context rather than actual controlling variables. In other words, previous investigation of demographic variables have been on the direct relationship they have with the endogenous variable rather than on their confounding effects between the exogenous and endogenous variables theorized.

In order to count for the confounding effects of demographics variables of gender, age, marital status, education, and income on the causal relationships formerly proposed, the following hypothesizes have been developed:

H29a: There is a positive relationship between expertise capacity and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29b: There is a positive relationship between risk-taking capacity and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29c: There is a positive relationship between resource capacity and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29d: There is a negative relationship between need for interaction and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29e: There is a positive relationship between innovativeness and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29f: There is a positive relationship between optimism and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29g: There is a negative relationship between discomfort and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29h: There is a negative relationship between skepticism and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29i: There is a positive relationship between compatibility and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29j: There is a positive relationship between relative advantage and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29k: There is a negative relationship between complexity and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29l: There is a positive relationship between trialability and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29m: There is a positive relationship between observability and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29n: There is a positive relationship between communication quality and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29o: There is a positive relationship between communication quality and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29p: There is a positive relationship between access convenience and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29q: There is a positive relationship between perceived waiting time and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29r: There is a positive relationship between perceived crowdedness and co-production motivation in SSTs when controlling for age, gender, education, income, and marital status.

H29s: There is a positive relationship between co-production motivation and attitude towards co-production in SSTs when controlling for age, gender, education, income, and marital status.

H29t: There is a positive relationship between attitude towards co-production and intention to co-produce in SSTs when controlling for age, gender, education, income, and marital status.

H29u: There is a positive relationship between intention to co-produce and actual co-production behavior in SSTs when controlling for age, gender, education, income, and marital status.

H29v: There is a positive relationship between actual co-production behavior and satisfaction in SSTs when controlling for age, gender, education, income, and marital status.

H29w: There is a positive relationship between satisfaction and future intention to co-produce in SSTs when controlling for age, gender, education, income, and marital status.

H29x: There is a positive relationship between satisfaction and attitude towards co-creation of value in SSTs when controlling for age, gender, education, income, and marital status.

List of hypothesis of the study is presented in Appendix B.1.

4. METHODOLOGY AND RESEARCH DESIGN

Bryman (1984) argues that the debate surrounding the quantitative versus qualitative research needs to be evaluated on two different dimensions. First are the philosophical issues related to both ontology regarding the meaning of the world around us and epistemology regarding the appropriateness of methodology used to understand this world. Second are the specifications of the methodology as well as rigor in explaining the phenomenon utilizing different research methods.

As ontological debates are beyond the scope of this research, this section will address epistemological and methodological reasons to why qualitative research in conjunction with quantitative research was utilized as the research method for this study.

Epistemological debate in terms of research in social sciences, boils down to two far ends of the epistemological continuum. On one far end of the continuum lies positivism which interprets science as confirmation of a set of probabilistic causal laws (Neuman 2004) with the sole aim of developing objective methods to get as close as possible to reality (Tuli 2011). On the other far end of the continuum lies interpretivism that regards the world as construction and interpretation of the people involved and social systems they merge in (Lincoln and Guba 2005). The aim of the interpretivist approach is to grasp a richer and deeper understanding rather than the attempt to generalize the causal laws (Ulin et al. 2004).

Methodology defined as the “research strategy” (Tuli 2010) determines how the research will be conducted, yet as Sarantakos (2005) explains, the world view of the researcher brings along the methodological underpinnings for the study. Quantitative research methods associated with objectivist ontology and empiricist epistemology are concerned with hypothesis testing in order to confirm causal explanations (Marczyk et al. 2005). On the other hand, qualitative research methods through constructionalist ontology and interpretivist epistemology are concerned with understanding meanings and experiences “mediated through researcher’s own perceptions” (Tuli 2010, p. 102).

The choice regarding the root of the research and specific methodologies used lies in the nature of the phenomenon under study as well as the experience and preference of the researcher since there is no single research methodology that can be applied to all research problems. As Schulze (2003) explains, every research methodology comes with a set of weaknesses and strengths, and choosing one over the other means inevitable loss. In order to avoid such loss, researchers use mix methods in the hope of having best of the two worlds.

Mix methods in a single research may be used for different reasons such as gaining variety of information or being able to grasp the true nature of the problem looking from different sides (Holloway 1997). This view is supported by Mingers (2001) as he explains different paradigms should not be treated as mutually exclusive.

As the aim of the study is to describe a process of co-production and test the pre-formed hypothesis on customer's involvement through the co-production process linking it to co-creation of value, this study relies on positivist paradigm (Deshpande 1983). Yet it still utilizes selected qualitative methods at the initial stage of the study in order to gather a deeper understanding of the phenomenon.

In light of the information provided above, the next sections will explain the mix methods of research design and how each method was utilized during different phases of this study.

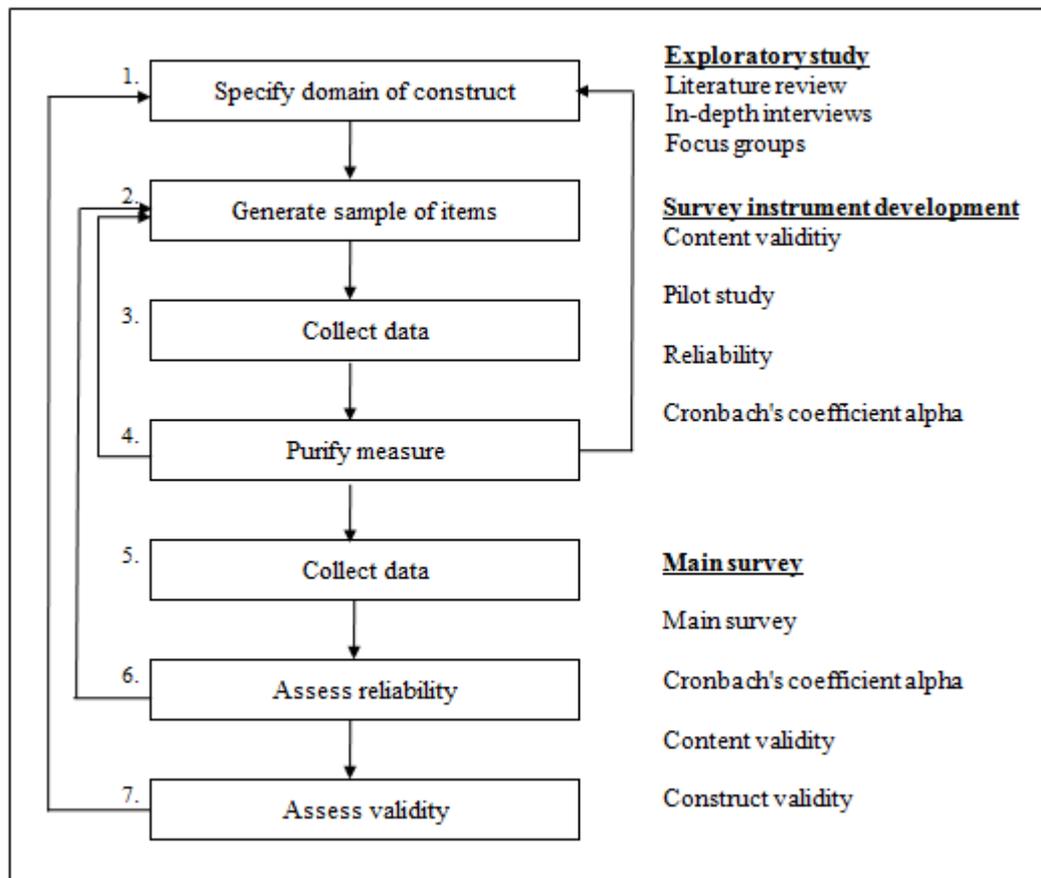
4.1 RESEARCH DESIGN AND METHODS

Churchill (1991) explains research design to be the blueprint of the study. Yet "there is never a single, standard, correct method of carrying out research" (Simon 1969, p. 4). Due to the limitations each research method bears, very frequently, studies use different methods conjunctionally in order to tackle the research problem.

This study uses both qualitative and quantitative methods during different stages of the study as it advances to answer the research questions formed. It follows the flow recommended by Churchill (1979) and starts with exploratory stage, advances to survey instrument development, and then to the main survey as presented in Figure 4.1.

The first phase, namely exploratory phase, consists of literature review, in-depth interviews with company executives, and focus groups with consumers.

Figure 4.1: Suggested procedure for developing better measures



Source: Churchill, G.A. Jr., 1979. A paradigm for developing better measures of marketing constructs. *Journal of Marketing*. **16** (February), p. 66.

Literature review is an important step for almost every research since science moves forward in cumulative manner, and literature review plays a crucial role in interpreting and combining existing knowledge with the aim of the research (vom Brocke et al. 2009). In novel areas of research such as Service Dominant Logic (SDL), the importance of rigorous literature review gains even more importance as the researcher tries to locate relevant literature that will guide her on such new endeavor.

In-depth interviews with company executives follow literature review in order to grasp the nature of the context of the study and to make sure conceptualization of the phenomenon fit well with practice. Furthermore, as the study includes unique

constructs(resource capacity and attitude towards co-creation of value) that had never been operationalized in previous literature, to the best of the researcher's knowledge, in-depth interview findings are utilized in such task.

Exploratory fieldwork, respectively qualitative phase of the study, concludes with focus groups with consumers. As the research model proposed attempts to test a co-production model from consumers' perspective, focus groups are a crucial step to gain insight on their views and an opportunity for the researcher to deepen her understanding on the bigger picture.

In light of the literature review and analysis of exploratory fieldwork, the researcher is able to specify the domain of each construct and respectively define the boundaries for each of them before moving on the second stage.

Churchill (1979) specifies the second stage to be generation of sample items. In light of the exploratory study of the first phase, the sample items are generated by the researcher and then evaluated by academics in order to establish content validity before advancing to pilot study.

The main aim of the pilot study stage is to diagnose problems with the items before moving on the main study. The problems are detected at this stage through the various analyses that will be articulated in the next sections.

Finally, the research moves on third phase; where the main study is conducted, in which data is collected through survey questionnaire and analyzed to establish reliability and validity of the findings.

4.2 EXPLORATORY FIELDWORK

Qualitative research methods associated with inductive approach is argued to provide rich and insightful information regarding human behavior (Guba and Lincoln 1994). Schmid (1981) defines qualitative research as "the empirical world from the viewpoint of the person under study" (Krefting 1991, p. 214). Qualitative research is about meanings and subjective perceptions of the individuals on the research's subject matter and the task undertaken by the researcher is to gain understanding of these meanings and perceptions.

Literature review, followed by qualitative data collection methods, assist the researcher in various ways. First, it helps gain deeper understanding of SDL in order to see the bigger picture of value creation chain, which in return helps with associations and links between different constructs. Furthermore, literature review guides the researcher in specifying the domain of the constructs and carefully drawing their boundaries (Churchill 1979).

Literature review is also helpful for forming conjectural associations in novel areas of studies (vom Brocke et al. 2009). Once such associations are established, the researcher seeks to understand previous empirical studies and their findings to interpret the linkages that have been previously established and the contexts of such studies.

Second, qualitative data collection methods are utilized to understand if, in fact, the implications of the literature review correspond to the real world. Furthermore, this phase assists researcher to detect issues that the literature review phase have not revealed.

This study uses in-depth interviews with industry experts and focus groups with customers as qualitative data collection method in order to uncover salient issues about the research topic before advancing to second stage of the research. In line with Denzin and Lincoln's (2003, p. 5) explanation since this study seeks to interpret "phenomena in terms of the meanings people bring to them", it makes use of advantages of each of the qualitative techniques used.

The methods utilized and the findings reached are articulated in the next section.

4.2.1 In-depth Interviews

The first step of the qualitative data collection phase was conducting in-depth interviews with industry experts. Stokes and Bergin (2006) define in-depth interview technique as the unstructured personal interviews in which the researcher uses intensive probing to uncover underlying issues.

In line with the context of the study which is the online check-in system as the surrogate for the exploration of co-production process through SSTs, the researcher contacted a

leading Turkish airline, operating both domestically and internationally, in order to gain insight through in-depth interviews.

The specific airline was chosen since it was the largest operating airline in Turkey in terms of routes flown, personnel employed, passenger carried domestically, and internationally¹. The researcher contacted managers responsible for online check-in systems and was able to interview both Enterprise Systems Manager and Online Sales and Marketing Manager regarding the online check-in system.

The interviews were unstructured and undisguised. Nevertheless a sheet of topics was present to ensure that all the areas that needed to be touched-upon were included in the meetings. The interview check-list/questionnaire is provided in Appendix C.1. The first interview lasted 70 minutes and the second interview took 45 minutes.

In line with the aim of conducting in-depth interviews, variety of topics was discussed and the managers were probed by the researcher to uncover salient issues. The interviews started with broader topics such as industry related and company specific information, new trends in the aviation industry, and the increasing importance of online systems.

The interviews were directed to specifics of the online check-in system with the guidance of the researcher. At this stage, there were several important issues that needed to be covered.

First, the technology behind online check-in system and its impact on passengers were discussed. The importance of this issue lies in the domain of the construct of resource capacity. Resource capacity is defined as the possession of operand resources (which are static resources such as a computer, various mobile devices, or Internet connection in this context) in order to complete the task of online check-in. The researcher probed the executives in order to understand the system running behind the scenes and what the passengers come to know as online check-in as well as to understand what type of operand resources were necessary for a passenger to successfully complete online check-in.

¹Republic of Turkey Prime Ministry Investment Support and Promotion Agency. *Frigh and Logistics Industry Report*. 2010. Ankara.

Second issue, which was touched-upon, was related to semantics. The terminology surrounding the online check-in system, co-production, and co-creation was brought up by the researcher, and the managers were probed to get insight on common or every-day use of such terminology before moving on to the focus group stage with consumers.

As the scale of co-creation was to be generated by the researcher, the airline's perspective on accompanying passengers to value in-use stage was also investigated. During the in-depth interviews, interviewees were probed to get insight on delivering superior value propositions through dialog. Their views on joint learning throughout the process was discussed to understand how value extraction and consumption stages could benefit from such collaboration.

Finally, demographic information regarding existing passengers, who use online check-in, was elaborated since such information would assist the researcher in identifying relevant subjects for the focus group discussions, which were planned next.

4.2.2 Focus Groups

Increasing number of researchers argue that different methods can be used throughout the same study (Holloway and Wheeler 2009). Namely, triangulation is the research process that incorporates variety of methods in order to study a single phenomenon. Denzin (1989) argues that there are four different types of triangulation, which are data triangulation, investigator triangulation, theory triangulation, and finally, methodology triangulation. This study utilizes methodology triangulation, which will briefly be introduced next.

Methodological triangulation comes in two distinct versions (Halloway and Wheeler 2009). Intra-method triangulation, also referred to as within-method triangulation, is when the researcher stays within the same research paradigm but adopts different methods of inquiry. This study utilizes intra-method methodology triangulation as it commits to two different ways of exploration during qualitative phase by having focus groups with consumers, following the in-depth interviews discussed in previous section.

Focus group is a commonly used qualitative research method described as “a group of individuals selected and assembled by researchers to discuss and comment on, from

personal experience, the topic that is the subject of the research” (Powell and Single1996, p. 499) with the distinguishing character of the “insight and data being produced by the interaction between participants” (Gibbs 1997, p. 2).

As the definition of the focus group indicates, the participants of the focus groups were selected and assembled in light of the information gathered from airline executives. Three focus group discussions were conducted on the basis of judgment sampling. Judgment sampling was preferred since random sampling has almost never been associated with qualitative research. According to Marshall (1996, p. 523)

Random sampling of a population is likely to produce a representative sample only if the research characteristics are normally distributed within the population. There is no evidence that the values, beliefs and attitudes that form the core of qualitative investigation are normally distributed, making the probability approach inappropriate. Furthermore, it is well recognized by sociologists that people are not equally good at observing, understanding and interpreting their own and other people's behavior.

Therefore, it has been well established in the literature that purposive sampling is the most appropriate method of sampling in qualitative research (Miles and Huberman 1994). The intended meaning of purposive sampling is the selection relying on the judgment of the researcher to ensure the participants selected will produce the most productive answers relevant to the research question(s). In order to form the judgment necessary, demographic information obtained from in-depth interviews was used.

Each of the focus groups consisted between six to ten participants, which is the recommended number by MacIntosh (1993). In-group homogeneity was sought to enable maximum flow of information through each participant feeling comfortable within the group to express his/her feelings. At the same time, inter-group heterogeneity was sought in order to reach diverse experiences and insights (Morgan 1988). The focus group discussions were all moderated by the researcher and held in a neutral place to ensure comforting environment for all participants (Powell et al. 1996). Meetings lasted from 70 minutes to two hours, all of which were audio-taped with the verbal consent of the participants.

Although the researcher regarded and promoted a natural flow of ideas, shying away from repeated interruptions on her side, she still had a question check-list ready to make sure that all areas of interest were covered during the discussion. The check-list of

questions used in focus group discussions are provided in Appendix C.2. The results of the qualitative analysis are presented in the next section. Demographic information regarding focus group participants and core points discussed are provided in Table 4.1.

Focus group discussions started with allowing free flow of ideas between respondents regarding air travel. On all three focus groups, the topic of online check-in was brought up by one of the participants. After the mentioning of the online check-in for the very first time, the participants were probed further by the moderator to make sure various topics were touched-upon. All audio files were transcribed by the researcher and analyzed using Nvivo 10 Qualitative Data Analysis Software Program (Nvivo 10). The next section will discuss the findings of focus group analysis.

4.2.2.1 Focus group findings

Qualitative data analysis is argued to be very difficult task as Miles (1979) argues that it has very few guidelines. He further argues it resembles “a mysterious, half-formulated art” (Miles 1979, p. 593). One of the most common methods to tackle the challenge of qualitative data analysis is identifying and refining the concepts of the study, which are carried out through conceptualization, coding, and categorization (Schutt 2011). In order to carry out analysis, common themes that emerge from raw data is sought to determine patterns, which will allow the researcher to generate conclusions. Respectively, qualitative data analysis through Nvivo 10 has been conducted to analyze insights that emerged through focus group discussions.

The first step in the process of analysis was reading through the data to understand the common themes. The common themes in the Nvivo 10 are also called nodes. The aim of this step was the group words or chain of words under the specified nodes. As noding of the initial stage continued, the researcher became aware that some of the nodes were actually indicating the same idea; therefore, needed to be merged. After noding of all three focus group discussions were completed, the next step was to form higher order conceptual categories through forming associations between the nodes initially created. Through the second step, the researcher was able to create a hierarchical node tree to advance to final stage of analysis. Glasser and Strauss (1967) describe the final stage of

Profile of participants	Group size	Duration of the session	Key points discussed
Age range: 27-43 Gender: 3 female / 7 male Marital status: 5 single / 5 married Occupation: 3 executives / 7 white-collar professionals Education: Higher education level	10	70 min.	<ul style="list-style-type: none"> - General discussions about air travel - Airline generally preferred - Specific reasons for preferring an airline over others - Differentiation points between airlines, mainly in terms of service provided
Age range: 32-48 Gender: 2 female / 4 male Marital status: 2 single / 4 married Occupation: 2 white-collar professionals / 2 self-employed / 2 home-makers Education: Higher education level / Some undergraduate education	6	70 min.	<ul style="list-style-type: none"> - Services preferred and underlying reasons - Describing the process of online check-in - Passenger typology that uses online check-in - Resources needed in order to conduct online check-in - Expectations from online check-in
Age range: 28-49 Gender: 2 female / 6 male Marital status: All married Occupation: 7 white-collar professionals / 1 self-employed Education: Higher education level	8	90 min.	<ul style="list-style-type: none"> - Past experiences and anecdotes - Level of satisfaction with airlines in general and online check-in systems in specific - Other ways that an airline can contribute to total experience of travelling and means for such collaboration

Table 4.1: Focus group participant demographics

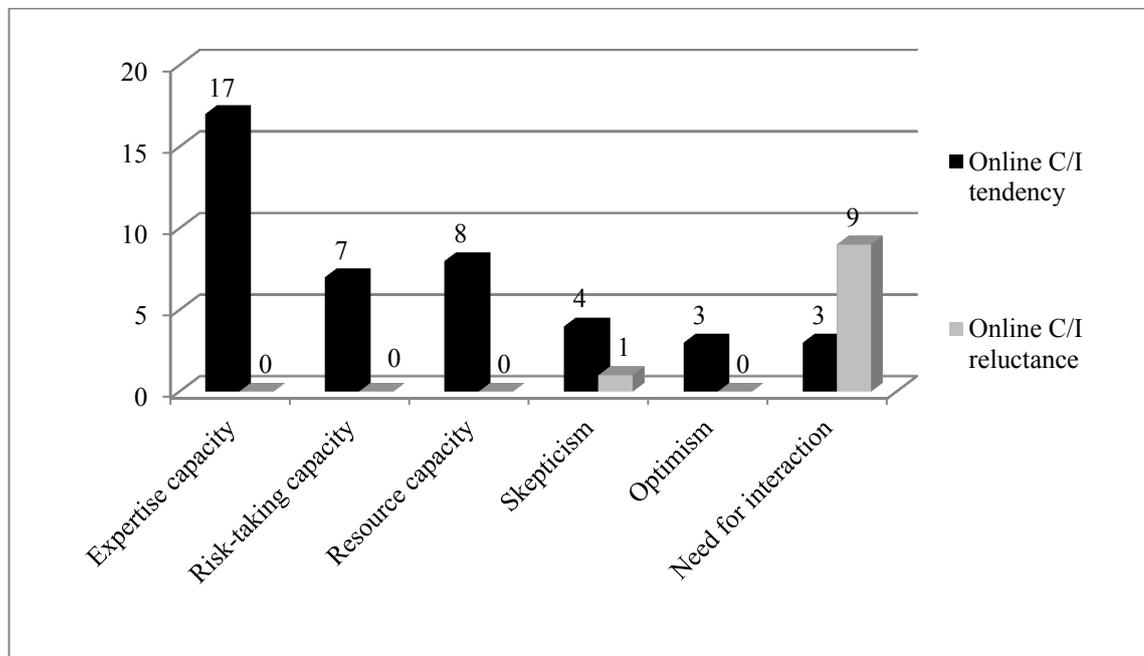
qualitative data analysis as constant comparative method. The constant comparative method included making comparisons through nodes to make sure the nodes created were mutually exclusive. By the help of final stage, the researcher sought to ensure that there were no cross loadings between node trees and that each node was grouped in its meaningful category. Once the coding was completed, the researcher ran coding comparison, word frequency, and matrix coding analysis to finalize this stage.

The next section will briefly summarize the results of focus group findings between conceptually linked constructs.

4.2.2.1.1 Customer linked factors

Focus group participants commonly determined expertise capacity, risk-taking capacity, resource capacity, skepticism, and optimism in association with online check-in tendency and need for interaction in association with online check-in reluctance. Figure 4.2 summarizes the matrix coding results for customer linked factors.

Figure 4.2: Customer linked factors matrix coding by number of codes for each node



Among focus group participants who showed tendency towards online check-in, the most commonly expressed theme was expertise capacity. The participants associated

online check-in with other technologies that they needed to use in order to complete a task. The recurring theme was the tendency to use such technologies, and it was directly correlated with how experienced the person was in using similar technologies.

If you are a person that is doing it for the very first time, you may think 'what is going to happen?' But what happens is, if you are a person that is used to making use of technology completing stuff: for example, if you are doing online banking, online shopping, you get accustomed to the systems, and you think of them as less risky. I think, these are the things that lead to one another. You do these things as you learn more about them, as you do more, you get accustomed to it, and then you use it for something that might be more important to you, like this for example [referring to online check-in]. (DT, Male, 33, Systems officer)

Resource capacity indicating operand resources of the customer, which is to be invested in the co-production process, was mentioned without probing on the researcher's part during discussions. Resources capacity was the second most mentioned customer capacity.

First of all, you need to have a computer with Internet connection of course. Then, you have to have a printer, so you can print your card... [referring to boarding pass]. (BK, Female, 37, Psychologist)

You need to have the technology. You may be as technology savvy as you like, if you don't have the equipment to do it, then you cannot (ÇA, Male, 47, Consultant)

Risk-taking capacity was another topic that was discussed heavily. Although participants argued that technologies such as online check-in beared a degree of risk, it was the user who needed to absorb or tolerate the risk in order to function in modern day life.

Everything is risky at the end of the day. Everything you do over the Internet bears a sort of risk. You need to bear with it, you need to do what you need to do. (TÇ, Female, 27, Home-maker)

To think it is risky means for you to think 'Will I get into some kind of trouble when I do this?' How do you prevent that from happening? By doing it over and over again, you realize nothing bad happens, and you move on doing it. It is not something you can prevent from happening. I mean, you can't run away from it. (DSA, Female, 43, Accountant)

Technology Readiness (TR) was discussed at length during focus group discussions. One of the two mental enablers -optimism and one of the two mental inhibitors - skepticism were mentioned frequently by the respondents. The respondents shared their thoughts about technology's ability to work properly.

People think twice before doing such things. You give out your credit card information, almost every bit of information over the Internet. You doubt if

something bad is going to happen. What you are doing, actually, is risking your security in dispense of your comfort. (ÖT, Male, 49, Sales Director)

Well, it works, doesn't it? Besides the tales distributed through the Internet, have you met anyone that had lost money or anything? Just think about everything you do over the Internet. Can you imagine doing them in person? I don't think so. We just have to be appreciative of technology. I don't think we understand the amount of flexibility technology gives us throughout the day. (ÇA, Male, 47, Consultant)

Need for interaction was one of the topics that the researcher needed to probe on following the discussion on TR. The participants, who said they were reluctant to use SSTs in general and online check-in in specific, were strongly opinionated on need for interaction. Matrix coding results for need for interaction showed that the passengers, who described themselves as reluctant to check-in online mentioned the importance of interaction with the service employee more frequently than those participants who had online check-in tendency.

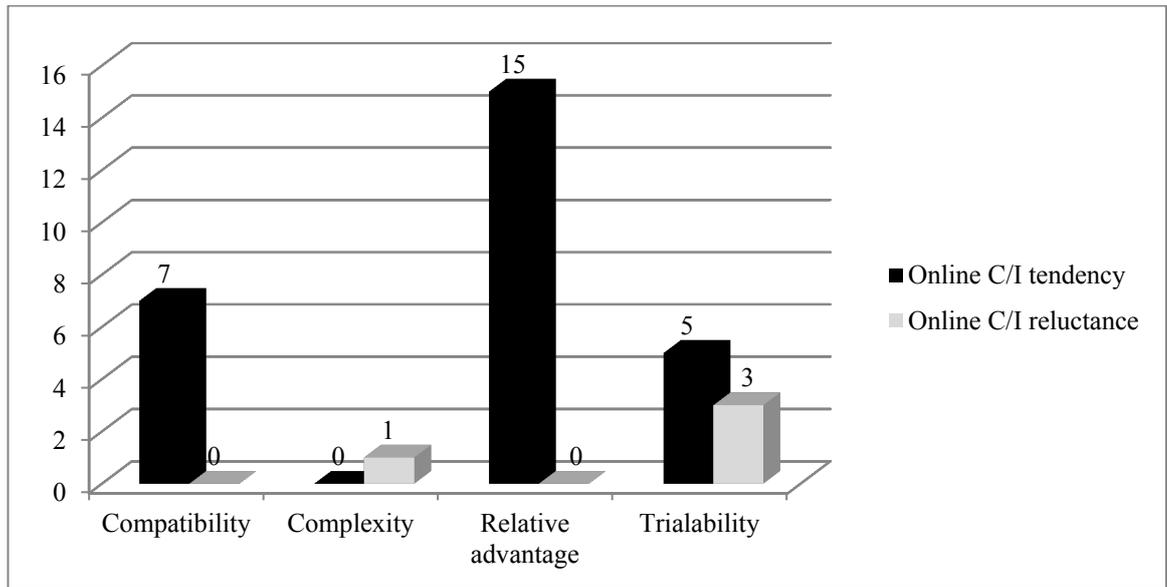
I don't want to do online check-in, I want to see somebody in front of me, I want to talk to somebody. (GT, Female, 34, Marketing Manager)

Of course I want somebody there. If something goes wrong, you want to be able to say, 'Well, such and such lady back there told me this or that' (KÜ, Female, 34, Teacher)

4.2.2.1.2 Service linked factors

Complexity, compatibility, relative advantage and trialability of the service linked factors were discussed at length. Discussion on complexity was mainly dominated by the complexity of the online check-in system as associated with online check-in reluctance. While the participants who categorized themselves as having tendency towards online check-in did not mention complexity, all the discussion surrounding complexity came from participants who mentioned they were reluctant to check themselves in using online systems. Figure 4.3 demonstrates matrix coding for service linked factors.

Figure 4.3: Service linked factors matrix coding by number of codes for each node



Relative advantage was the most discussed topic related to service linked factors, since the participants with prior online check-in experience had insight to provide on the advantages that the system provided. Only the participants who had tendency towards online check-in mentioned the system’s relative advantage. The running theme around relative advantage was the fact that it was mostly the relative advantage that motivated the customers’ online check-in usage.

What matters for the passenger is the advantage it provides. Isn't it how this thing [referring to online check-in] started? Now think about it. There is this system but it provides no benefits. Why would you use it? It has to provide some sort of advantage to the passengers. It has to motivate them to use it. Why else would you use it? (TK, Male, 45, Systems Manager)

Compatibility was associated with life styles, and the major theme running around the topic of compatibility was the new generation’s ability, expertise, and familiarity with similar systems, and how much easier it was for them to adapt to such new technologies.

Youngsters would do such things more frequently. Why? Because they grew-up on these things. They had Internet, mobile phones, Ipods when they were born (BA, Male, 48, Technical Officer)

Complexity was introduced by participants who identified themselves as, individuals who were reluctant to check-in online. The main idea behind reluctance was either the belief

that such systems would be complex to use or prior experience of complexity, specifically of online check-in or similar technologies.

Would it be possible for them [referring to the airline company] to make the system any more complicated than it is? First, you need to find some kind of a number. Provide your password. The only thing they don't ask for is your blood type. I say to myself, why bother? (AK, Female, 36, Lawyer)

The final dimension of service linked factors discussed was online check-in system's trailability. Both participants who had tendency, as well as reluctance towards online check-in mentioned that opportunity to try out the system before using it or in case of any change/update in the system was crucial.

A way to encourage people who are unfamiliar with Internet to try the system would be to educate them. Maybe have them try out the system first (ÇA, Male, 47, Consultant)

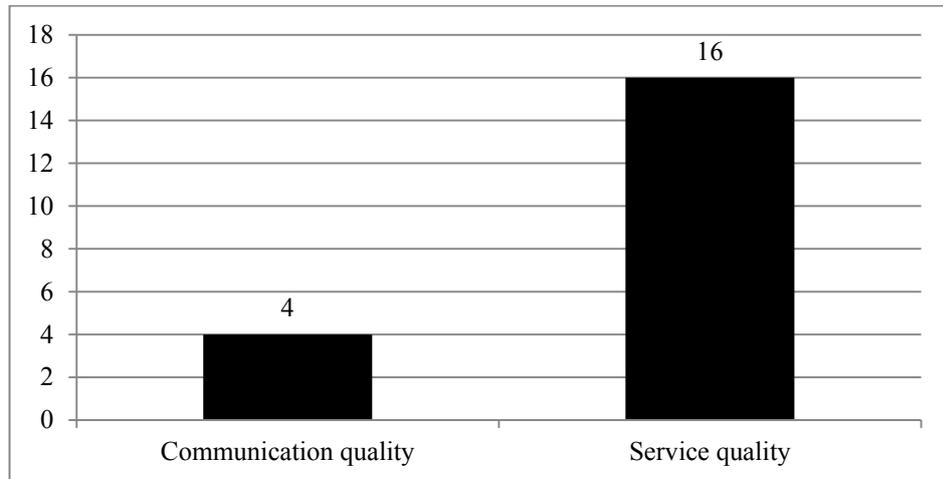
It is a bit disappointing when you think you know everything about it, then all of a sudden, they bring you this completely new pop-up page. I mean, I can understand there are regulations, and it may not even be the airline's fault, but it would be nice for them to warn you if there is something different. They can let you know in advance about the changes, show you what the changes are, or even run a dummy check-in, for example. I don't think it would be that hard to create a test run (ÖT, Male, 49, Sales Director)

4.2.2.1.3 Company linked factors

Although communication quality was briefly brought up on different sessions, the dominance of service quality on discussions were apparent. Figure 4.4 demonstrates the word count analysis of company linked factors.

All five dimensions of SERVQUAL (Parasuraman et al. 1988) were discussed at length. Figure 4.5 demonstrates the coding analysis for the dimensions of service quality.

Figure 4.4: Company linked factors analysis by word count



Communication quality

Communication quality was a company linked factor that was briefly touched upon by the participants. Although matrix coding analysis did not result in any significant difference between participants with tendency and reluctance towards check-in in terms of communication quality, participants generally felt the communication quality of the airline was insufficient.

The most important outlet for them is TV. They do mass things. They don't want to bother with every single one of us individually. (NT, Male, 47, Banker)

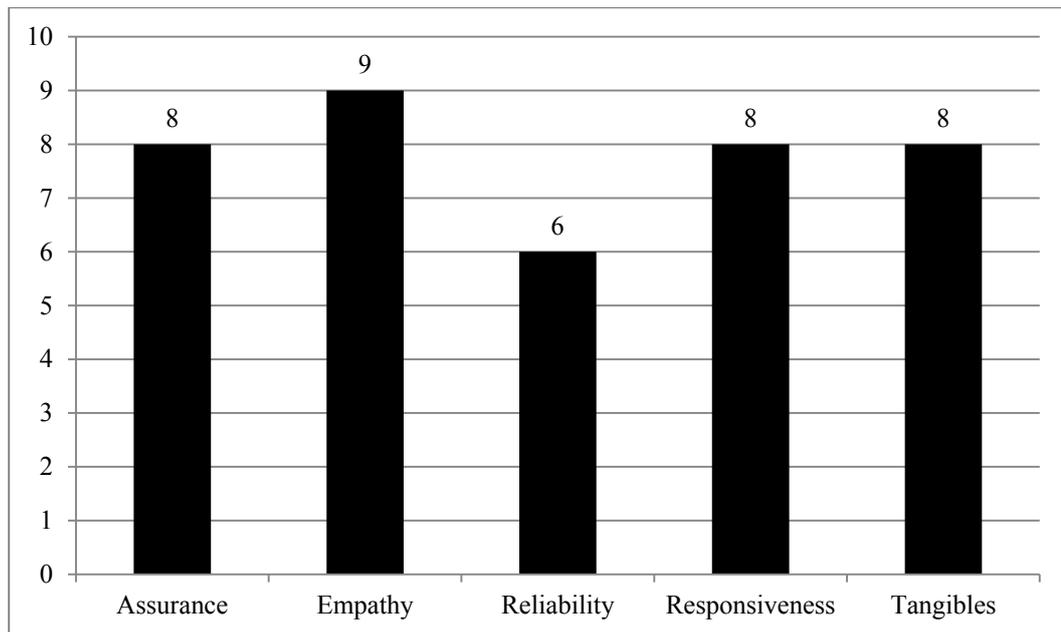
I don't think there is much quality to their communication because there is not much communication. I don't receive any kind of communication from them. And as for TV commercial with stars, what's that got to do with me? (KÜ, Female, 34, Teacher)

Service quality

During the first focus group discussion, the topic of service quality gave the respondents, who were reluctant to join discussions, an opportunity to share their feelings and experiences. Therefore, the researcher paid special attention to tap into the topic of service quality at the beginning of the remaining two focus groups in order, for less engaged participants to gain confidence to share their thoughts. Although service quality was a major theme of discussion, it was the hardest topic for the researcher to keep in track since on all three discussions the topic had the tendency to turn into sharing of memories regarding service quality issues at length.

The separate dimensions of service quality were discussed in all focus groups. Regardless of the participants' level of tendency towards online check-in, the common idea of the participants was that the level of service quality was inherently decisive factor for choosing an airline over the others. Below are several examples of different service quality dimensions that are depicted during focus group discussions and their intended meanings.

Figure 4.5: Service quality dimensions analysis by word count



Service quality – Assurance

Assurance, as the first dimension of service quality, is defined as “knowledge and courtesy of employees and their ability to inspire trust and confidence” (Parasuraman 1988, p. 23) was touched upon clearly in terms how the airline staff courteously gave information at the time of need.

Suppose you are stuck in the plane because they will not open the doors for some reason, or you are in a difficult situation. I know, after a long flight, we had landed and had been waiting for the staircase to arrive. Everybody got up from their seats. We are waiting and waiting. As it got crowded and time passed by, everybody got agitated and they started complaining and fussing. Even then, stewardess were so kind. They kindly tried to explain what was going on. They tried to gather information on what was going on and, actually, tried to inform us. They just knew everybody was a wreck from exhaustion and made sure we felt safe and informed. That’s very nice. (EÇ, Female, 32, Teacher)

Service quality – Empathy

Empathy was the service quality dimension that had been mentioned by the participants most frequently. Parasuraman et al. (1988) defined empathy by firm's efforts to provide caring, individualized attention to its customers. Empathy was touched upon through respondents' views on how the airline staff internalized passengers' problems and gone beyond their job description to help the passengers.

Every time I fly, there is a baby around me. Either in the seat next to me, back or front, there is always a screaming baby. And every single time, without even the mother asking for help, do I see a member of the cabin crew come and help the mother. I have seen a stewardess rocking a baby to put him to sleep, can you believe that? If we were a foreign airline, the mother would be lucky if the stewardess pretended not to hear the baby, otherwise she might even get yelled at. That's how cruel they are (KD, Female, 48, Home-maker)

Service quality – Reliability

Reliability, defined as the “ability to perform the promised service dependably and accurately” (Parasuraman 1988, p. 23) was also discussed. The participants mentioned the adequacy of the airline staff and how well they were trained to complete the tasks they were expected to undertake.

They know their job. They are very well trained. They are like an automated system and I feel very safe with my transactions. I have never had problems with them, and I believe they are very credible in that aspect (SB, 33, Male, Strategist)

Service quality – Responsiveness

The fourth dimension of service quality as advocated by Parasuraman et al. (1988, p. 23) is responsiveness. It is defined as the “willingness to help customers and provide prompt service”. Responsiveness was also discussed by the participants in terms of airline's staff desire to be punctual in their duties.

I think they are performing the best they can. I can see they are short staffed most of the time. Normally, what they should do is, relax and not stress about it. Why? Because it is not their problem that there aren't enough people. They, sincerely, believe they are doing the best they can. They are accurate, prompt, and kind; what more would you want? (AK, Female, 36, Lawyer)

Service quality – Tangibles

The fifth and final dimension of Parasuraman et al.'s SERVQUAL(1988, p. 23) is tangibles, defined as “physical facilities, equipment, and appearance of personnel”.

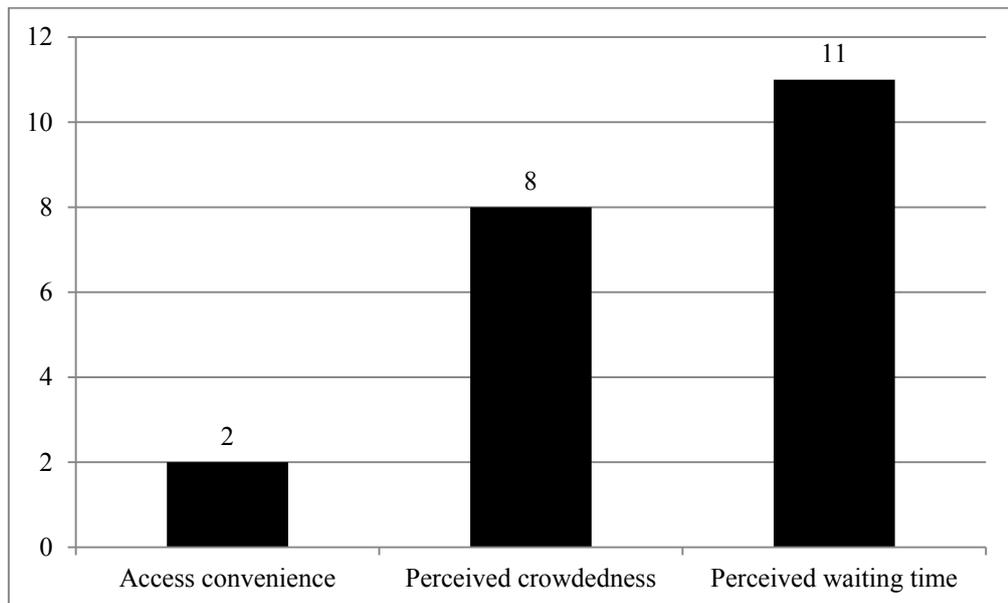
Tangibles were also mentioned during focus groups by the respondents in terms of staff uniforms, plane’s atmosphere and various gadgets provided on board.

“First of all, it is very clean. You know I am the kind of person that does not feel comfortable with those head rest things. But every single time, those head tissues things are changed, I mean it is clean. The staff is well dressed, and they look lovely. The inside of the plane is nice, too. I mean not only clean but they put those TV like things on the plane now, what more would you want?” (KD, Female, 48, Home-maker)

4.2.2.1.4 Situational factors

Situational factors in terms of perceived waiting time and perceived crowdedness were other predominantly discussed topics. Participants shared their negative feelings about the crowdedness of the airport and increased waiting times. They also stressed that online check-in was easily accessible and provided added convenience. Figure 4.6 demonstrates the results for situational factors.

Figure 4.6: Situational factors analysis by number of code for each node



Perceived waiting time is argued to be an important determinant within situational factors. The reasoning behind this view is that as the customers’ perception of the time they have to invest to an alternative service delivery option increases, their motivation to co-produce using SSTs also argued to increase.

There is no longer a check-in line. I think the ground services are no longer important now that we have online check-in...What is the latest time I can arrive

to the airport. Let's say 45 minutes prior to flight. I don't want to be staying there for the 46th minute (İT, Male, 31, Engineer)

Similarly, perceived crowdedness is included as a situational factor since as the perception of the density level of the traditional service setting increases, the customers will lean towards using alternative options such as SSTs to bypass the crowds.

The guy who doesn't want to wait in line with hundreds of people does on-line check-in, that's who? (ÇA, Male, 47, Consultant)

The final leg of situational factors are represented by access convenience. It is defined as the convenience offered in terms of time and location. Through access convenience, it is argued that customers' propensity towards SSTs will increase since they will find SST options fit better with their routines, relieving them from tension caused by location and time.

Instead of getting into that rat race, you do your thing [referring to online check-in] and then go to the other side [referring to passport control]. (NT, Male, 47, Banker)

I mean you have this single button called on-line check-in on the web site. How hard is that? I mean if you want to wait in the line for an hour be my guest, but I wouldn't do that (ÖT, Male, 49, Sales Director)

4.2.2.1.5 Motivation

One of the biggest contributions of the focus group discussions was on the topic of motivation. The participants were not only able to differentiate between extrinsic and intrinsic motivation without any probing or directing, they were also able to generate specific items of extrinsic motivation, which were directly included in the survey instrument on later stages. These topics were prevention from not flying due to over-booking, being able to select a seat of choice, proceeding directly to the gate if the passenger only had a cabin luggage, and being able to credit frequent flier miles automatically to the loyalty card. The sample quotations given below are several of the examples that were mentioned by focus group participants touching upon outer drives that directed their behavior, which is the mirror definition of extrinsic motivation.

I don't want to worry about being able to board the plane. How do I know that they are not going to tell me 'the flight is over-booked, so you won't be able to fly?' But if I do online check-in first, that means I have guaranteed my seat. (EÇ, Female, 32, Teacher)

I don't like it when there is a ton of people of waiting after me in line. 'Should I sit here, should I sit there?' What I do is, I get the image of the plane [referring

to the visual of the plane during seat selection stage of the online check-in process] and then I choose just the one I want. (KD, Female, 48, Home-maker)

Every time I do check-in I forget to mention my loyalty card number to the service personnel. But the system already has my number in. So, I don't have to worry about crediting my mileage to my loyalty card(BA, Male, 48, Technical Officer)

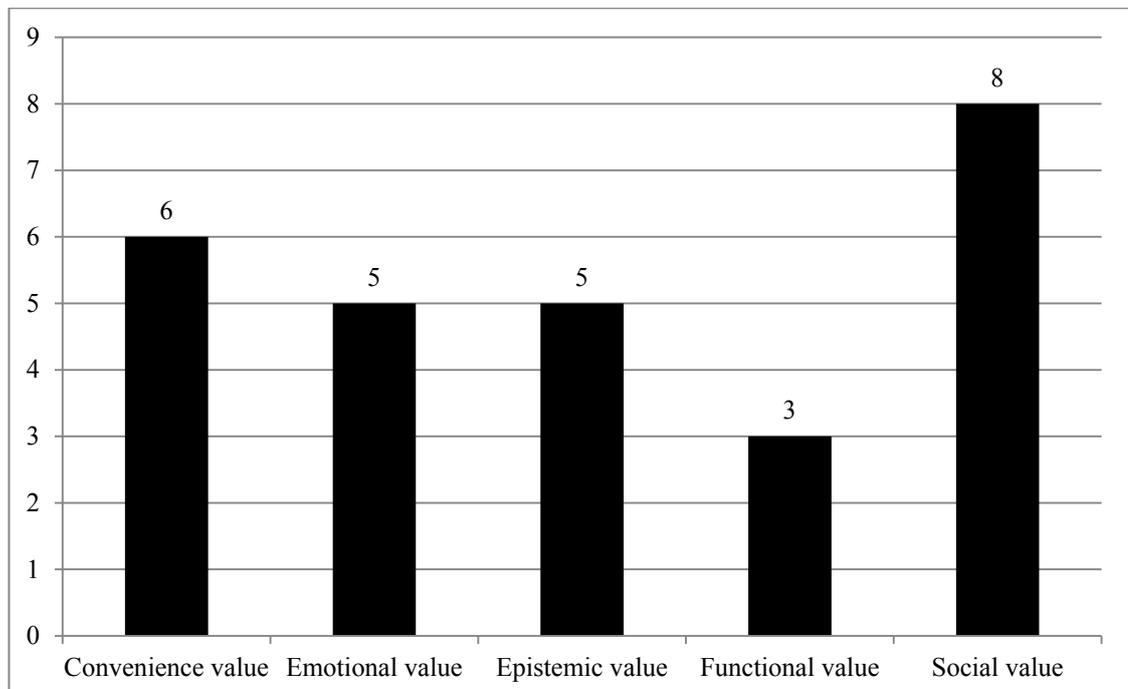
The inner drives that directed subjects towards SST option was also mentioned, which is included under the rubric of intrinsic motivation. The focus group participants mentioned their feeling of enjoyment with online check-in, without ascribing an attributional meaning to it.

I don't know [answering to another respondent], I do it because I like it I guess. I mean it saves time and everything, but I would probably do it anyway. (TC, Female, 27, Home-maker)

4.2.2.1.6 Perceived values

Five distinct perceived values discussed in the literature review section of the study were mentioned during focus groups. Figure 4.7 demonstrates analysis of perceived values. Exemplary quotes of different values as well as the ways such quotes correspond to intended meanings are presented below.

Figure 4.7: Perceived value analysis by number of codes for each node



During focus groups discussions, participants summarized convenience value as “easiness”, which corresponds with the intended meaning of convenience value through this study as the “ease and speed of achieving a task”.

I had no problems what-so-ever. The system works like a bell. Very nice, very convenient. (BA, Male, 48, Technical Officer)

Epistemic value was associated with “curiosity and keeping up with innovations” by the subjects. This view is in line with the definition attributed to epistemic value as this study views curiosity and appetite for knowledge within the boundaries of epistemic value.

You have to keep up with the technology. The first time I did online check-in, I did it out of curiosity. I just wondered what it was all about. (EC, Female, 32, Teacher)

The recurring themes around emotional value was “happy about being able to use” the system, which is fitting with the emotional value described through this study as utility derived from positive affective states that the product generates.

I remember the days when we used ask each other as we were leaving home to go to the airport; who has the passports? Who has the tickets? Now, the times have changed, you don't even think about your ticket anymore. It makes me happy that I can keep up with the whole change thing. I feel competent in a way. (KD, Female, 48, Home-maker)

I am happy with online check-in. Things like this is the bonus of a trip. You feel a sense of contentment or involvement, maybe because I always wanted to work for an airline during college and never got the chance, huh! (DSA, Female, 43, Accountant)

Functional value was synonymized with “practicality and handiness” by the participants. This elucidation corresponds with the definition of functional value within this study as the utility derived from expected performance is defined as functional value.

It is very functional. You intuitively know what to do and which tabs to go to. I mean it has to be functional for people to use it anyway. You can't expect people to hassle with a dysfunctional web page. That would be absurd. (SB, 33, Male, Strategist)

Social value was one of the most discussed topics during focus groups as participants associated it with “prestige”. Such association seems fitting with the definition provided by social value as social approval and the enhancement of self-image among other individuals.

Do you know how this thing got started? It started by 'you don't do online check-in, really? Well, I do!' It was meant as prestige. The guy who wants to be different is doing online check-in. (ÇA, Male, 47, Consultant)

The machine reads the guy's barcode off of his mobile phone and he goes through. Everybody else wonders, how that guy went through without doing anything. At the end of the day, the guy uses it as a symbol of "privilege. (ÖT, Male, 49, Sales Director)

4.2.2.1.7 Future intention to co-produce

Future intention to co-produce over different alternatives of technology was discussed at length. All respondents who expressed their favorable opinion towards checking in online agreed that, they would also use other technological interfaces in the future. Therefore, focus group participants' contributions were used to generate the items that would capture the operational definition given to future intention to co-produce.

This study defines future intention to co-produce as customers' willingness to participate in service production and delivery in the future. During focus group discussions, participants readily offered their ideas about using online check-in in the future.

I would do online check-in on every flight. Why shouldn't I? I mean it works so far. It would be stupid not to benefit from it in the future. (BA, Male, 48, Technical Officer)

I check-in online regularly, and I intend to use it every time I fly. (İT, Male, 31, Engineer)

However, participants were rather reluctant to specifically name various forms of service options that the airline companies offered. The general idea was that they regarded technological interfaces as a big bundle that was utilized on need-basis. Prior to probing on the researcher part, they expressed their views on more of a general format.

It is nice to try out new things. Especially, you are familiar with the company. It gives you a sense of pleasure and capability. I would try out any technology that they put out there. For the convenience, if not, for curiosity. (ÖT, Male, 49, Sales Director)

There are these things...I can't think of their names, out of the top of my head right now [referring to self-kiosk machines], but they are there, you know at the departure halls, you do your own thing. What are they called? Anyhow, doesn't matter. What you are saying is, would I use it or any of it, right? Yes, definitely, whatever it is. I didn't so far, but I would. (KD, Female, 48, Home-maker)

The names of other technologies offered by the airline companies, with the exception of online reservation, was offered by the researcher. In all three focus groups, there was an overwhelming consensus that a passenger, who already used online check-in, would be willing to use other technological interfaces offered by airline companies. Only one of the participants readily offered his view on online reservation as he argued:

I have done other things before. I have made a reservation online. It went without a hitch and I would be willing to do it again. (ÇA, Male, 47, Consultant)

Other participants only offered their views of future intention after the names of other technological interfaces were revealed by the researcher. As explained previously, online check-in was *the* technological interface that was in the evoke set of participants, which they were ready to offer their positive intentions towards. Nevertheless, when other technological possibilities were listed, they all agreed they had intention to use whatever technology came their way in the future without being too specific on the technology.

The most important thing is for them to tell me how it works and why I should use it? If it has an added advantage for me, of course I would use anything. (ÇA, Male, 47, Consultant)

The insight gained through focus group discussions are important especially for researcher generated scales (Bryman 2008). They offer insight on areas of focus, which need to be included as indicators in order to measure the construct properly (Nassar-McMillan et al. 2010). The focus group discussions regarding future intention to co-produce showed participants were ready to offer their ideas on their future intentions. They also grasped and agreed that there would be other technological interfaces (without providing specific names) that could be offered by the airline company which they would be willing to use in the future. Nonetheless, they were unable to easily recall the names of the technological interfaces. Therefore, the in-depth interview findings conducted with airline executives were utilized to generate the remainder of the questions for this scale. The technological interfaces shared and explained by airline executives to the researcher were offered to focus-group participants, and they were further probed on their future intentions regarding the mentioned interfaces.

The in-depth interviews, carried out with airline executives prior to focus groups, had showed that there were different technological platforms, which the customer could

collaborate with the airline company to produce the offering. These platforms included mobile applications, self-kiosk machines, and online reservation systems. Accordingly, these platforms were incorporated in the generated scale to ensure that the scale captured all aspects of customers' true intentions for the future rather than falling short of measuring a specific interface because the survey respondent fell short of recalling the name of the technological means.

4.2.2.1.8 Attitude towards co-creation of value

As mentioned previously, there are many reasons for including exploratory phase in a research. One of these reasons is to uncover salient issues about an under investigated phenomenon (vom Brocke et al. 2009). Co-creation of value representing such phenomenon benefited greatly from the ideas expressed during focus group sessions. As participants eagerly discussed different ways an airline company could contribute to the value of their trip, they also exchanged ideas about how an airline company could go about creating platforms or simply ways to add to value-in-use. The two way communication, the tools that could be utilized during such communication, and the results such communication would breed in terms of increased value were discussed intensively during focus groups.

The first common theme during focus group discussions were the ruling idea that the airline companies had a sufficient level of expertise that would and could, given that it was offered by the airline company and accepted by the customer, increase the value of a passenger's trip.

They already have an army of staff all over the world. They are living their lives there, you know. Even if they don't, I mean, is it easier for an airline to get that information, or is it easier for me or you? (BK, Female, 37, Psychologist)

I believe all airlines have tremendous knowledge on the destinations they are flying. I don't think they would consider a flight otherwise. You and I are planning a trip for a couple of days and doing a bunch of research online to find out where to go, what to do. I can't image otherwise, no way. (AK, Female, 36, Lawyer)

Although, there was a consensus on the level of expertise airline companies held, some of the participants questioned the reason why the companies would share such information since such effort may go beyond the scope of their responsibilities.

They are probably going to think, what is in it for me, right? I mean why would they do it? They are not a travel agency after all. Do they want to get involved in our trip? Does it matter how much fun you have when you are there? Is it their responsibility? (ÇA, Male, 47, Consultant)

While others expressed their feelings that such involvement would create an added value to the trip, and the passengers would benefit from it.

What I am saying is what if an airline said 'I am not only flying you from here to there, but I am working towards you having a better time. I will get you the best hotel at a good price, dinners, concerts, whatever the passengers want, you would think that 'I should fly with them, they help me with everything. (BA, Male, 48, Technical Officer)

Another consensus reached was that regardless of the type or amount of expertise companies held, it would require willingness on parties (both companies and customers) to communicate in order to get such expertise through as well different ways how such communication would be carried out.

What you are saying is [answering to the comments of another participant], we should be in communication all the time. I tell them what I would like, and they come up with a solution. Maybe, later on, I wouldn't even need to tell them what I want, and they come any say 'Hey, maybe you are not aware, but you have such and such options. Do you want to do these? These are great activities for kids!' Of course I would listen and respond, they are working towards my benefit. (KD, Female, 48, Home-maker)

Oh, the only thing that stands between us [referring to the passenger and the airline company] is their willingness to provide you added value. There can be direct communication. There can be blogs, or many other things. At this time and age, no company can say "I don't know how to communicate" or "I don't have a way to communicate with my client". It just depends on how committed they are to their passengers. (DSA, Female, 43, Accountant)

In all three focus group discussions, mutual agreement was reached on the fact that commitment on both sides could enrich total travel experience.

The airline can easily initiate such a thing, especially on social media. It doesn't have to be, but then it would be instant you know. They contribute to your trip, and maybe in return you give back to contribute to somebody else. (DSA, Female, 43, Accountant)

It's like a huge big community but in constant communication, you mean [responding to another participant]. Can you image the publicity for the airline? And how much easier planning a trip would be, right? (KÜ, Female, 34, Teacher)

It could be like those sites, you know 'trip advisor' right? It is just that the moderator will be the airline. (ÖT, Male, 49, Sales Director)

The focus group findings indicated that, airline's expertise could increase the value passengers derived from their trip. The expertise needed to be communicated to the

customer, which could only be achieved if all parties were willing to be in contact during and after the actual trip. As a result, the connection mentioned would breed a sense of community, which the customers would be willing to give back to fellow customers.

The transcription and analysis of focus group findings were carried out concurrently, which finalized the exploratory phase of the study. The findings of this phase were utilized to generate the research instrument for the pilot study.

4.3 RESEARCH INSTRUMENT

Following Churchill's (1979) paradigm to develop better measures for constructs, the research instrument for the study was developed through adapted items from the literature as well as researcher-generated items relying on previous studies and analysis of exploratory fieldwork. The items of the research instrument were held subject to validity and reliability assessment before distribution.

4.3.1 Specifying the Domain of the Constructs

A construct is defined as the concept, attribute, or variable, which is the target of measurement (Haynes et al. 1995). Specifying the domain of the construct generally relies on theoretical basis. In other words, the domain of the construct, that is breeding its definition, is founded on a theory and supported by previous empirical findings (Malhotra 2010). Hair et al. (2006, p. 136) specify that "the theoretical definitions are based on prior research that defines the character and nature of the concept". As explained in the literature review section of this study, it is extremely important for the researcher to comprehend and internalize related literature as well as previous empirical findings to define the constructs fittingly with the aim of the study. The researcher needs to keep in mind that the validity of the research relies mainly on the conceptualization of the constructs (Churchill 1979).

This study relies on the premise of Service Dominant Logic (SDL) (Vargo and Lusch 2004a). As explained by Randall (2007, p. 6), SDL is a pristine area of study, still lacking "a theoretical model, operationalized constructs and theoretical relationships between the constructs". Although SDL is thought to rely on solid

conceptualization even one that holds the promise to breed a general theory of marketing in the near future (Bolton 2006, Vargo and Lusch 2006, Vargo and Lusch 2004a, Vargo and Lusch 2004b), Bagozzi and Phillips (1982) argue that conceptual thinking for a theory is crucial, but insufficient. They further assert any theory that is not testable is deemed as incomplete. Yet, theories are only testable when they are operationalized as the operational definitions are the vital bridges between conceptual thinking and observable data (Churchill 1991). Therefore, as suggested by Churchill (1991, 1979), and Bagozzi and Phillips (1982), this study relies on thorough review of relevant literature in order to define its constructs, all the time being aware that it is only through true definition of the constructs, the researcher will be able to generate items that will adequately measure them.

Consequently, it concentrates on the domain of SDL in order to explain the co-production process. Its scope covers the antecedent conditions in terms of operant and operand resources of different parties that will ignite the process of co-production. Furthermore, it regards the service to be co-produced as an integral part of the process from the beginning, and subsequently, includes necessary antecedent conditions belonging service to be co-produced. Moreover, as no party in the market operates in a vacuum, it concentrates on the situational factors that serves as the precedent of shaping customers' motivation to co-produce.

The scope of the study extends beyond the attempt to explain co-production process since, as novel as it may be (Randall 2007), explaining the co-production *per se*, has very little to offer for the domain of SDL. SDL regards value created in-use to be superior over the value created in production. Consequently, this study attempts to link co-production outputs with co-creation of value in order to shed a light on the process of value creation as a whole.

4.3.2 Item Generation

Generating the sample items for the survey instrument is the second stage recommended by Churchill (1979). As the researcher reviews the literature, the aim is not only to capture the essence of each construct in order to reach at true definitions but also to locate reliable existing scales that may be integrated into the pool of items.

This study uses various items from existing literature that demonstrates high reliability and validity scores. It adapts existing items to the context of the study where necessary. It also utilizes the findings of the exploratory stage to generate items in order to measure the intended definition of the constructs, in instances, in which the existing scales are deemed inadequate by the researcher. Appendix D.1 details the operational definitions of the scales used and their sources.

The first set of customer linked factors consists of different capacities. Expertise capacity was measured with six items, five of which were adapted from Meuter et al.'s (2005) study, that measured previous experience and ability, and the last item was researcher generated. Customer capacities related to risk taking were gathered from Bachmann's (2010) scale of risk propensity for all three items. The last capacity, namely resource capacity, consisted four items, all of which were researcher generated, as such construct has never been measured before.

The constructs that make up the individualistic characteristics of customer linked factors as antecedent conditions are need for interaction and Technology Readiness (TR). Need for interaction items are based on Dabholkar and Bagozzi's (2002) study. TR is a multi-dimensional construct with four dimensions introduced originally by Parasuraman (2000). Innovativeness items are based on Parasuraman's (2000) and Heide and Olson's (2011) work. The second dimension, namely optimism, consists of three items, two of which are adapted from Parasuraman's (2000) original work and a single item adapted from Liljander et al. (2006). The third dimension, discomfort is measured with four items. One of the items was based on the original scale from Parasuraman's study (2000), two others were adapted from Meuter et al.'s (2005) technology anxiety measure, and the last item was researcher generated. The final dimension labelled skepticism is measured by four items based on the 2000 study of Parasuraman.

Service linked factors contained the dimensions originally proposed as innovation characteristics (Rogers 1995, Rogers 1962). The items for compatibility, relative advantage, and observability; each contained three items, which were adapted from Meuter et al. (2005). Two of the items measuring complexity also belonged to Meuter et al.'s (2005) and the third item for complexity was researcher generated. The final

dimension of service linked factors was trialability, made of three items, all of which were generated by the researcher.

The final leg of the proposed SDL trivet was company linked factors. Communication quality and service quality formed company linked factors. Measure of communication quality was gathered from the study of Wu et al. (2012). The different dimensions of service quality consisted of 22 items, all of which, except a single item, belonged to widely cited measure of Parasuraman et al. (1988). Single item that belonged to the dimension of assurance was researcher generated.

The last set of antecedent conditions was situational factors. Access convenience consisted six items, two of which were adapted from Collier and Sherrell's (2010) study, and the remaining four were self-generated. Perceived crowdedness and perceived waiting time each consisted three items. Two of the perceived crowdedness items were gathered from Gelderman et al. (2011), and the remaining four items were researcher generated.

Four items of the role clarity scale were taken from Meuter et al. (2005), and the remaining two items were researcher generated. Items measuring enjoyment were adapted from Dabholkar and Bagozzi (2002) study.

Motivation was measured through items that belonged to both extrinsic and intrinsic motivation. Extrinsic motivation measure was made of seven items, two of which were adapted from Meuter et al. (2005), and the remaining five were researcher generated. Intrinsic motivation scale consisted five items, all but one belonged to Meuter et al. (2005). The single item was adapted from Oghazi et al.'s (2012) study.

Attitude towards using self-service technologies was a four item scale, measured with three items of Oghazi et al. (2012) and a single item from Bock et al. (2005). Intention to co-produce scale consisted three items in total, two of which were adapted from Pura (2005) and a single researcher generated item. Similarly actual co-production behavior was measured with a single item generated by the researcher.

The study consisted five distinct values as mediators between actual behavior and satisfaction. Total of three items of functional value, three items of convenience

value, and two items belonging to emotional value were researcher generated. Remaining two items of emotional value and a single item for convenience value were gathered from Pura et al. (2005). Similarly, three items of each epistemic value and social value were adapted from Pura et al. (2005). The last two items of social value were gathered from Laio and Lu (2008).

The remaining three constructs were satisfaction, future intention to co-produce and attitude towards co-creation of value. Satisfaction measure consisted four items, one of which were researcher generated, and the remaining three belonged to Sieders et al. (2005) study. Future intention to co-produce was a five item and attitude towards co-creation of value was a fifteen item constructs, in which all the items were generated by the researcher.

4.3.3 Purifying Measures

Churchill (1979) identifies the subsequent stage in a research as the step for purifying measures. Measure purification is a multi-stage process to ensure the validity and reliability of the survey instrument before advancing to the main study.

Hair et al. (2006, p. 137) define validity as “the extent to which a scale or set of measures accurately represent the concept of interest”. In order to ensure validity, the researcher must first present content validity, alternatively named face validity. The main goal trying to be achieved through face validity is to make sure that items proposed not only covers the domain of the construct but also includes theoretical and practical considerations (Robinson et al. 1991, Churchill 1979). Content validity is inherently a subjective (Malhotra 2010), yet a necessary evaluation carried out by expert judges in order to advance to further development of the questionnaire. According Hair et al. (2006) the construct validity is another important indicator that comes in the form of convergent, discriminant, and nomological validity, which should only be established after the scales are demonstrated to be reliable (Peter 1981, Campbell and Fiske 1959).

Reliability is defined as the assessment of degree to which a scale produces consistent results when measurements are repeated (Peter 1979). Therefore, reliability is an assessment of consistency. According to Hair et al. (2006), there is no single perfect way of assessing reliability, but the coefficient alpha is the most common method of

assessment. Coefficient alpha, alternatively named as Cronbach's alpha, is assessment that regards all possible ways of splitting the scale items to demonstrate how fittingly the items measure different aspects of the construct (Nunally 1978).

The subsequent sections will further articulate evaluation of content validity under qualitative and evaluation of reliability under quantitative assessment sections.

4.3.3.1 Qualitative assessment

According to Peter and Churchill (1986, p. 1) the first step in developing a measure is "non-empirical analysis", which comes in form of qualitative assessment. Content validity ensures that theory and literature driven items as well as those that have emerged as a result of the exploratory analysis capture the essence of the construct of interest (DeVellis 1991).

As noted in the previous sections, the exploratory phase of the study played a crucial role in researcher's quest for determining items that would capture the essence of each construct. Although thorough literature review helped the researcher to locate scales with high reliabilities, it was only after focus group findings that the items for each scale were finalized.

The finalized items for the survey were translated to Turkish by the researcher and a bilingual member of the academia. The two version of the translation were evaluated in order to make necessary revisions. The revised version of the questionnaire was then sent to two academic expert judges for evaluation of face validity.

The judges commented on several issues and suggested amendments. The first issue noted was the translation of some of the items being too literal. Judges recommended that the researcher should emancipate herself from the boundaries of semantics and concentrate on what each item was truly designed to capture. The second issue raised was the heavy wording on some of the items as well as the length of the sentences. Both judges suggested simplifying some of the items in wording and in length to ensure comprehension of the items by the respondents. Final comment in qualitative assessment was the suggestion to avoid the use adjectives unless it was deemed necessary.

In light of judges' comments, the amendments were made in wording and word count of each item, and the revised draft of the questionnaire was prepared for the pilot study.

4.3.3.2 Questionnaire design for the pilot study

Online method of data collection is used for this study. As the specifications required by online data collection methods will be delineated in the next section, only the design for the pilot study will be articulated below.

The questionnaire for the pilot study opened with a screen explaining the aim of the study and ensured that the information that participants have provided would be treated anonymously and used no other purpose than provided in the opening screen.

The pilot survey started with a control question in order to understand if the online check-in was conducted for self or for another passenger. Regardless of the answer, the respondents could continue with the survey questions.

The pilot study consisted 180 questions in total and was distributed among 22 different screens. The 13th screen was a page notifying the respondents that they were over the half way mark, and that it would take several more minutes to complete the survey. The survey closed with the 23rd screen. The respondents were thanked for their valuable time and contribution.

4.3.3.3 Method for the pilot study

Online data collection is an increasing trend in all research areas due to its obvious advantages. As the specific context of the study was online check-in system, the online data collection method was deemed appropriate.

Ahern (2005) points to various advantages of online data collection as being less expensive, being able to reach a large pool of potential respondents, increasing access to issues that are in sensitive nature, increased methodological rigor and control, and increased accuracy in data entry. In many cases such as this study, the data is transferred already coded and was ready for analysis. Furthermore, she asserts there are several advantages of online methods to respondents such as increased anonymity, freedom to move at their own pace when completing the survey, increased control as well as

willingness to participate due to its novel nature and most importantly its ease of use (Ahern 2005).

Hanscom et al. (2002) similarly point out that missing value rate of online surveys is nearly half as opposed to paper surveys, making online surveys superior to traditional methods in completeness as well as consistency. However, several issues need careful considerations when conducting an online survey.

In line with Manfreda et al.'s (2002) suggestions, the online survey started with an opening page. The font used was simple and large for easy reading as suggested by Hanscom et al. (2002) and natural and pale colors were used as background as advised by Klein (2002). Following Manfreda et al.'s (2002) suggestions the respondents were not given the chance to work on several pages at a time but were limited to work with a single page. The layout of the page was designed in a way that it took only a single scroll to reach at the end of the page and the clearly delineated "back" and "next" buttons were placed at the end of each screen as recommended by Manfreda et al. (2002) and Hanscom et al. (2002). The respondents were not required to answer every single question, and were given the option to skip as they pleased. Hanscom et al. (2002) argue that such approach ensures very high completeness. Otherwise, a question that was not clear to the respondents or one that they perceived to be too sensitive urge them to quit the survey. Following Klein's (2002) recommendations, once the survey was completed, respondents received an immediate acknowledgement.

4.3.3.4 Target population and sampling for the pilot study

As the aim of the study was to investigate co-production in SSTs using the context of online check-in, passengers that have used the online check-in made up the target population. The survey was conducted via a major Turkish airline's web-page. As the passengers completed their online check-in, a notification banner for the survey was provided at the bottom of the page, giving the passengers the option to participate. No incentive was provided. The respondent had the option to take the survey or to exit the page without taking part.

The sampling technique was convenience sampling as each element in the population did not have equal chance of being selected but were "simply at the right place, at the

right time...for self-selection” (Malhotra 2010, p. 377). Although, generalizability of the findings are questioned as the researcher moves away from probabilistic sampling, Couper (2000) argue that probabilistic sampling is almost impossible in online methods since respondents that participate are inherently different from the general population (Couper 2000). The obvious reason for this argument is that respondents need to have tools to take an online survey such as a computer or an Internet connection. Nonetheless, as the context of this study already limits the sampling frame to those who are already using an online check-in system, and the context of the study being a pure online operation, online data collection technique was deemed appropriate (Topp and Pawloski 2002).

4.3.3.5 Sample size for the pilot study

The sampling process started with target population figures obtained from the airline. The sample size for the pilot study was determined following Hair et al.’s (2006, p. 113) “rules of thumb”. The pilot study was ended after 226 usable surveys were reached. The sample size of 200 was deemed sufficient as it fulfilled Hair et al.’s (2006, p. 113) recommendations for conducting exploratory factor analysis by housing:

- i. At least five variables for each proposed factor,
- ii. Sample having more observation than variables, and
- iii. Absolute sample size exceeding fifty observations.

4.3.3.6 Quantitative assessment of the pilot study

The first step in quantitative assessment is data preparation. One of the clear advantages of online data collection method, which will be further discussed in section 4.4.1 is that the data of online surveys are transferred already coded. Ahern (2005) asserts this as one of the clear benefits of online data collection method. Consequently, the data preparation stage commenced with data cleaning as suggested by Malhotra (2010).

Data cleaning started with skimming through answers to identify logically inconsistent and extreme values. 12 cases were deleted as a result of this stage, due to logically inconsistent answers. The cases with answer to control question indicating the online

check-in was completed for another passenger were also excluded from the study, which were 8 cases in total.

Next, missing value analysis was conducted through “a four-step process for identifying missing data and applying remedies” as recommended by Hair et al. (2006, p. 53).

The acceptable extent of missing data per individual case and per individual observation is 10 percent (Hair et al. 2006). In line with Hair et al.’s (2006) suggestions on percentage of missing data, 14 cases with missing values over 10 percent were deleted. When the missing data is below 10 percent, the next action is to perform the Missing Completely at Random (MCAR) test to diagnose the randomness of the missing data. This is an important step to assess if missing data is distributed randomly (Hair et al. 2006) since non-random missing data may suggest problems with specific questions, that need to be addressed before advancing to main study. Therefore, the remaining 192 cases were tested for randomness of missing data.

The significance level of the MCAR test ($0.378 > 0.05$) showed no significance between the pattern of observations with missing data and expected pattern of the missing data. This result confirmed that the data was missing in a random manner suggesting that they could be replaced with mean substitution or regression imputation (Hair et al. 2006).

The widely used method of imputation of missing data is mean replacement. Hair et al. (2006) recommend this method especially in cases where the missing data levels are relatively low. Therefore, the missing values were imputed by mean substitution. As the main aim of the pilot study is to assess the factor structure and evaluate reliability, exploratory factor analysis (EFA) was conducted next for each of the constructs.

The main assumption behind factor analysis is the one that there is an underlying structure among variables, and such structure will present itself through correlations (Hair et al. 2006). Accordingly, variables that are highly correlated with each other yet still independent from other variables form a factor (Tabachnick and Fidell 2007).

There are three main assumptions necessary to perform a factor analysis. First, there should be strong conceptual foundation that the variables will form a structure. Second,

a statistically significant correlation will exist between variables, represented by Bartlett's test of sphericity (sig. <0.05). Finally, each variable and the overall test values will exceed 0.50 cut-off point, when tested for Kaiser-Mayer-Olkin Measure of Sampling Adequacy (KMO) (Hair et al. 2006).

There are several decisions that are needed to be made before proceeding with factor analysis, which are selecting a factor method, specifying factor matrix and selecting rotational method (Tabashnick and Fidell 2007).

When the aim of the factor analysis is to form variable structures in which the variables share high correlations with one another from different sets, the first point to regard is how much of the variable's variance is shared with other variables in the same factor. As variance represents the dispersion of values from the mean, the highly correlated variables naturally shares a variance with other variables of the same factor (Malhotra 2010, Hair et al. 2006).

The most common measure for portioning the variance of a variable is assessing its communality, which is the estimate for shared variance of the variable of the same set of factor, which is labeled as the common variance (Tabachnick and Fidell 2007).

The second step in factor analysis is the selection of rotational methods, which is the criteria for the number of factors that will be extracted. Review of multivariate analysis literature suggests the decision of selecting the number of factors that will be retained, lies on several important issues, which Hair et al. (2006, p. 122) summarize as:

- i. Factors with eigenvalues greater than 1.0,
- ii. Conceptual foundation on how many factors the variables will lead,
- iii. Adequate factors that exceed the threshold level for percentage of variance explained, usually 60 percent or higher, and
- iv. Factors with substantial amount of common variance.

In light of the theoretical issues explained above, the exploratory factor analysis (EFA) was performed on 192 cases. The latent root criterion level (Eigenvalue >1.0) was used to determine the factor structure. Items with communalities and factor loadings less than

0.50 were excluded or reworded by the judgment of the researcher. Items that loaded on more than one factor, as well as factors with single items were dropped using judgment.

Next, the reliability levels of computed factor solutions were assessed. Reliability is the assessment of consistency between repeated measurements (Tabachnick and Fidell 2007). There are two important diagnostics in reliability assessment. First, is the item-to-total correlation for summated scales and inter-item correlation between variables (Robinson et al. 1991). The suggested threshold levels are 0.50 for item-to-total correlation and 0.30 for inter-item correlation (Hair et al. 2006). Second is the reliability coefficient, alternatively named as Cronbach's alpha (Cronbach 1951), that determines the consistency of the entire scale, which should exceed 0.70, but 0.60 is an acceptable level for exploratory research.

Finally, issues related to assessment of validity were addressed using rules-of-thumb advised by Hair et al. (2006). In order to conclude in sufficient convergent validity, factor loadings of the items were used. Hair et al. (2006) assert that an indicator of convergent validity is strong factor loadings, which are above the 0.50 level. Furthermore, average factor loading for a specific construct that exceeds 0.70 threshold level is an accepted indicator of convergent validity (Hair et al. 2006).

Discriminant validity is the assessment of the extent to which different constructs are distinct from each other. During EFA, accepted practice for assessment of discriminant validity is through factor correlations matrix. The threshold level of 0.70 in factor correlation matrix suggests that shared variance of the factors cannot exceed 50 percent as shared variance is the squared correlations between factors (Hair et al. 2006).

Table 4.2 summarizes the results of the initial factor structures and reliability assessments of the pilot study. Details of each assessment are provided subsequently.

Table 4.2: Initial factor analysis and reliabilities of the pilot study

Construct	Number of items	Number of factors	Number of factors suggested by literature	Cronbach's alpha
Capacities	13	3	*	
Expertise capacity	6	1	1	0.941
Resource capacity	4	1	*	0.796
Risk-taking capacity	3	1	1	0.819
Individual characteristics	20	5	5	
Need for interaction	4	1	1	0.821
Optimism	3	1	1	0.816
Innovativeness	5	1	1	0.877
Discomfort	4	1	1	0.780
Skepticism	4	1	1	0.730
Service linked factors	15	4**	5	
Compatibility	3	1	1	0.972
Relative advantage	3	1	1	0.833
Trialability	3	1	1	0.751
Observability	3	1	1	0.832
Complexity	3	1	1	0.881
Company linked factors	27	5	6	
Communication quality	5	1	1	0.950
Service quality	22	4 ***	5	0.944
Situational factors	12	3	3	
Access convenience	6	1	1	0.842
Perceived crowdedness	3	1	1	0.919
Perceived waiting time	3	1	1	0.824
Moderating variables	9	2	2	
Role clarity	6	1	1	0.874
Enjoyment	3	1	1	0.889
Motivation	12	3****	2	0.878

Table 4.2: Initial factor analysis and reliabilities of the pilot study (cont'd)

Perceived values	19	4*****	5	
Functional value	3	1	1	0.856
Social value	5	1	1	0.951
Emotional value	4	1	1	0.929
Epistemic value	3	1	1	0.905
Convenience value	4	1	1	0.920
Satisfaction	4	1	1	0.909
Attitude & Intention towards co-production	7	2	2	
Attitude	4	1	1	0.898
Intention	3	1	1	0.945
Future intention to co-produce & attitude towards co-creation	20	3	*	
Future intention to co-produce	5	1	1	0.836
Attitude towards co-creation	15	2	*	0.963

* There are no scales of resource capacity and attitude towards co-creation in the literature, therefore number of suggested factor do not exist.

** Service linked factors based on innovation characteristics of Rogers' work (1995, 1962) produced a four factor solution, rather than expected five factors.

*** The suggested number of factors for SERVQUAL (Parasuraman et al. 1988) is five, yet the initial factor analysis produced four factor solution.

**** Motivation was divided into three separate factors, rather than two expected factors of extrinsic and intrinsic motivation.

***** Perceived values emerged into four factor solution rather than expected five factors.

All six items of expertise capacity loaded on the same factor. The factor loadings ranged between 0.796 and 0.917, with Cronbach alpha level of 0.941. Additionally, two items from resource capacity measure merged under the expertise capacity factor with below acceptable loadings. Researcher opted against deleting the items instead reworded them using her own judgment.

Construct of resource capacity was defined and operationalized by the researcher. Literature review shows no previous studies that bears the construct of resource capacity. Resource capacity is four item scale. However, after the EFA only two of the four items merged under the resource capacity construct. The factor solution of the construct and its reliability showed above acceptable levels. Kaiser-Mayer-Olkin Measure of Sampling Adequacy and Cronbach's alpha were both above threshold levels. (KMO = 0.882 and Cronbach's alpha = 0.796). This result encouraged the researcher to keep such novel construct for the main survey instrument.

Risk-taking capacity formed a unique factor with all three items theorized with factor loadings ranging between 0.824 and 0.904, with Cronbach alpha level of 0.819. Table 4.3 summarizes the EFA results for customer capacities.

Table 4.3: Exploratory factor analysis for customer capacities

Factors and related items	Factor	Cronbach Alpha
Expertise capacity		
I commonly use technological systems in my daily life	0.796	0.941
I am capable of using technology	0.917	
I am confident in my ability to use technology	0.896	
My previous experience enables me to use technology more	0.901	
I am confident in my knowledge on technology	0.818	
I use variety of technological products and services	0.816	
Resource capacity		
I have all the necessary technological devices that will make my	0.841	0.796
I am online all the time	0.802	
I obtain technological devices that I am missing instantly		
If the technological devices that I use gets out of order, I get it serviced right away	*	
Risk-taking capacity		
I always try to avoid situations involving a risk of getting into	0.824	0.819
I always play it safe even when it means occasionally losing out on	0.904	
I am generally a cautious person in my actions	0.843	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.882		
Total variance explained: 73.88%		
Bartlett Test of Sphericity: 1803.764 p: 0.000 < 0.05		
* Two items of resource capacity merged with expertise capacity with factor loadings below 0.50. The items were reworded and retained.		

In the assessment of convergent validity, it was concluded that all factor loadings of customer capacities exceeded 0.50 level, with average loadings above 0.70 suggesting that convergent validity was established. The results of the convergent validity assessment for customer capacities are presented in Table 4.4.

Table 4.4: Convergent validity through factor loadings for customer capacities

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Expertise capacity	✓	0.857
Resource capacity	✓	0.822
Risk-taking capacity	✓	0.857

Furthermore, factor correlations matrix demonstrated that the highest shared variance is 18.06 percent between risk taking and expertise capacity, which is considerably lower than the 50 percent threshold level. Shared variance between resource capacity and expertise capacity as well as risk-taking capacity and resource capacity is less than 0.02 percent. Table 4.5 presents assessment of discriminant validity.

Table 4.5: Discriminant validity through factor correlation matrix for customer capacities

Factor correlations			
Expertise capacity	1.000		
Resource capacity	0.014	1.000	
Risk-taking capacity	-0.425	0.003	1.000

Individual characteristics is made of a uni-dimensional construct of need for interaction and a multi-dimensional construct of TR. EFA of individual characteristics resulted as conceptualized. All factor loadings were well above acceptable level of 0.50 with reliability levels ranging from 0.730 through 0.877. Table 4.6 summarizes EFA results for individual characteristics.

Table 4.6: Exploratory factor analysis for individual characteristics

Factors and related items	Factor loadings	Cronbach Alpha
Need for interaction		
Human contact in providing services makes the process enjoyable for me	0.780	0.821
It bothers me to use a machine when I could talk to a person instead	0.728	
I like interacting with the person who provides the service	0.902	
Personal attention by the service employee is important to me	0.797	
Optimism		
Technology gives me more control over my daily life	0.781	0.816
Technology gives me more freedom of mobility	0.708	
Products and services that are the newest technologies make my life much more efficient	0.767	
Innovativeness		
Other people come to me for advice on new technologies	0.804	0.877
I am among the first in my circle of friends to acquire new technology when it appears	0.766	
I can keep up with the latest technological developments in my areas of interest	0.637	
Compared to other people, I know a lot more about new technologies	0.878	
I consider myself an expert on technological products	0.844	
Discomfort		
I feel intimidated by technology	0.744	0.780
Sometimes, I think that technological systems are not designed for use by ordinary people	0.647	
I feel apprehensive about using technology	0.766	
I am overwhelmed by how complicated technological systems may be	0.750	
Skepticism		
If I provide information to a machine or over the Internet, I can never be sure it really gets to the right people	0.602	0.730
Any business transaction I do electronically should be confirmed later with some writing	0.799	
Whenever something gets automated, I need to check carefully that the machine or computer is not making mistakes	0.802	
I worry that information I send over the Internet will be seen by other people	0.647	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.797		
Total variance explained: 66.76%		
Bartlett Test of Sphericity: 1790.070 p: 0.000<0.05		

Table 4.7 demonstrates that all items of individual characteristics constructs converge on their expected factors. This can be concluded through the fact that the factor loadings of each item is above the threshold level of 0.50. Furthermore, the average factor loading of the items constituting the factors are above the cutoff point of 0.70.

Table 4.7: Convergent validity through factor loadings for individual characteristics

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Need for interaction	✓	0.802
Optimism	✓	0.752
Innovativeness	✓	0.786
Discomfort	✓	0.727
Skepticism	✓	0.713

Furthermore, each factor is discriminant from each other as demonstrated through factor correlations matrix presented in Table 4.8. The highest shared variance among factors is between need for interaction and discomfort with 33.75 percent, which is still below the 50 percent limit.

Table 4.8: Discriminant validity through factor correlation matrix for individual characteristics

Factor correlations					
Need for interaction	1.000				
Optimism	0.153	1.000			
Innovativeness	-0.343	0.117	1.000		
Discomfort	0.581	-0.011	-0.404	1.000	
Skepticism	-0.092	0.233	0.468	-0.040	1.000

Rogers (1995, 1962) has suggested that innovation characteristics is a multi-dimensional construct with five sub-dimensions. Yet, the factor analysis resulted in four factor solution, in which dimensions of compatibility and relative advantage emerged. Taking a closer look at the individual items that made up the constructs, it was concluded that communalities of the items were all above 0.5. Furthermore, when forced for two factor solution, the individual scale's reliabilities were 0.972 for compatibility and 0.833 for relative advantage. In order to address the issue, the researcher went back to the original items and decided to keep all of the items by using

theory derived judgment. EFA results for service linked factors are presented in Table 4.9.

Table 4.9: Exploratory factor analysis for service linked factors

Factors and related items	Factor loadings	Cronbach Alpha
<i>Combined factor of compatibility and relative advantage</i>		
Using online check-in system is compatible with my lifestyle	0.864	
Checking myself in online fits well with the way I like to get things done	0.905	
Using online check-in system is compatible with my needs	0.919	0.917
Using online check-in system improves travelling	0.718	
Using online check-in system is more advantageous than other methods of checking in	0.743	
Using online check-in system is the best way to check myself in	0.776	
<i>Trialability</i>		
I would like the opportunity to try out the online check-in system before using it	0.729	
If there was any change in the online check-in system, it would be helpful to try out the new system before using it	0.862	0.751
In case of a change in the online check-in system, it would be good if they would show me how to use the new system	0.823	
<i>Observability</i>		
I would have no difficulty telling others about the advantages of using the online check-in system	0.710	
I could communicate to others about the outcomes of using the online check-in system	0.608	0.832
The advantages of using the online check-in system is obvious to me and others	0.747	
<i>Complexity</i>		
Online check-in system is cumbersome to use	0.876	
It is difficult to use the online check-in system	0.857	0.881
I feel frustrated using the online check-in system	0.908	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.850		
Total variance explained: 69.34%		
Bartlett Test of Sphericity: 2252.481 p: 0.000<0.05		

Next, convergent validity assessment for service linked factors was conducted. Results demonstrated that while factor loadings exceeded 0.50 level, the average factor loading for observability was under 0.70 limit, with average factor loading of 0.688. Since it was the preliminary stages of the study and given the fact that the scale used was a very established one, the researcher decided to keep the items of observability as suggested by Rogers (1995, 1962). Results for the assessment of convergent validity for service linked factors are presented in Table 4.10.

Table 4.10: Convergent validity through factor loadings for service linked factors

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Compatibility & Relative advantage	✓	0.821
Trialability	✓	0.805
Observability	✓	0.688
Complexity	✓	0.880

The assessment of discriminant validity showed that combined factor or compatibility and relative advantage shared a variance of 52 percent with the construct of trailability, which was slightly above the cutoff percentage of 50. Although, through the results of convergent and discriminant validity did not fully meet criteria sought, the results were very close to threshold levels and were interpreted as promising by the researcher going into the main study. Table 4.11 demonstrates the results of discriminant validity assessment for service linked factors.

Table 4.11: Discriminant validity through factor correlation matrix for service linked factors

Factor correlations				
Compatibility & Relative advantage	1.000			
Trialability	0.722	1.000		
Observability	-0.373	-0.444	1.000	
Complexity	0.291	0.286	-0.059	1.000

A similar issue rose with the five dimensions of service quality measure. Although the literature (Parasuraman et al. 1988) suggested that a five factor solution should emerge, the data resulted into four factor solution, in which the items of empathy and assurance loaded on the same factor. One item belonging to the empathy measure showed communality below accepted levels (0.432). Furthermore, reliability analysis showed that one item of tangibles needed to be dropped in order to increase the overall reliability of the scale. Respectively, the two items were deleted. The deletion of items failed to provide five factor solution, yet the reliability of the scale was increased

significantly. Communication quality formed a distinct construct, parting from the dimensions of service quality. The factor loadings of the items were above accepted level of 0.50 and the factor found to reliable with Cronbach Alpha level of 0.950. EFA results are presented in Table 4.12.

Table 4.12: Exploratory factor analysis for company linked factors

Factors and related items	Factor loadings	Cronbach Alpha
<i>Communication quality</i>		
I feel XYZ communicates with me in a timely manner	0.745	0.950
I feel the information provided by XYZ is accurate	0.832	
I feel XYZ provides me all the information that I need to know	0.847	
I feel the information provided by XYZ is adequate	0.818	
I feel the information provided by XYZ is credible	0.826	
<i>Service quality</i>		0.944
<i>Reliability</i>		
When XYZ promises to do something by a certain time, it does	0.746	0.927
When I have problems, XYZ is sympathetic and reassuring	0.649	
XYZ is dependable	0.643	
XYZ provides its services at the time it promises to do so	0.708	
XYZ keeps its records accurately	0.655	
<i>Tangibles</i>		
XYZ has up-to-date equipment	0.831	0.929
XYZ's physical facilities are visually appealing	0.845	
The appearance of the physical facilities of XYZ is in keeping with the type of services provided	0.807	
<i>Combined factor of responsiveness and assurance</i>		
XYZ tells me exactly when the service will be performed	0.613	0.962
I receive prompt service from XYZ's employees	0.681	
Employees of XYZ are always willing to help me	0.724	
Employees of XYZ respond to my requests promptly	0.658	
I can trust the employees of XYZ	0.688	
Employees of XYZ are polite	0.789	
Employees of XYZ are competent in what they do	0.634	
I feel safe in my transactions with XYZ's employees	0.660	
<i>Empathy</i>		
XYZ gives me individual attention	0.812	0.943
Employees of XYZ know what my needs are	0.828	
XYZ has my best interest at heart	0.672	
Employees of XYZ give me personal attention	0.808	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.955		
Total variance explained: 79.91%		
Bartlett Test of Sphericity: 6181.134 p: 0.000 < 0.05		
Note 1: Single item from empathy dimension was deleted due to communality level below 0.50.		
Note 2: Single item from tangibles dimension was deleted due to decreasing effect on reliability.		
Note 3: XYZ will be replaced by the airline's name.		

The assessment of convergent validity for company linked factors showed that the two dimensions of reliability and responsiveness&assurance had average factor loadings below 0.70 level. Yet, as average loadings for the constructs were 0.680 and 0.681, the researcher concluded them to be close to cut-off point of 0.70 and proceeded with discriminant validity analysis. Table 4.13 demonstrates the results of the convergent validity assessment for company linked factors.

Table 4.13: Convergent validity through factor loadings for company linked factors

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Communication quality	✓	0.814
Service quality – Reliability	✓	0.680
Service quality – Tangibles	✓	0.828
Service quality – Responsiveness & Assurance	✓	0.681
Service quality - Empathy	✓	0.780

Through discriminant validity assessment, all factors were concluded to be discriminant from each other. The highest variance shared was between the dimensions of reliability and tangibles with 49.14 percent, which was still below the accepted level of 50 percent. The validity assessment for company linked factors is presented in Table 4.14.

Table 4.14: Discriminant validity through factor correlation matrix for company linked factors

Factor correlations					
Communication quality	1.000				
Service quality – Reliability	0.626	1.000			
Service quality – Tangibles	0.586	0.701	1.000		
Service quality – Responsiveness & Assurance	0.616	0.633	0.553	1.000	
Service quality - Empathy	0.399	0.396	0.452	0.300	1.000

Situational factors made of access convenience, perceived crowdedness, and perceived waiting time were analyzed through EFA. The results indicated all three constructs' factor solutions were in line with theory with high Cronbach Alpha levels ($\alpha_{\text{ACCESS}}=0.842$, $\alpha_{\text{PERCROWD}}=0.919$, $\alpha_{\text{PERWAIT}}=0.824$). Yet, two items of access convenience were deleted due to low levels of factor loadings. Results of EFA of situational factors are presented in Table 4.15.

Table 4.15: Exploratory factor analysis for situational factors

Factors and related items	Factor loadings	Cronbach Alpha
<i>Access convenience</i>		
Online check-in page loads instantly	0.742	0.842
I can complete online check-in from the comfort of my home or office	0.793	
Accessing the online check-in page is easy	0.805	
I can access the online check-in system through every web browser	0.833	
<i>Perceived crowdedness</i>		
The check-in counters at the airport are too crowded	0.891	0.919
The check-in counters at the airport are too busy	0.873	
The airport departure hall is too hectic	0.799	
<i>Perceived waiting time</i>		
Checking in at the counters takes longer than using online check-in	0.605	0.824
If I have not already checked in online, I have to spend more time at the airport	0.771	
Checking in at the counters is the most time consuming way to check-in	0.780	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.808		
Total variance explained: 70.71%		
Bartlett Test of Sphericity: 1407.982 p: 0.000 < 0.05		
Note 1: 2 items of access convenience was deleted due to low factor loadings.		

Convergent validity assessment for situational factors is presented in Table 4.16. The analysis concluded that all three factors' items converged highly on their expected factors. All of the factors' loadings were above the cutoff point of 0.50. Furthermore, the average factor loadings exceeded the 0.70 level.

Table 4.16: Convergent validity through factor loadings for situational factors

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Access convenience	✓	0.793
Perceived crowdedness	✓	0.854
Perceived waiting time	✓	0.719

In order to make assessment on discriminant validity, the factor correlation matrix of situational factors were examined. The results are presented in Table 4.17. The factor correlation matrix showed that the three factors were discriminant from each other with highest shared variance of 37.57 percent between perceived waiting time and perceived crowdedness.

Table 4.17: Discriminant validity through factor correlation matrix for situational factors

Factor correlations			
Access convenience	1.000		
Perceived crowdedness	0.002	1.000	
Perceived waiting time	0.336	0.613	1.000

As stated in the conceptual framework section previously, the use of construct of motivation is almost non-existent in co-production literature with the exceptions of Eastlick et al. (2012) and Meuter et al. (2005) studies. Consequently, some of the items that constituted the scale of motivation were generated based on focus group findings. Yet, the total of twelve items, that measured motivation, loaded on three factors. Three of the extrinsic motivation subdimension, items derived from qualitative phase, showed significantly lower communality levels (<0.50). As a result of the analysis, three items were deleted. Similarly, one item from intrinsic motivation subdimension scale was deleted due to low communality.

The remaining eight items were analyzed and two factor solution was achieved (KMO= 0.801, AVE = 72.27 percent, Cronbach's alpha= 0.878). The first factor, labeled extrinsic motivation, was made of the items derived from the findings of the exploratory study, and the second factor was labelled intrinsic motivation. Both dimensions showed high internal consistency as their reliability levels were above the suggested threshold level of 0.70 ($\alpha_{EXTMOT} = 0.795$, $\alpha_{INTMOT} = 0.906$). The final factor solution of the exploratory factor analysis for the construct of motivation is presented in Table 4.18.

Table 4.18: Exploratory factor analysis for motivation

Factors and related items	Factor loadings	Cronbach Alpha
Motivation		0.878
<i>Extrinsic motivation</i>		
Using the online check-in would provide me with added convenience	0.746	0.795
Using the online check-in would provide me more control over the check-in process	0.733	
Using the online check-in system, I can automatically credit my frequent flier miles by providing my loyalty card number	0.804	
Using the online check-in system, I can proceed directly to the gate, if I don't have luggage to check-in	0.733	
<i>Intrinsic motivation</i>		
Using the online check-in would provide me with personal feelings of accomplishment	0.864	0.906
Using the online check-in would provide me with feelings of independence	0.856	
Using the online check-in would allow me to feel innovative in how I interact with a service provider	0.894	
Using the online check-in would allow me to have increased confidence in my skills	0.905	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.801		
Total variance explained: 72.27%		
Bartlett Test of Sphericity: 909.723 p: 0.000		
Note 1: 3 items from extrinsic motivation and a single items from intrinsic motivation deleted due to communalities below 0.50.		

Assessment of convergent validity for motivation is presented in Table 4.19. According to convergent validity analysis' results, motivation meets the criteria with items loading highly on their expected factors with factor loadings above 0.50 level. Furthermore, the average factor loadings are above 0.70 threshold level.

Table 4.19: Convergent validity through factor loadings for motivation

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Extrinsic motivation	✓	0.754
Intrinsic motivation	✓	0.880

Table 4.20 demonstrates the correlation matrix for intrinsic and extrinsic motivation. The results of correlation matrix show that the shared variance between the two factors is 25.81 percent, which is well below the threshold level of 50 percent.

Table 4.20: Discriminant validity through factor correlation matrix for motivation

Factor correlations		
Extrinsic motivation	1.000	
Intrinsic motivation	0.508	1.000

Analysis of moderating variables resulted in two factor solution as expected. Two items of the role clarity measure was deleted due to low communalities. Remaining items indicated strong factor loadings ranging from 0.777 through 0.904. Role clarity and enjoyment both had reliability levels above the threshold level of 0.70 ($\alpha_{\text{ROLE}} = 0.874$, $\alpha_{\text{ENJOY}} = 0.889$). Table 4.21 summarizes EFA of moderating variables.

Table 4.21: Exploratory factor analysis for moderating variables

Factors and related items	Factor loadings	Cronbach Alpha
<i>Role clarity</i>		
I feel certain I can check myself in online successfully	0.777	
I know what is expected of me when I am checking myself in online	0.853	0.874
The steps in the process of online check-in are clear to me	0.869	
I am sure how to use the online check-in system	0.904	
<i>Enjoyment</i>		
Using the online check-in is fun	0.867	
Using the online check-in is exciting	0.864	0.889
Using the online check-in is interesting	0.860	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.798		
Total variance explained: 81.42%		
Bartlett Test of Sphericity: 1232.590 p: 0.000 < 0.05		
Note 1: 2 items from role clarity was deleted due to communalities below 0.50.		

Role clarity and enjoyment items converged highly on their expected factor with average factor loadings exceeding 0.70. Their average factor loadings were 0.851 and 0.864, respectively. All items loading highly on their expected factors and average factor loadings exceeding 0.70 are accepted to be clear signs of convergent validity. The assessment of convergent validity is presented in Table 4.22.

Table 4.22: Convergent validity through factor loadings for moderators

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Role clarity	✓	0.851
Enjoyment	✓	0.864

The two moderators were concluded to have a shared variance of 29.81 percent because the factor correlation matrix showed the correlation among them was 0.546. Since the shared variance does not exceed 50 percent, the factors were concluded to be discriminant from one another. The assessment of discriminant validity is presented through Table 4.23.

Table 4.23: Discriminant validity through factor correlation matrix for moderators

Factor correlations		
Role clarity	1.000	
Enjoyment	0.546	1.000

The first run of the EFA for perceived values showed a four factor solution rather than five factors expected. Yet, the factor loadings showed that there were cross loadings between items. When one item from emotional value and one item from convenience value that showed cross loadings were deleted, the five factor solution was achieved according to theory. The final EFA showed that the KMO levels and the percentages of the variance explained were all above acceptable levels (KMO= 0.891, AVE = 82.01 percent). Furthermore, the five distinct factors of value had internal consistency levels ranging from 0.856 through 0.951, which are exceptionally high and well above the suggested 0.70 threshold level ($\alpha_{\text{FUNVAL}} = 0.856$, $\alpha_{\text{SOCVAL}} = 0.951$, $\alpha_{\text{EMOVAL}} = 0.929$, $\alpha_{\text{EPISVAL}} = 0.905$, $\alpha_{\text{CONVAL}} = 0.920$). Table 4.24 summarizes EFA results for perceived values.

Table 4.24: Exploratory factor analysis for perceived values

Factors and related items	Factor loadings	Cronbach Alpha
<i>Functional value</i>		
The performance of the online check-in system meets my expectations	0.738	0.856
The online check-in system works properly	0.873	
The online check-in system is functional	0.838	
<i>Social value</i>		
Using the online check-in helps me feel accepted by others	0.866	0.951
Using the online check-in leaves a good impression on other people	0.837	
Using the online check-in gives me social approval	0.840	
People who use online check-in have more prestige than those who do not	0.865	
Using the online check-in is a status symbol	0.818	
<i>Emotional value</i>		
Using the online check-in makes me feel good	0.775	0.929
Using the online check-in gives me pleasure	0.810	
Using the online check-in makes me happy	0.799	
<i>Epistemic value</i>		
I use the online check-in to experiment with new ways of doing things	0.678	0.905
I use the online check-in to test the new technologies	0.799	
I use online check-in out of curiosity	0.777	
<i>Convenience value</i>		
I value online check-in because it is quick	0.892	0.920
I value online check-in because it is effortless	0.914	
I value online check-in because it is practical	0.870	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.891		
Total variance explained: 86.23%		
Bartlett Test of Sphericity: 3441.928 p: 0.000 < 0.05		
Note 1: 1 item from Emotional value and 1 item from Convenience value were deleted due to cross loadings.		

The convergent validity assessment for perceived values are presented in Table 4.25, which demonstrates that all items converged on their expected factors with loadings over 0.50 and average loadings over 0.70 level.

Table 4.25: Convergent validity through factor loadings for perceived values

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Functional value	✓	0.816
Social value	✓	0.845
Emotional value	✓	0.795
Epistemic value	✓	0.751
Convenience value	✓	0.892

Perceived values are concluded to be discriminant from each other as the factor correlation matrix shows no correlations above 0.70 threshold level, suggesting that no two factors share a variance of or over 50 percent. As a result of the analysis, it was concluded that the factors formed through EFA were discriminant from each other, as presented in Table 4.26.

Table 4.26: Discriminant validity through factor correlation matrix for perceived values

Factor correlations					
Functional value	1.000				
Social value	0.333	1.000			
Emotional value	0.608	0.375	1.000		
Epistemic value	0.665	0.415	0.624	1.000	
Convenience value	0.438	0.333	0.608	0.665	1.000

Next, constructs of intention and attitude were analyzed through exploratory factors analysis. Unexpectedly, the items loaded on the same factor. Although conceptual foundations of the two constructs are separate, their conceptual underpinnings may count for the root of the issue. “Intentions have been frequently subsumed under the concept of attitude and no distinction between attitude and intention has been made” because attitudes are usually considered as the “conative component of attitude” whereas in the flip side of the coin, intentions represent the “affective component of

intention” (Ajzen 1985, pp. 288-289). Therefore, it has been proposed that such strong conceptual relationship is the reason for the uni-dimensional solution.

When fixed number of two factors was imposed on the items, two factor solution was achieved as expected. However, some of the items loaded highly on both dimensions. Although cross loadings usually pose problems in terms of high factor correlations, threatening the discriminant validity of the factors, the researcher decided to keep all items related to constructs, since all of the items loaded over the cutoff point of 0.50 and the imposed two factor solution resulted in reliability levels over 0.70 ($\alpha_{ATTIT} = 0.898$, $\alpha_{INTENT} = 0.945$). The final factorial solution showed acceptable KMO and BTS levels (KMO = 0.828; BTS = 1067.675; $p = 0.000$). Table 4.27 summarizes the EFA for attitude and intention to co-produce over SSTs.

Table 4.27: Exploratory factor analysis for attitude and intention to co-produce in SSTs

Factors and related items	Factor loadings	Cronbach Alpha
<i>Attitude towards co-production in SSTs</i>		
Using the online check-in is a good idea	0.653	0.898
I like the idea of using the online check-in	0.926	
I have a positive attitude toward using the online check-in system	0.639	
Using the online check-in is a wise move	0.508	
<i>Intention to use SSTs</i>		
I intend to use online check-in next time I travel	0.857	0.945
I intend to use the online check-in system more frequently in the future	0.891	
Online check-in will be my first choice next time I travel	0.895	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.828		
Total variance explained: 82.855%		
Bartlett Test of Sphericity: 1067.675 p: 0.000		
Note 1: Items were forced to two factor extraction solution		

The analysis of convergent validity showed that the items converged on the factors imposed by the researcher. The factor loadings were above the suggested threshold level of 0.50. The second indicator of convergent validity is the average loadings of the indicators that form a factor and the acceptable level for average loadings is 0.70. As during the EFA, some cross loadings were detected, and the two factor solution could only be achieved when imposed, problems during validity assessment is to be expected.

Not surprisingly, the average factor loading of the items constituting the construct of attitude towards co-production showed below acceptable levels (0.682). Yet, as the level of average factor loading was close to the cutoff level of 0.70, the researcher decided to keep items as they are. Table 4.28 summarizes the results of the convergent validity assessment.

Table 4.28: Convergent validity through factor loadings for attitude and intention to co-produce

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Attitude towards co-production	✓	0.682
Intention to co-produce	✓	0.881

Forcing items to two factor solution in order to separate attitude towards co-production from intention to use, inherently suggests inevitable problems with discriminant validity. As Table 4.29 suggests, the constructs shared a variance of 50.98 percent, meaning the factor correlation was just above the 0.7071 point. Yet, this result was expected, since the reason behind items failing to load on their expected factors to produce a two factor solution was the reason why the indicators were not discriminant factors. However, as the shared variance was just over the suggested threshold level of 50 percent and relying on the fact that the EFA was conducted on the pilot data, the researcher decided to keep the items as they are.

Table 4.29: Discriminant validity through factor correlation matrix for attitude and intention to co-produce

Discriminant validity		
Attitude towards co-production	1.000	
Intention to co-produce	0.714	1.000

One of the distinct contributions of this study is its attempt to investigate the co-production process' consequences through satisfaction. In order to achieve this goal, a relationship between satisfaction and future intention to co-produce as well as attitude

towards co-creation of value has been hypothesized. Consequently, scale of attitude towards co-creation of value has been generated.

The conceptual foundation of the scale lies on literature review and analysis of focus group findings. Findings of this phase indicated that attitude towards co-creation of value was a two-dimensional construct, made of attitude towards increasing value-in-use with the support of the co-production partner (the service provider), and bidirectional communication that would enable conceptualized phenomenon. Although the factor analysis resulted in two distinct factors, two of the items related to communication loaded on the first sub-dimension. The communalities of all factors were above acceptable levels, exceeding 0.50. The KMO and BTS results showed that the factor solutions were satisfactory (KMO = 0.910; BTS = 3936.402, $p = 0.000$). The reliability of the scale of the attitude towards co-creation of value was 0.963, which is very high for a newly developed scale. The sub-dimensions showed very high internal consistencies ($\alpha_{\text{DIMENSION1}} = 0.951$, $\alpha_{\text{DIMENSION2}} = 0.902$). A single item from satisfaction measure was deleted due to low communality level. The reliability levels for satisfaction and future intention to co-produce were 0.909 and 0.836, respectively. Table 4.30 summarizes the EFA results for satisfaction, future intention to co-produce and attitude towards co-creation of value.

Table 4.30: Exploratory factor analysis for satisfaction, future intention to co-produce and attitude towards co-creation of value

Factors and related items	Factor loadings	Cronbach Alpha
<i>Satisfaction</i>		
I am pleased with the overall check-in experience	0.898	0.909
Using online check-in is a delightful experience	0.883	
I am satisfied with the online check-in experience	0.855	
<i>Future intention to co-produce</i>		
I intend to continue using online check-in on every flight	0.706	0.836
I intend to make online reservation in the future	0.674	
I intend to use mobile applications of XYZ in the future	0.821	
I intend to use self-kiosks of XYZ in the future	0.736	
I intend to make use of different technologies XYZ will provide in the future	0.793	
<i>Attitude towards co-creation of value</i>		0.963
<i>Increasing value-in-use with co-production partner</i>		
I would like to take advantage of XYZ 's expertise in order to increase the value of my trip	0.880	0.951
I would like to explain XYZ my idea of perfect trip	0.846	
I would like to receive recommendations from XYZ to increase the value of my trip	0.829	
I would like to pass on my travel experiences to XYZ , so other can benefit from my experience	0.823	
Staying in contact with XYZ helps me receive information from them on my travel destination	0.762	
I would like to co-create best travel experience with XYZ	0.752	
I would like XYZ to support me for me to have a better trip	0.753	
I would like XYZ to present me with different options for me to have a better trip	0.726	
I would like XYZ to try to understand my needs and wants regarding my trip	0.724	
<i>Attitude towards dialog to increase value-in-use</i>		
I would like give feedback to XYZ about the new information I acquire in my travel destination	0.778	0.902
I would like to be exchanging messages with XYZ	0.719	
I would like to exchange ideas with XYZ to enrich my travel experience	0.637	
I would like to respond to messages coming from XYZ to enrich my travel experience	0.728	
Staying in contact with XYZ can enrich my travel experience	0.667	
I would like XYZ to communicate with me to serve me better	0.813	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.910		
Total variance explained: 73.966%		
Bartlett Test of Sphericity: 3936.402 p: 0.000< 0.05		
Note 1: Single item from satisfaction deleted due to communality below 0.50.		
Note 2: XYZ will be replaced by the airline's name.		

The validity assessment for the last set constructs showed sufficient convergent validity. This result was evident through factor loadings exceeding the 0.50 level. Furthermore, the average loading of the indicators were above the 0.70 threshold level. Table 4.31 shows the results of convergent validity assessment carried out for satisfaction, future intention to co-produce and attitude towards co-creation of value.

Table 4.31: Convergent validity through factor loadings for satisfaction, future intention to co-produce and attitude towards co-creation of value

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Satisfaction	✓	0.879
Future intention to co-produce	✓	0.746
Attitude towards creating value in-use with co-production partner	✓	0.788
Attitude towards dialog to increase value-in-use	✓	0.724

The analysis for discriminant validity showed that all four factors were also discriminant from each other as presented in Table 4.32. The factor correlation matrix shows that the highest variance shared by any two factors were slightly less than 40 percent (39.94 percent), which is still well below the 50 percent cutoff level.

Table 4.32: Discriminant validity through factor correlation matrix for satisfaction, future intention to co-produce and attitude towards co-creation of value

Factor correlations				
Satisfaction	1.000			
Future intention to co-produce	0.386	1.000		
Attitude towards creasing value in-use with co-production partner	0.632	0.227	1.000	
Attitude towards dialog to increase value-in-use	0.228	0.500	0.126	1.000

As a result of the EFA run on pilot data, 13 items were deleted due to low factor loadings, low communalities, cross loadings and reliability concerns. The survey instrument for the main study was generated according to the results of the pilot data analysis discussed in this section. Table 4.33 presents the results of the EFA for the pilot

study. The main survey instrument finalized as the result of the pilot study is presented in Appendix E.1.

Table 4.33: Results of the exploratory factor analysis on the pilot data

Factor name	Number of items remaining after EFA	Average factor loading	Cronbach Alpha	Number of items deleted
Expertise capacity	6	0.857	0.941	-
Resource capacity	4	0.822	0.796	-
Risk taking capacity	3	0.857	0.819	-
Need for interaction	4	0.802	0.821	-
Optimism	3	0.752	0.816	-
Innovativeness	5	0.786	0.877	-
Discomfort	4	0.727	0.780	-
Skepticism	4	0.713	0.730	-
Compatibility and relative advantage	6	0.821	0.917	-
Trialability	3	0.805	0.751	-
Observability	3	0.688	0.832	-
Complexity	3	0.880	0.881	-
Communication quality	5	0.814	0.950	-
Service quality	20	0.723	0.944	2
Access convenience	4	0.793	0.842	2
Perceived crowdedness	3	0.854	0.919	-
Perceived waiting time	3	0.719	0.824	-
Role clarity	4	0.851	0.875	2
Enjoyment	3	0.864	0.889	-
Motivation	8	0.817	0.878	4
Attitude	4	0.682	0.898	-
Intention	3	0.881	0.945	-
Functional value	3	0.816	0.856	-
Social value	5	0.845	0.951	-
Emotional value	3	0.795	0.929	1
Epistemic value	3	0.751	0.905	-
Convenience value	3	0.892	0.920	1
Satisfaction	3	0.879	0.909	1
Future intention to co-produce	5	0.746	0.836	-
Attitude towards co-creation of value	15	0.762	0.963	-

4.4 MAIN SURVEY

The section will delineate the method used for the main survey and the calculation of the sample size. It will explain the reasons why online data collection method was deemed appropriate for the main study. It will also detail the data collection phase of the main study. Then, calculation and justification of the sample size will be presented.

4.4.1 Method for the Main Survey

As briefly introduced in section 4.3.3.3, the data collection method for the main survey as well as the pilot study was web-based online data collection, which is the increasing trend due to its advantages, given that the context of the study is appropriate with the method (Weber et al. 2005). This represents an important divergence from customary paper-and-pencil method.

There are two main reasons for such change of scenery in marketing research. In 1998, Weible and Wallace (1998, p. 22) had argued that through online survey, researchers were able to reach “technologically sophisticated population”. Therefore, data collected through online methods were argued to include a degree of bias, thus jeopardizing its power of generalizability. Yet, Internet use worldwide has shown a tremendous increase within the past decade. According to World Bank, the world wide usage of Internet has increased over 400 percent between years 2001 through 2011². According to the same report the increasing trend for Turkey, the country where the survey was conducted, has been reported to be over 800 percent for the same time period. In 2011, Turkey has ranked third in the world in year-to-year growth in penetration of Internet usage, following Philippines and India, reaching population penetration over 49 percent. This suggests, as Granello and Wheaton (2004, p. 389) indicate, the demographics of Internet users in the world are “becoming more and more inclusive”.

The second reason for increasing trend of online data collection methods is the increasing number of studies that point to clear advantages of this method, as opposed to traditional techniques of mail survey, field survey, and/or telephone survey.

²The World Bank Report, 2012, <http://search.worldbank.org/all?qterm=internet%20usage> [accessed 30 December 2013].

In his 2002 study, Jarvis has argued that reasons such as rising costs or the threat the respondents felt regarding the misuse of information they provided were the major reasons for divergence from traditional methods. Furthermore, loss of data on its way from the field to the researcher (Weber and Roberts 2000) as well as the potential of error while collecting and entering data (Reynolds-Haertle and McBride 1992) caused traditional data collection methods to suffer from further dissemination.

On the other hand, several advantages of online data collection method have attracted marketing researchers' attention. Reduced response times (Francheschini 2000, Bauman et al. 1998), lowered costs (Schleyer and Forrest 2000), increased ease of data entry (Granello and Wheaton 2004), simplified data transfer (Ilieva et al. 2002), and flexibility of the survey format (Dillman 2000) are the major advantages of online data collection methods. Furthermore, Bosnjak and Tuten (2001) argue that through online methods, the researcher has the opportunity to gather information about the respondents answering process, through which the researcher can track the days, times, durations, and percentage of completion over observation. Another crucial point that works in the advantage of online methods compared to traditional paper and pencil method is respondents' free will to answer the questions of the survey. Lefever et al. (2007) argue that in traditional methods, there is no way to guarantee if the respondents are truly willing to participate in the survey or simply participating due to external pressures such as the ones imposed by the fieldworkers. On the contrary, through online methods, participants act through their own free-will to take part. Moreover, they have the opportunity to take the survey at their own convenience and pace (Lefever et al. 2007).

Online data collection is an umbrella term of collection of data using technology. Although there are several different methods of data collection online, the two most commonly used techniques are e-mail and web-based surveys (Granello and Wheaton 2004). The main difference between the two methods is that while in the former, the survey is embedded in an e-mail that is sent to prospect respondents which they simply reply to answer, in the latter, the respondents are directed to a third page that contains the survey questionnaire (Granello and Wheaton 2004).

This study utilized web-based online data collection technique. As the passengers used the online check-in web-page to complete their online check-in, they were solicited to

participate in the survey. The respondent who agreed to take the survey was directed to survey questionnaire.

Lefever et al. (2007) suggested that the style of the first page of the online data collection instrument had a direct impact on response rate. Following Lefever et al.'s (2007) suggestion, the first page of the survey instrument had information regarding; parties conducting the survey, the aim of the survey, the approximate amount of time in minutes to complete the survey as well as privacy assurance. The questions were distributed among 22 screens. At the bottom of the each page, the respondents were provided with a bar that indicated their progress. The 13th screen informed the respondents that they were over the half way mark and were kindly asked to continue with the questions. The demographic information was the last screen of questions and the survey completed with acknowledgement of receipt and a "thank you" message as suggested by Klein (2002).

Just as the pilot study was designed, the main survey used fonts that were simple and large (Hanscom et al. 2002). The background color was pale for easy reading (Klein 2002). The respondents were provided with a single screen at time, which they could freely move back and forth using clearly designed "back" and "next" buttons at the bottom of each screen (Hanscom et al. 2002, Manfreda et al. 2002). The buttons were placed at the bottom of the each screen, which the participants could reach with only a single scroll down (Hanscom et al. 2002).

Following Granello and Wheaton's (2004) suggestions, "error detection" variables were included in the survey in order to ensure the prevention of multiple submissions of the same respondents, which is usually the case when the respondents have slower Internet connections and resubmit the form several times. Error detection was conducted through the comparison of IP addresses of completed surveys that were submitted very close to each other as suggested by Granello and Wheaton (2004).

Necessary precautions were taken to ensure that the survey was available in the same format in every web browser. Furthermore, as suggested by Granello and Wheaton (2004, p. 392) the data was downloaded daily to minimize the possibility of technical problems and to "have a back-up".

4.4.2 Sample Size

The sample size for the main study has been computed using guidelines provided by Malhotra (2010).

$$ss = \frac{Z^2 * (\pi) * (1 - \pi)}{c^2} \quad (4.1)$$

where;

Z = Z value for the determined confidence level

p = level of precision

c = confidence interval

Following sample size formulation, 1.96 as the z score for 95 percent confidence level has been used. In order to represent the widest possible variation, π has been set to 0.5. According to Malhotra (2010, p. 412) “the product of $\pi (1 - \pi)$ is the greatest, which happens when π is set at 0.5”. Finally, although 0.05 has been accepted to be standard practice in sample size calculations for social sciences (Malhotra 2010) in order ensure more rigorous approach the confidence approach has been reduced to 0.03.

$$ss = \frac{1.96^2 * (0.5) * (1 - 0.5)}{0.03^2} \quad (4.2)$$

Following this formula, the computed sample size was 1067. The sample of 1067 also exceeds Hair et al.’s (2010, p. 741) recommendation for required sample size for structural equation modelling as they argue “when the number of factors is larger than six, some of which use fewer than three measured items as indicators, and low communalities are present, sample size requirements may exceed 500”.

4.4.3 Data Analysis and Statistical Packages

Data analysis of the study was initiated with exploratory stage, in which quantitative and qualitative data was thoroughly studied, analyzed, and used to generate the research model and its indicators.

In the next stage, Churchill's (1979) paradigm for developing measures was used to develop scales that were generated by the researcher. For adopted, adapted, and generated scale items, exploratory factor analysis and reliability analysis were run before moving on to the final stage of model testing. During this stage, face validity was used to ensure the indicators of the constructs covered the intended meanings (Robinson et al. 1991, Churchill 1979). Exploratory factor analysis (EFA) for the pilot study was conducted in order to group variables into subsets and purify the measures (Tabachnick and Fidell 2007). Reliability analysis was carried out to determine the level of random error for each of the purified measure using Cronbach's alpha (Peter 1979, Cronbach 1951). Next, measurement model was estimated using confirmatory factor analysis to ensure valid measures were being used in order to test the structural model.

In the final stage of analysis, structural equation modelling was used to understand the causal relationships between well defined, refined and modified constructs of the study as suggested by Hair et al. (2010).

All non-parametric and parametric tests were conducted using Statistical Package for Social Sciences (SPSS) software, version 16. Multivariate analysis including confirmatory factor analysis and structural model testing was conducted through Analysis of MOment Structures (AMOS), version 16.

The subsequent sections will delineate detailed aim and method of analysis briefly introduced in this section.

4.4.4 Exploratory Factor Analysis and Reliability Assessment

EFA is a widely used statistical technique, especially in social sciences (Costello and Osborne 2005). The aim of EFA is to search, define, and summarize the original data into smaller and more composite subsets, alternatively named as factors (Gorsuch

1983). The result of EFA is grouping of variables in subsets that are highly correlated with each other, and at the same time, distinct from different subsets of variables (Tabachnick and Fidell 2007). EFA is generally used at the initial stages of data analysis, with the assumption of the researcher that there is a pattern in variables that will form a meaningful structure between them. Although this may imply that the researcher does not have a priori knowledge of such structure for sufficient assessment and the factor analysis will “figure it out” (Hair et al. 2006, p. 110), this is rarely the case. As a matter of fact, Floyd and Widaman (1995) argue that only in rare cases, the researcher starts analysis without a priori knowledge or assumptions how the variables are related. Hair et al. (2006) conclude the conceptual underpinnings will have great impact on factor analysis. Therefore, factor analysis is a reduction and summarization technique that operates under conceptual tenets (Hair et al. 2006). Put differently, correlations among variables are considered to be the sine qua non condition in order to conclude in any factor structure, even in cases in which the factor structure meets the strictest statistical requirements, yet “it is the responsibility of the researcher to ensure that the observed patterns are conceptually valid” (Hair et al. 2006, p. 113).

There are different decisions to be made by the researcher regarding the way to perform an EFA. The next section will briefly introduce decisions made by the researcher relevant to this study.

In essence, factor analysis is about determining the underlying structures. Consequently, the next question the researcher faces is: among which data am I striving to reveal the underlying in structures? When the aim is to uncover the structures between respondents, the researcher seeks to detect correlations between individuals. Q factor analysis stands for such investigation in which the goal is to “condense large numbers of people into distinctly different groups within a larger population” (Hair et al. 2006 p. 107).

Alternatively, when the aim of the researcher is to define latent dimensions among variables, R factor analysis is performed. The aim of R factor analysis is to study the correlations among variables, as opposed to respondents, in order to reach meaningful subsets to be further analyzed through other means of multivariate techniques. As the

aim of the EFA performed through this study is to summarize and identify structures related to variables rather than individual respondents, R factor analysis is performed.

As introduced previously, factors reveal themselves through the correlations among variables. In order for such correlations to form, variables and size of sample must meet several criteria. First, factor analysis is performed mostly on metric variables, with the exception of nonmetric variables which are converted to dummy variables. Furthermore, there are relatively strict rules that apply in terms of sample size to perform EFA. All of the variables analyzed in this study through EFA were metric. In line with suggestions of Hair et al. (2006), the sample size for EFA had more observations than variables, exceeding minimum suggested number of fifty observations in total and ten observations per variable.

The correlations mentioned throughout this section reveal themselves through a data matrix, which the researcher then examines to interpret if they are significant, in fact significant enough to form a factor. This study uses all three distinct measures to make the assessment of appropriateness of factor analysis. First, it takes into consideration the Bartlett test of sphericity which is basically a hypothesis testing for the presence of correlations among variables (Bartlett 1954). Naturally, significance level below 0.05 (determined by the p value <0.05) is desired to conclude a presence of correlations among variables. The significance level of Bartlett test of sphericity has been calculated for each of the factor structure in this study and found to be significant ($p <0.05$) on each instance.

Since Bartlett test of sphericity is argued to be sensitive to sample size, causing the test results to be significant even when the correlations are very low (Tabachnick and Fidell 2007), second and third measures of intercorrelation, Kaiser-Meyer Olkin Measure of Sampling Adequacy (MSA) test have been applied. MSA is a correlation measure for both the entire correlation matrix and every individual variable within the matrix to evaluate magnitude of relationships (Hair et al. 2006). Put differently, MSA is a calculation of the ratio between sum of squared correlations to the sum of squared, plus, the sum of squared partial correlations (Tabachnick and Fidell 2007). MSA levels 0.80 and above are described as “meritorious” by Hair et al. (2006, p. 114), where 0.70 or above is called “middling”. As discussed in the previous section the MSA scores of the

EFA for the pilot study reported them to vary between 0.955 through 0.797, which are well above acceptable levels, even considered meritorious. The third assessment is the measure of adequacy where each individual variable's measure of sampling adequacy represented by the diagonal figures in the Anti-image correlations matrix table. Also referred to as partial correlations, acceptable level of anti-image correlations is above 0.70 for each variable, which was met by this study's EFA results.

Once the proof of adequate correlation is established, the next task to perform is deriving factors and assessing the overall fit, which makes up the fourth stage of Hair et al.'s (2006) paradigm for EFA.

Perhaps one of the biggest controversies surrounding EFA is specifying the method of extracting factors and deciding on number of factors to be extracted. In order to make decisions regarding the method of extraction, the researcher needs to regard two issues. First is the researcher's aim with the factor analysis and second is the level of a priori knowledge that the researcher has on the topic of the research. The two issues are tightly wrapped around the discussion of principal component analysis versus common factor analysis (Costello and Osborne 2005).

Principal component analysis is useful when the researcher has elevated prior knowledge on the research topic and the aim to deduce the number of factors to minimum factors. Principal component analysis uses all the variance in observed variables, differentiating itself from common factor analysis, in which only the common variance is taken into consideration (Tabachnick and Fidell 2007).

This study uses principal component analysis as the primary aim of the exploratory factor analysis is to reduce the "number of factors that account for the maximum portion of the total variance represented in the original set of variables" (Hair et al. 2006, p. 118).

Once the decision has been made on the extraction method, the next step is to consider the criteria for the number of methods to be extracted. There are several criteria when deciding on the final number of factors to be extracted. The four criteria that were used to make the final decision on number of factors to be extracted are explained below.

First one is the latent root criterion. The heart of the latent root criterion is that each factor that will be retained need to account for at least one variable, meaning each variable will contribute a value of 1 to the latent roots, alternatively, labeled as eigenvalues, and the eigenvalues < 1 are disregarded. The second is the a priori criterion in which the researcher imposes the number of factors to be extracted. This method was especially valid for multi-dimensional scales with established reliability levels. The third criterion is the percentage of variance criterion, in which cumulative percentage of the total variance is regarded to determine cut-off points. Following Hair et al. (2006), a solution that counts for 60 percent of the variance has been sought in this study. Finally, the scree test criterion has been applied to plot the eigenvalues of the factors to visually assess optimum number of factors and cut-off points that “make sense” in conjunction with latent root criterion.

The next step of EFA was the interpretation of the factors through factor matrices. Orthogonal factor rotation with VARIMAX was used as the aim was to reduce the number of factors, and it is argued to produce the simplest factor solution (Hair et al. 2006). Therefore, the decision criteria for producing factor solutions were based on rotated solutions with loadings and communalities above 0.50 threshold level that loaded on a single factor. Once the final solution was achieved, the factors were labeled according to the names given through operational definitions.

The next step to conclude the factor structure is to assess the reliability of each distinct dimension (Malhotra 2010).

Founded on the early works of Spearman (1910, 1904), reliability is an assessment lies on the premise that every measurement has a degree of error, which in conjunction with the true variance make up the observed variance of a measure, respectively the variance of a multi-item scale (Peter 1979). Put arithmetically when the scale score is:

$$X_{\text{observed}} = X_{\text{true}} + X_{\text{error}} \quad (4.3)$$

and the variance of its components are measured by:

$$V_{\text{observed}} = V_{\text{true}} + V_{\text{error}} \quad (4.4)$$

the error variance represents all of the random and systematic error that causes the gap between the true and observed variance (Peter 1979). As the gap widens between the observed and the true values, it insinuates higher variance of error, jeopardizing the reliability of the measure. Thus, reliability is defined as “assessment of the degree of consistency between multiple measurements of a variable” (Hair et al. 2006); since it is theoretically impossible to stabilize the variance in error, strictly in the sense of random error.

There are three basic ways to assess the reliability of a scale; test-retest method, internal consistency method, and alternative forms method. All three methods lie on the premise that reliability is an assessment of correlations. Yet, the three methods separate in “what the scale will be correlated with” (Peter 1979, p. 8). As this study uses the internal consistency method of reliability assessment, the two other forms of assessment will not be further discussed.

Internal consistency reliability is an assessment of reliability that basically lies on three premises. First is the correlation of the item to the total summated scale score, namely item-to-total correlation; second is the correlation between items, namely inter-item correlations; and, finally third is the assessment of mean reliability coefficient between different halves of the multi-item measure, either randomly split by the researcher or through the Cronbach’s (1951) alpha method.

This study uses all three methods of reliability assessment. Following the guidelines provided by Hair et al. (2006), it regards threshold levels of 0.50 for item-to-total, 0.30 for inter-item and 0.70 for Cronbach’s alpha assessment.

The opening sentence in Peter’s (1979, p. 6) influential and widely cited article is “Valid measurement is the sine qua non of science”. This view suggests, assessment of reliability, although essential, is not sufficient to conclude the measures used in this study are valid (Peter 1979). The next section detailing Confirmatory Factor Analysis (CFA) process will detail the process that has been applied to assess the validity of the scales used in this study. Yet, it is worth mentioning that although assessment of validity has been largely associated with CFA, there are indicators of convergent and discriminant validity in EFA stage. Therefore, the remaining part of this section will

briefly introduce the two types of validity that was assessed during EFA of the main study.

In the broadest sense, scale validity is the assessment of the extent which the measures in fact, represent to concept that they are supposed to be representing (Hair et al. 2006). During EFA, it is assessed through convergent and discriminant validity.

Convergent validity, assessed by the correlation levels of the two measures of the same concept, is accepted to be a strong indicator of systematic variance (Peter and Churchill 1986). One of the ways to assess convergent validity in the preliminary stages of the research is to evaluate the factor scores of each item to make sure that they load highly (>0.50) on the scale they represent (Tellegen et al. 1988). Thus, individual measures converge on the same factor to generate the overall dimension.

Discriminant validity defined as the distinctness of similar concepts is assessed by the factor correlation matrix achieved during EFA. The two important indicators of discriminant validity is the absence of cross loadings between factors and correlation levels between factors that are less than 0.70 (Gaskin 2012). Through demonstration of factor correlations less than 0.70, the researcher is able to conclude that the shared variance of the factors (squared correlations between factors) in the proposed final solution is not greater than 50 percent. The importance of assessing the factor loadings to determine discriminant validity has been established in literature. Farrell (2010, p. 326) assert “EFA is useful for learning if discriminant validity issues are a result of poorly performing items. If items cross load on more than one latent variable, removal of offending items should improve discriminant validity”. Farrell (2010) identifies lack of cross loadings during EFA as a beneficial method to demonstrate discriminant validity before moving on the CFA, consequently Fornell and Larcker’s (1981) average variance extracted versus shared variance test can be further employed.

This section briefly summarized the rationale and application of EFA of the main study. Yet, same set of rules had been applied to the pilot study of the research, as briefly discussed in the section 4.3.3.6, labeled quantitative assessment of the pilot study. The EFA results for the pilot study had been presented through Tables 4.3 and 4.32, which show that the results fulfill the necessary conditions of factor solutions, reliability and

validity assessments discussed above. The EFA results of the main study are presented under section 5, labeled analysis and findings.

4.4.5 Confirmatory Factor Analysis and Model Estimation

Churchill (1979, p. 69) argues that “though this explication [referring to exploratory factor analysis] may be satisfactory during the early stages of research on a construct, the use of factor analysis in a confirmatory fashion would seem better at later stages”. There are very distinct reasons for the supported usage of confirmatory factor analysis (CFA) in the later stages of the analysis.

First, CFA is much stricter assessment, as opposed to EFA, since the analysis is forced by the researcher to demonstrate the indicators of a specific construct, actually, capture the essence of the construct as implied by the theory (Bagozzi et al. 1991). What this suggests is that EFA is an analysis of statistical results that can be carried out without any a priori knowledge on researcher’s part (Hair et al. 2006). The researcher may accept the factor structure that the data produces through EFA, name the factors in line with the items that make up the factor, and move on with further analysis, if desired. On the other hand, although CFA is related to factor structure in the broadest sense, it differentiates from EFA philosophically (Hair et al. 2006). In CFA, the researcher operates with prior theoretical knowledge that guides him/her to determine the exact nature and number of latent constructs and their indicators. Stated alternatively, even before conducting CFA, the researcher is obliged to know which indicators will load highly under which factors. What this suggests is that satisfactory CFA results have more precise assessments to offer in terms of construct validation (Gerbing and Anderson 1988).

Second, as CFA demonstrates a causal linkage between the latent construct and its indicators (Anderson and Gerbing 1982), it caters to subsequent stages of the testing for the structural model (Anderson and Gerbing 1988). Put simply, the testing of structural model through structural equation modeling (SEM) is not actual test of the theory but the test of how well the data set fits with the researcher imposed model. Hair et al. (2006, p. 774) summarizes it as “CFA is a tool that enables us to either confirm or reject our preconceived theory”.

Before advancing to SEM and assessment of model fit which are delineated in the next section, CFA's relation to construct validation deserves further attention.

Peter (1981, p. 134) define construct as “a term specifically designed for a special scientific purpose, generally to organize knowledge and direct research in an attempt to describe or explain some aspect of nature”. Respectively, construct validity is defined as the “vertical correspondence” (Peter 1981, p. 134) of the abstract, unobserved [latent] construct and its indicators which are proposed by the researcher on an operational level. If such thing were to exist, through perfect construct validation, the researcher would explain the total characteristics of the latent construct through its purported indicators. Since no set of indicators can ever capture the essence of a construct to its full extent, construct validation lies on the confidence and knowledge of the researcher (Peter 1986). In other words, construct validity becomes the assessment of the level or the degree of representation of the latent variable through various means of convergent validity, discriminant validity, nomological validity, and construct reliability rather than absolute amount of explanation.

As explained in the previous section, convergent validity is the measure that ensures the agreement between the latent variable and its indicators (Peter and Churchill 1991, Anderson and Gerbing 1988). In order to ensure the convergent validity of the latent variables in CFA, this study uses three different assessments. The first assessment of convergent validity is each individual indicator's own reliability, which is evaluated through squared multiple correlations (SMC) represented by (ρ) which assert the level of linear relationship between the indicator and the latent variable that it is a part of (Bagozzi et al. 1991). The accepted threshold level for SMC is accepted to be 0.50, as SMC is calculated by

$$\rho_j^2 = \lambda_j^2 / [\lambda_j^2 + \text{Var}(\epsilon_j)] \quad (4.5)$$

where;

ρ_j^2 : squared multiple correlations of the j^{th} indicator

λ : indicator loading

Var (ϵ_j): error variance of the j^{th} indicator

Fornell and Larcker (1981) assert that an indicator's own reliability in the form of SMC is not a sufficient evidence of the overall reliability of a construct. Likewise, Hair et al. (2006) argue that composite reliability (CR) of the latent variable needs to be evaluated to conclude convergent validity. Therefore, CR that is represented by ρ_c is the second indicator for convergent validity, and the cutoff point of CR is accepted to be 0.70.

The calculation of ρ_c lies on the ratio between sum of the squared item loadings and error variance of the indicators. Thus, CR is calculated through

$$\rho_c = \frac{\sum \lambda^2}{[\sum \lambda^2 + \sum (\Theta)]} \quad (4.6)$$

where

ρ_c : composite reliability

$\sum \lambda^2$: sum of squared indicator loadings

$\sum (\Theta)$: sum of error variance of the indicators

Finally, Fornell and Larcker (1981) argue that a third indicator should be taken into account to conclude the convergent validity of a latent variable, in conjunction with ρ_j^2 and ρ_c , which is the average variance explained represented by ρ_v .

Average variance extracted (AVE) is an essential parameter to conclude convergent validity since in a case where the indicator of a latent construct fail to explain greater portion of its master latent variable, one must conclude that the majority of the explanation must be done by the error term (Fornell and Larcker 1981). As a result, 0.50 is the accepted level of AVE, which indicates the indicator of the latent variable explain at least 50 percent of the variance of its master. AVE is calculated through

$$\rho_v = \sum (\lambda^2) / [(\sum \lambda^2) + \sum (\Theta)] \quad (4.7)$$

where

ρ_v : average variance extracted

(λ^2) : squared loadings of the indicators

Θ : error variance of the indicators

Validity is not only a measure that may be concluded by the presentation of a sufficient relationship between a construct and its indicators but needs to be supported by the distinction between one latent construct's indicators to another latent variable. In other words, as convergent validity may be argued to be a proof of an indicator belonging to a latent variable as theorized, it needs to be supported by discriminant validity, which ensures indicators of a construct is distinct from the items of other latent variables' indicators (Peter and Churchill 1986).

According to Hair et al. (2006), there are two basic ways to assess discriminant validity. The first one the less rigorous approach of chi-square difference test between constrained and unconstrained models. Yet, they argue that "this test does not always provide strong evidence of discriminant validity, because high correlations, sometimes as high as 0.9 can still produce significant differences in fit" (Hair et al. 2006, p. 778).

The more rigorous approach, which is used in this research, assesses discriminant validity through comparing average variance extracted between the constructs to squared multiple correlations of the said two constructs (Fornell and Larcker 1981). As the average variance extracted is expected to be greater than squared multiple correlations, it is concluded that the latent construct "explains its item measures better than it explains another construct" (Hair et al. 2006, p. 778). The greater AVE compared to squared multiple correlations is accepted to the best indicator of discriminant validity (Hair et al. 2006).

Finally, the last evaluation to conclude validity comes in the form of nomological validity. Nomological validity is an assessment that is concerned with the constructs of

a measurement theory (Hair et al. 2006) and it is an evaluation of overall fit of a model (Peter and Churchill 1986) which is assessed by goodness-of-fit (GOF) indices that will be evaluated in the next section.

4.4.6 Structural Equation Modeling and Assessment of Model Fit

Byrne (2010) defines structural equation modelling (SEM) as a statistical methodology, which utilizes a confirmatory approach for testing of a theory. There are several important points to be discussed regarding this definition before advancing to delineate the specifics of the approach.

First, SEM is used for testing of a theory, suggesting there needs to be a theoretical foundation behind the research model. Although it may be argued that an existence of a theory is important to many other statistical procedures, it is crucial for SEM, as it utilizes a confirmatory rather than exploratory approach. This point inherently suggests, SEM is for theory testing and confirming rather than building (Hair et al. 2006). At this point, it is important to point out that SEM may be utilized for exploratory purposes to a certain and a limited extent (Jöreskog 1993), which will be discussed in later sections.

SEM taking a confirmatory approach requires researcher to form all necessary relations before starting analysis rather than forming a basic model and leaving the estimation issues to a statistical program, hoping it will “fill in” the gaps of the model (Hair et al. 2006, p. 720). Aforementioned relations between constructs point in the direction of theoretically sound causal relationships and, consequently, a structured research model.

Causality is described as hypothesized cause and effect relationships, where the sequence of variables define how the hypothesized cause (independent variable) determine the effect (dependent variable) (Tabachnick and Fidell 2007). Therefore, SEM regards the causal links to be represented by series of structural (regression) equations, which are, then, estimated simultaneously (Byrne 2010, Hair et al. 2006). As the sources of the causality is forced on the statistical procedure by the researcher, relying on a specific theory, SEM is used to understand the extent to which the entire system posed is consistent with data, using goodness-of-fit (GOF) indices. In other words, the most important task at hand is to determine the GOF between the theory

driven research model and the sample data to test how good the data fits to the hypothesized model (Byrne 2010, p. 7). As it is impossible for the observed data to fit perfectly with the research model hypothesized, there is always expected residual between the two which is called the discrepancy of the two. Therefore, Byrne (2010, p. 7) summarizes the model-fitting process by:

$$\text{Data} = \text{Model} + \text{Residual} \quad (4.8)$$

Where data is the scores of the observed variables, model is the hypothesized model linking latent variables to one another, and residual is the gap between hypothesized model and the observed data.

Up to this point, SEM has been explained through its reliance on theory taking a strictly confirmatory approach to understand the extent to which the observed data fits the theorized model using GOF indices. However, in practice, there are three different approaches used as strategic framework for testing structural equation models (Jöreskog 1993).

The first approach is the strictly confirmatory approach (SCA). In SCA, the researcher forms theory driven research model, collects data, tests the GOF of the data to the research model, and accepts or rejects the model according to the results. As there are considerably few cases in real life where the data fits perfectly with the predetermined research model, SCA is the least common among of the three approaches.

The second approach is the alternative models approach (AMA). In AMA, the researcher forms several competing models that are all theory driven. Once the data has been collected, the GOF indices are used to determine which of the competing models best represents the sample data.

Finally, the third approach is model generating approach (MGA). In MGA, the researcher starts with a single theory driven model and uses GOF indices to determine the level of fitness. If the analysis results in poor fit, the modification indices are used to modify and to reestimate the model until theoretically meaningful and statistically well-fitting model has been reached (Byrne 2010).

This study utilizes MGA where it starts with single research model that is grounded in the theory, collects sample data, uses GOF indices to determine the fitness of the model, and modifies the model in light of modification indices to determine the best fitting model that is still true to theory it stems from.

This research utilizes MGA and makes use of modification indices to generate a better fitting model within the scope of the original theory. As the theory that the research model relies on and the data collection methods have been discussed previously, the next section will concentrate on the examination of multivariate assumptions that the researcher needs to address prior to assessing fitness of the data. Then, it will concentrate on GOF indices that will be used to determine the fitness of the measurement models and the research model to the sample data.

4.4.6.1 Testing of the multivariate assumptions

The need to test for certain assumptions are greater in multivariate analysis, since the complexity of such models, in terms of number of variables used, jeopardizes the results due to higher potential distortions (Hair et al. 2006). Although there are different assumptions that may affect the robustness of the model testing, the commonly practiced assumptions of linearity and multicollinearity will be discussed further.

Linearity is an essential step before moving on to the structural model testing because, like many other multivariate techniques, SEM is based on correlational measures. Since “correlations represent only the linear associations between variables”, any effects that are a produce of a non-linear relationship would not be presented in final correlations matrices (Hair et al. 2006, p. 85). Although there are various ways to detect linearity such as examination of the scatter plot in order to detect nonlinear patterns or examining the residuals through simple regression analysis (Gaskin 2012), curve fitting model (curve estimation) has been used in this study to assess the assumption of linearity.

Test of linearity through curve estimation is the test for all possible relationships that two variables may have including linear, logarithmic, inverse, quadratic, cubic, compound, logistic, growth and exponential. The result of the curve estimation test produces the parameter estimates in terms of F value, and its statistical significance for

each relationship is studied. The relationship is concluded to be linear only if the F value for the linear relationship is greater than all other relationships being investigated and the linear relationship is statistically significant. The relationship is said to be sufficiently linear if the linear relationship is statistically significant, yet any other relationship has a greater F value than the linear relationship (Gaskin 2012). The stronger F value for any relationship other than linear does not automatically suggest a strictly non-linear relationship but indicates the existence of another relationship that is stronger than the linear relationship (Gaskin 2012).

The second test for multivariate assumptions was applied for multicollinearity. Multicollinearity is carried out for when there are more than one variable predicting another variable (Gaskin 2012). This suggests multicollinearity tests are carried out only when there are two or more variables on the same level. The reason for applying such diagnostic to only same level variables is that multicollinearity is concerned with the size and the nature of the relationship between different independent variables predicting the same dependent variable. This suggests the results of the correlations between the predicting variables need to be below the suggested threshold levels to ensure that such variables are in fact, not collinear (Tabachnick and Fidell 2007). Multicollinearity is assessed through tolerance and variance inflation factor (VIF), where the accepted levels are 0.90 for the former and 10 for the latter (Hair et al. 2006).

In social sciences an effect is usually a produce of various causes. In other words, there are very few cases that the structural model consists of a single predictor explaining a cause. In practice, many of the structural models consist different predictors, various causal inferences and many dependent variables. In such cases, the threat of multicollinearity is raised, since the existence of different constructs predicting a single dependent variable may potentially mean the size and the nature of the relationship may be effected by other variables (Hair et al. 2006).

Therefore, assessment of multicollinearity is basically studying the correlations between same level independent variables to ensure that the variables are not highly correlated (Tabachnick and Fidell 2007). Two most common way to diagnose multicollinearity are through assessment of tolerance and variance inflation factor (VIF) (Tabachnick and Fidell 2007). According to Tabachnick and Fidell (2007), the minimum accepted level

of tolerance is 0.90 and maximum accepted level of VIF is 10 (Hair et al. 2006). As VIF is defined as the reciprocal of tolerance, accepting minimum tolerance level of 0.90 automatically suggests maximum VIF to be 10 since, VIF is computed through;

$$\text{VIF} = 1 / \text{Tolerance} \quad (4.9)$$

Where

$$\text{Tolerance} = (1 - R^2) \quad (4.10)$$

As the minimum accepted level of tolerance is 0.10, the maximum accepted level of VIF is reached through;

$$\text{VIF} = 1 / 0.10 = 10 \quad (4.11)$$

4.4.6.2 Goodness-of-fit measures

Goodness-of-fit (GOF) measures are measures that rely on the covariance matrix of the indicator items. In other words, once data and the research model is specified, “model fit compares the theory to the reality as represented by the data” (Hair et al. 2006, p. 745) using covariances. In a perfectly fitted model, the researcher would expect estimated covariance matrix (Σ_k) and the observed covariance matrix (S) to be exactly the same. Yet, as in real life, there can be no absolute fit, and the GOF indices are used to measure the proximity of the two matrices. As the gap between Σ_k and S closes, the model is said to have a better fit (Hair et al. 2006)

The next section will concentrate on different GOF measures that will be used to evaluate the GOF of the model in this study. Four of the absolute fit indices, chi-square GOF, goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI) and root mean square error of approximation (RMSEA) will be briefly described. The section will conclude with further evaluation of three of the incremental fit indices normed fit index (NFI), comparative fit index (CFI) and Tucker Lewis index (TLI).

4.4.6.2.1 Absolute fit indices

The basic definition of SEM usually refers to the statistic measure by absolute fit indices. In other words, absolute fit indices are the measure of the extent that the theory matches the data collected (Kenny and McCoach 2003).

Chi-square GOF (χ^2)

As argued previously, the difference between the covariances matrices of Σ_k and S is the foundation of GOF, and χ^2 is the test of differences. In other words, χ^2 is the hypothesis testing to determine whether there is a difference between model hypothesized and model produced by sample data. χ^2 is determined through

$$\chi^2 = (N - 1) (S - \Sigma_k) \quad (4.12)$$

where

N is the sample size, and $(S - \Sigma_k)$ is the difference between observed and SEM estimated covariance matrix as argued above (Hair et al. 2010). Yet, there is a crucial point regarding χ^2 that also explains why there are so many different GOF indices used in SEM. χ^2 GOF index is extremely dependent on the sample size. A careful eye notices even if the difference between the covariance matrices were to remain constant, as the sample size increased, χ^2 would also increase accordingly. Therefore, χ^2 is not only dependent on the difference between covariance matrices but also on the sample size.

The χ^2 measure alone does not mean much to the researcher unless the researcher attempts to interpret whether the χ^2 is statistically significant. Traditional p -value is used to determine whether χ^2 is statistically significant. Yet, unlike traditional interpretations, in order to conclude that the two covariances are equal to one other, the researcher seeks a small χ^2 value with a large (not statistically significant) p -value. However, as the sample size increases, χ^2 value increases with it accordingly, resulting in p -value less than 0.05. Therefore, although all GOF indices may predict good fit, the researcher may never achieve a non-significant χ^2 , purely due to large sample size. Therefore, the CMIN/df is studied to assess the fit of the model.

CMIN/df

In order to overcome the problems of χ^2 dependency on sample size, the measure of CMIN/df is advised. CMIN (χ^2) divided by degrees of freedom (df) is argued to be less affected from sample size as it represents a ratio rather than the absolute value of χ^2 . Although CMIN/df between the values of 1 and 3 are usually desired (Carmines and McIver 1981), any value between 1 and 5 is usually accepted (Marsh and Hocevar 1985).

MacCallum et al. (1996) argue that large samples are crucial for calculation of parameter estimates, inherently covariance structures. Consequently, examination of χ^2 alone, or even with CMIN/df to conclude of model fit, is “unrealistic for SEM empirical research” (Byrne 2010, p. 76). In order to overcome problems related to χ^2 , other GOF measures such as GFI, AGFI, and RMSEA are taken into account.

Goodness-of-fit Index (GFI)

One of the first model fit statistic that attempted to free the estimates from the effects of sample size is GFI. While the formula for GFI does not include sample size (N), it has been criticized for still being affected by sample size since sample size inherently affects sampling distribution (Maiti and Mukherjee 1991). The possible range of GFI is between 0 and 1. Since GFI is calculated through

$$\text{GFI} = 1 - (F_k / F_0) \quad (4.13)$$

where

F_k is the minimum fit function of a SEM model using k degrees of freedom and F_0 is the fit function of a model that with no theoretical relationships (meaning all parameters are simply zero). Since the main idea behind a theory driven model is that there are relationships that are present between constructs, F_k is expected to differ greatly from F_0 . Put differently, if there was no difference between F_k and F_0 , then we would have to conclude

$$F_k / F_0 = 1 \quad (4.14)$$

and the GFI statistic would be 0, meaning there is no fit.

$$\text{GFI} = 1 - 1 = 0 \quad (4.15)$$

GFI statistic will be closer to 1 as the estimated model differs from a hypothetical model with no relationships. Therefore, although GFI can vary between 0 and 1, an acceptable level of GFI is any value above 0.90 (Hair et al. 2010).

Adjusted Goodness-of-fit Index (AGFI)

AGFI, as GFI, is an absolute fit index that compares the hypothesized research model to a model with null relationships (Byrne 2010). Yet, it differs from GFI because AGFI takes model complexity into account by adjusting degrees of freedom used in the model to total degrees of freedom available. Since total degrees of freedom available increases with the complexity of the model, “AGFI penalizes more complex models and favors those with a minimum number of free paths” (Hair et al. 2006, p. 747). Similar to GFI, AGFI ranges from 0 to 1. Values over 0.90 are accepted a good-fit (Jöreskog and Sörbom 1993).

Root Means Square Error of Approximation (RMSEA)

RMSEA is another absolute fit index that is used to correct the χ^2 index results of complex models with large data samples. Originally proposed by Steiger and Lind (1980), the heart of RMSEA is the question “how well would the model, with unknown but optimally chosen parameter values, fit the population covariance matrix if it were available?” (Browne and Cudeck 1993, pp. 137-138). RMSEA is basically a measure of discrepancy, which is bound to be influenced by degrees of freedom. Therefore, similar to GFI and AGFI, RMSEA favors relatively less complex models. RMSEA values below 0.08 is considered good-fit (Hair et al. 2006).

4.4.6.2.2 Incremental fit indices

Alternatively named as comparative fit indices, incremental fit indices are assessments of comparison between the specified model and a null model in which it is assumed that there are no correlations between constructs. Incremental fit indices are assessed through NFI, CFI and TLI.

Normed Fit Index (NFI)

NFI is defined as the “ratio of difference in χ^2 value of the fitted model and a null model divided by the χ^2 value for the null model” (Hair et al. 2006, p. 657). It is calculated through (Hair et al. 2010)

$$\text{NFI} = (\chi^2_{\text{null}} - \chi^2_{\text{proposed}}) / \chi^2_{\text{null}} \quad (4.16)$$

where

χ^2 : chi-square value

In theory NFI may take a value between 0 and 1, however the lowest acceptable value is considered to be 0.90 (Bentler 1992). Although, Hu and Bentler (1999) later revised the cutoff value to be closer to 0.95, Hair et al. (2006) argue that when there are substantial number of variables to predict and a fairly large data set, NFI value as low as 0.90 may be accepted.

Comparative Fit Index (CFI)

Hu and Bentler (1999) argue CFI to be an improved version of NFI because its nature is insensitive to the complexity of the model (Hair et al. 2006, p. 749). Byrne (2010) on the same note assert that CFI should be the choice of fit index, especially, in research models with larger samples and higher number of constructs to overcome the over estimation problem of NFI. CFI is calculated through (Hair et al. 2006, p. 767)

$$CFI=1-\frac{(\chi_k^2-df_k)}{(\chi_N^2-df_N)} \quad (4.17)$$

where

k : values associated with specified model which is the resulting fit with k degrees of freedom

N : values associated with the null model

While it is only possible for CFI to take a value between 0 and 1, higher values that are closer to 1 represents a better fit. According to Hair et al. (2006) adequate CFI, which is directly affected by model complexity and sample size, is above 0.90 for complex models.

Tucker-Lewis Index (TLI)

Similar to CFI, TLI is also the comparison between the specified research model and a null model where there are no relationships. Yet, as TLI is not a normed index as NFI or CFI, meaning TLI values can drop below 0 or exceed 1. The equation for TLI is provided below to demonstrate how TLI is calculated and not normed.

$$TLI = \frac{\left[\left(\frac{\chi_N^2}{df_N}\right) - \left(\frac{\chi_k^2}{df_k}\right)\right]}{\left[\left(\frac{\chi_N^2}{df_N}\right) - 1\right]} \quad (4.18)$$

where

k : values associated with specified model

N : values associated with the null model

Since the only major difference between CFI and TLI is the fact that TLI is not normed, CFI and TLI are expected to produce similar values (Hair et al. 2006). The acceptable level of TLI varies between 0.90 and 1.00 depending on the complexity of the model and largeness of the sample size (Hair et al. 2006).

This section summarized the goodness-of-fit indices and general rules of thumb for interpretation. Although there are many other fit indices that may be used to make interpretations, it is not customary to use all of them, but select fit indices that will provide justification in a nutshell (Hair et al. 2006). Hair et al. (2006) explain since there is redundancy and overlap between fit indices, only selected indices by the researcher may be reported.

Following the customary practice, this study reports indices related to both absolute and incremental fit. Along with mandatory χ^2 and degrees of freedom values, the absolute fit indices of GFI, AGFI and RMSEA, as well as the incremental fit indices of NFI, CFI and TLI are reported.

Before advancing to results of the analysis, it is important to delineate the approach that will be used for SEM. Literature regarding SEM witnesses two competing approaches on the matter. The first one is one-step approach, in which only the overall fit of the model is tested, and the structural model is not regarded (Fornell and Yi 1992). Therefore, through one-step approach, only the validity of the measurement model can be reported.

The second approach is the two-step approach, in which assessment of the measurement model, followed by assessment of the structural model is reported (Anderson and Gerbing 1988). The essence of the two-step approach is extremely straight forward. Two-step approach asserts that it is not possible to test a theory with invalid measures. Accordingly, in order to test a theory, the researcher is to first define, refine, and validate the constructs of the study. The first step of the two-step approach is conducted through CFA, and only at the point, where the researcher can conclude, s/he has a valid estimation of the measurement model proceeds with the second step of structural model testing (Hair et al. 2006).

Structural theory testing differs from all other forms of multivariate analysis because its starting and the ending point is a theory. In other words, a structural theory is a visual diagram of a theory that implicates the direction of relationships between constructs, forcing a presupposed disposition on to the data. Therefore, structural theory testing

stems from a theory and seeks to contribute to theory building by demonstrating further relationships between constructs.

This study, using the two-step approach (Anderson and Gerbing 1988), starts with estimation of measurement model through CFA. Once validation of the measurement model is established, it proceeds to testing of the structural model. As the research model proposed is a recursive model, it ensures that it does not have fewer degrees of freedom than the estimation model (Hair et al. 2010). During testing of the structural model, CFA factorial pattern is used, and the model is tested using goodness-of-fit indices as explained above. In cases where the GOF indices are deemed insufficient modification indices are studied.

Modification indices are a suggested list of paths by SEM, which would reduce the χ^2 of the overall model. In doing so, every possible relationship that is not freed is calculated and a reduced χ^2 is estimated, had the paths been freed (Hair et al. 2006). Although the idea of improving the GOF may be tempting for the researcher, modification indices should be used cautiously since SEM produces modification indices on the basis of data, not the theory. In other words, although the data may suggest freeing the paths will improve the overall fit of the model, the paths can only be freed if they are consistent with the theory purported by the researcher. This suggests that the existence of empirical evidence is not considered sufficient for modifying the model unless the modification is supported by the theory.

4.4.6.3 Moderation analysis

A moderating effect is said to occur when a third variable alters relationship between the predictor and outcome variable in terms of strength and direction (Rose et al. 2004). Wu and Zumbo (2008, p. 370) assert “the moderation effect is more commonly known as the statistical term interaction effect, where the strength and direction of an independent variable on the dependent variable depends on the level or value of the other independent variable”.

When dealing with metric moderators, the moderation effect may be analyzed using two distinct methods (Hair et al. 2006). Through first method, “logical groups” are created

by the researcher (Hair et al. 2006, p. 871) and the differences are tested, where differences in group means are utilized. Through more advanced approach (Hair et al. 2006), the researcher creates interaction terms as it is customary when using the regression approach. As this research uses the interaction term approach, multi-group moderation will not be discussed further, and the next section will concentrate on moderation through interaction effect.

Interaction effect is a quite advanced statistical test that takes multiple exogenous variables as well as their indicators into account (Hair et al. 2006). This suggests a third variable to be created, which is inherently the interaction variable, and its indicators consist of the interaction effect created by the exogenous variable and the moderating variable. Yet, a single point needs to be guarded extremely important when creating interaction terms, dealing with continuous variables. Literature strongly suggests a continuous moderator to be centered before creating the interaction term (Rose et al. 2004). Wu and Zumbo (2008) explain the importance of this process as they argue that unless the moderating variable has a meaningful zero point, the cross-product term, which the researcher enters the regression analysis, will be meaningless since the interaction will not be taking the average effect of each individual predictor into account, altering the value of the regression coefficient.

This study tests moderation through centralized exogenous variables' interaction effect on the endogenous variable. Once the interaction effects are regressed on the endogenous variables, standardized estimates, critical ratios, and p-values are studied, and the insignificant paths are deleted. The statistically significant interaction effects are plotted and presented graphically in order to interpret the difference in slope through the newly created interaction effect (Gaskin 2012).

4.4.6.4 Mediation analysis

Rose et al. (2004) explain mediation is a simple causal model that attempts to explain why and how the cause take place (Wu and Zumbo 2008). Therefore, mediation analysis attempts to shed light on “the intermediary process that leads from the independent variable to the dependent variable” (Muller et al. 2005, p. 852). One of the most frequently used analogies for mediation is Wu and Zumbo's (2008) analogy of

dominos, where the mediator resembles the middle domino which carries the effect of the former to the latter.

Preacher and Hayes (2008) explain different approaches in mediation analysis in their widely cited study on contemporary approaches in mediation analysis. The most commonly used mediation test is Baron and Kenny's (1986) four steps approach of mediation testing. The essence of this approach is that there needs to be statistically significant correlations between the predictor variable, moderating variable, and the outcome variable for mediation test to succeed (Hair et al. 2006). Baron and Kenny (1986) approach is an iterative process where four concise steps are followed to understand the mediation effect. First step is the assessment of the direct effect of the predictor variable on the outcome variable. This step is essential in the sense that there needs to be significant path between the two variables suggesting that there is causal relationship to mediate. Put simply, if there is no causal link between the independent variable (IV) and the dependent variable (DV), there is no relationship to for the mediator to mediate. The second step is to assess the direct effect of the predictor variable on mediating variable. Going back to Wu and Zumbo's (2008) domino analogy, the predictor variable is the origin of source and causes the chain reaction called mediation. Therefore, if there is no statistically significant relationship between the IV and the mediating variable, it is not possible to argue a chain of effects. The third step of Baron and Kenny (1986) approach is the assessment of the direct effect mediating variable has on the dependent variable. If there exists no causal effect between the mediator and the outcome variable, it is not possible to argue a mediation effect. Yet, demonstrating the effect of mediator on the outcome variable says little about mediation as it falls short of demonstrating the domino effect. Consequently, in the fourth step, the effect of predictor variable on outcome variable is assessed taking the effect of mediating variable into account. If the relationship between the IV and the DV remains significant and unchanged when the mediator is introduced, then it is concluded that there is no mediation. In cases where the direct path from the IV to DV is significant, yet its effect is reduced, or becomes statistically insignificant, there is argued to be mediation. The former is labelled as partial mediation as the inclusion of the mediator does not nullify the path but only reduces its impact, where the latter is

labelled as full mediation since the effect of IV on DV is now completely transferred through the mediator (Hair et al. 2006).

Hayes (2009) introduces another modern approach of mediation testing as Sobel test (Sobel 1982). Yet, as explained by Baron and Kenny (1986), there is a significant shortcoming of the Sobel test (Sobel 1982) as it assumes that the distribution of the indirect effect is normal with zero skewness and kurtosis. Due to this shortcoming, the customary practice in marketing literature is to use the Sobel test as a supplement to the Baron and Kenny approach (Hayes 2009). Through such supplementation, the researcher is able to validate the results of the causal steps approach (Baron and Kenny 1986).

This research uses the Baron and Kenny (1986) four-step approach of mediation testing. In order to assess whether the drop in the standardized coefficient between the predictor and the outcome variable with the inclusion of the mediator is statistically significant, it performs a Sobel test (Sobel 1982). Through the Sobel test (Sobel 1982), the z-test statistic is studied to assess whether the null hypothesis should be rejected. In cases where the z' is greater than critical ratio of 1.96 ($p < 0.05$), it is concluded that the drop in the direct effect between the IV and the DV is statistically significant with the inclusion of the mediating variable.

This section summarized the methodology and research design used for this study. The next section will concentrate on the analysis and findings in light of the framework explained in this section.

5. ANALYSIS AND FINDINGS

The analysis and findings of the main survey will be discussed in this section. The results reached through various analytical techniques will be presented in order to assess the level of support for the causal links put forth through the research model. This section will begin with the computation of the sample size. Next, examination and preparation of the data for the multivariate data analysis will be explained. In doing so, analysis of missing data in terms of level and randomness, analysis of unengaged responses, analysis of outliers, and descriptive analysis of data including skewness and kurtosis will be included. Exploratory factor analysis, including the assessment of convergent and discriminant validity, as well as reliability will be followed by confirmatory factor analysis. The assessment of measurement models will be presented through confirmatory factor analysis. Finally, the results for the structural model will be introduced. Before moving on to the assessment of the model fit, testing of the multivariate assumptions; linearity and multicollinearity will be discussed. This section will conclude with the results of the hypothesis testing.

5.1 EXAMINATION AND PREPERATION OF THE DATA FOR MULTIVARIATE ANALYSIS

Examination and preparation of data is important especially for multivariate data analysis since the researcher has to ensure that the data meets underlying assumptions of multivariate techniques to be applied (Hair et al. 2010). In this initial stage, this study follows the steps outlined by Hair et al. (2010) to examine and prepare data for further analysis. These steps include:

- Analysis of missing data
- Analysis of unengaged responses
- Analysis of outliers
- Descriptive analysis of data including skewness and kurtosis

5.1.1 Determining the Level and Randomness of the Missing Data

Hair et al. (2010) argue that missing data can have serious impact on the results, especially, in multivariate data analysis. Consequently, it is crucial to determine the size and nature of the missing data before attempting to perform remedies.

First step in analysis of missing data is to determine the extent of the missing data per variable and per case. The goal at this stage is to ensure that the extent of missing data is within the acceptable limits, which then can be remedied by appropriate imputation techniques.

The most common way to determine the extent of missing data is tabulation of percentage of variables with missing data for each case, as well as the number of cases with missing data for each variable. The threshold level for missing data per case and per variable is, as mentioned before, accepted to be 10 percent (Hair et al. 2010).

The missing data analysis for this research showed extremely low levels of missing data. The highest percentage of missing data across the data set was 3.5 percent.

After determining the level of missing data, the next step is to determine the randomness of the missing data before the data can be remedied using any of the imputation methods (Hair et al. 2010).

Even when the missing data levels are as low as 3.5 percent as it was the case with this research, ensuring the randomness of the missing data is a necessary step to determine the appropriate data imputation technique. Therefore, the next step was to run the Missing Completely at Random (MCAR) Test to understand patterns of missing data within the data set.

MCAR Test is an analysis of missing data that compares the pattern of observed missing data with the expected pattern of missing data. The significance level of the MCAR test indicates the result, in which a non-significant result signals that the missing data is distributed in a random manner (Hair et al. 2010).

The missing data analysis for the data was concluded using MCAR Test and results showed significance level was greater than 0.05 threshold level ($p = 0.354$, $\chi^2 =$

4308.056, $df = 4274.01$). As the result of the MCAR Test, it was concluded that the missing data levels that were well below the acceptable level of 10 percent, were missing at a random manner allowing researcher to remedy the data for missing values.

Before moving onto applying remedies, the exceptionally low missing data levels should be commented on and associated with the data collection method of the study. 81 percent of the passengers who have reviewed the opening screen of the online survey have taken the survey, meaning the drop out percentage was limited to 19 percent. The extremely high response rate is thought to be the result of the fact that respondents take the online survey at their free-will, relieving them from external pressures of survey answering (Lefever et al. 2007). Furthermore, it can be argued that the page informing the passenger about the nature, duration, and the aim of the survey at the end of the online check-in page was very clear and detailed, only the passengers who actually intended to take the survey agreed to do so and were directed to the survey page. Similarly, another clear advantage of the online survey method was argued to be the fact that the respondents were able to move through the questions at their own pace, going back and forth on different screens as they pleased without being forced to answer every single question as they surfed (Lefever et al. 2007). Such freedom may also be argued as the reason for high response rate with as little as 3.5 percent of missing data.

5.1.2 Determining Unengaged Responses

Before advancing to missing data imputation, the researcher took another step to ensure the generalizability of the findings by testing the data for unengaged responses. Unengaged responses are defined as those responses coming from respondents, which are clearly providing no variation through their answers (Gaskin 2012). Although the responses of unengaged respondents seem to have value for each variable, they are still considered a threat for the generalizability of the findings since they tend to fatten up the data set without providing any sort of variation. The reason for determining the level of unengagement before missing data imputation is not to grant data with false variation, simply as a result of missing data imputation (Gaskin 2012).

In order to determine the responses of unengaged respondents, the standard deviation of answers for each case were calculated. Gaskin (2012) argues that threshold level for

variation is 0.50, yet any case with standard deviation less than 0.60 should be visually examined.

The standard deviation of responses showed 56 cases had a standard deviation in answers less than 0.50. The 56 cases were deleted. Cases with standard deviation between 0.51 and 0.60 were visually examined to determine patterns of unengagement. After the visual inspection, cases with standard deviation up to 0.58 percent deleted. The total of cases deleted for unengaged responses were 67.

5.1.3 Missing Data Imputation

Once ensuring the level of missing data is at an acceptable level and deleting unengaged responses in order to secure a lean data set, the next step is to impute missing data using an appropriate data imputation method.

According to Hair et al. (2010), when missing values are determined to be missing at a random manner, any imputation technique may be used for replacement. Therefore, the researcher opted for imputation by using replacement values with regression imputation. Regression imputation is an advanced missing value imputation method that uses regression analysis. In this method, predictive equations are formed to determine the missing values per variable in relationship to other variables of the data set (Hair et al. 2010, p. 61). In other words, predictive values for the missing data is computed using the equations, thus the replacement value is predicted and derived from actual observed values.

According to Hair et al. (2010, p. 63) regression imputation has clear advantages of employing actual relationships among variables and replacement values calculated based on an observation's own values on other variables. Based on such clear advantages, the data set was remedied for missing data by regression imputation.

5.1.4 Analysis of Outliers

Outliers are defined as observations which have unique and distinctly different characteristics from all other observations (Hair et al. 2010). Since by nature, what level or value may be categorized as an outlier depend on the context of the study, it is not possible to conclude that every value that has significant deviation from other values is

an outlier. Yet, the researcher must use a detection method to detect and evaluate the nature of outliers using univariate, bivariate or multivariate detection methods.

Due to the complexity of the research model, housing significantly high number of variables, multivariate detection method was deemed appropriate. Through multivariate detection method, Mahalanobis D^2 Test was run, and very rigorous significance level of 0.005 was accepted as the threshold level.

Mahalanobis D^2 test is important to measure the “multidimensional position of each observation relative to some common point” (Hair et al. 2006, p. 75). In other words, through this test the researcher is able to generate a single value for each of the observed variable to conclude how farthered the observation is from the general distribution of the data. The higher D^2 value is, the more divergence from normal distribution, which suggests the observation maybe an outlier. According to Hair et al. (2010) for small samples 2.5, for larger samples 4 should be accepted as rule of thumb for D^2/df value.

Mahalanobis D^2 test showed that only three observations produced a D^2/df measure greater than 2.5 on 0.005 significance level. Although the data for this research was considered to be large one, the threshold level was reduced to 2.5 and three observations were visually examined to describe and profile the outliers. Yet, since the result of the visual examination was not conclusive, and the three outliers were below the suggested threshold level of 4, so they were retained by the judgment of the researcher.

5.1.5 Test of Normality

Test of normality is defined as the shape of data distribution for the metric variables (Hair et al. 2010). Although test of normality in the form of skewness and kurtosis are suggested practice in data analysis, a large sample set is always considered to “diminish the detrimental effects of nonnormality” (Hair et al. 2010, p. 80).

On the basis of analysis of skewness and kurtosis, it was concluded that many of the variables departed from normal distribution. Yet, this was expected and overlooked since structural equation modelling using maximum likelihood estimators are acceptable even when the data is not normally distributed (Bentler and Chou 1987, p. 89). Furthermore, following Hair et al. (2010), the sample size was concluded to be large

enough to diminish the effects of non-normality. Accordingly, no remedies were applied for nonnormality.

As for the final step of further preparation of data, the answer to control question was checked. As discussed previously, the survey consisted a control question that asked the respondents whether the online check-in completed was carried out for the passenger himself/herself or a group that he or she is a part of. The control question was designed to eliminate individuals who completed the survey, but was not flying himself/herself, as it was argued that the antecedent factors that shaped motivation as well as attitudinal constructs, perceptions of value and satisfaction would be different for those who have completed the survey on behalf of the passenger who would actually be taking the flight. Out of 1224 cases remaining, 129 cases showed the individual who had completed the online check-in and filled the survey was not flying on the checked flight. The 129 cases were deleted and remaining 1095 cases were examined for sample characteristics.

5.2 SAMPLE CHARACTERISTICS

One of the most important analysis that introduces the nature of the data to the researcher is the sample characteristics. Sample characteristics in the form of gender, marital status, age, education, income, and travel purpose was evaluated to grasp insight of the sample's profile. Table 5.1 summarizes the sample characteristics on mentioned dimensions, along with sample frame's demographic information received from the airline company, as well as the distribution of the main population.

Table 5.1: Demographics of the sample population with comparison to population of online check-in passengers and main population

Demographics	Sample data %	Online check-in population %*	Main population %**
Gender			
Female	24.7	30.00	49.81
Male	75.3	70.00	50.19
Age			
18-29	20.6	20.00	26.90
30-39	29.6	25.00	24.06
40-49	27.4	30.00	19.21
50-59	17.4	18.00	14.15
60+	5.0	7.00	15.68
Marital status			
Single	32.8	n/a	35.66
Married	67.2	n/a	64.34
Education level			
Primary school	0.3	n/a	26.14
Secondary school	0.8	n/a	11.55
High school	8.3	n/a	42.89
Under graduate	53.8	n/a	17.82
Graduate	36.8	n/a	1.60
Income level			
Less than 1000 TL	1.2	n/a	n/a
1001 - 2000 TL	4.7	n/a	n/a
2001-3000 TL	7.9	n/a	n/a
3001-4000 TL	8.9	n/a	n/a
4001-5000 TL	12.1	n/a	n/a
5000+ TL	65.2	n/a	n/a
Travel purpose			
Leisure	45.3	n/a	n/a
Business	54.7	n/a	n/a

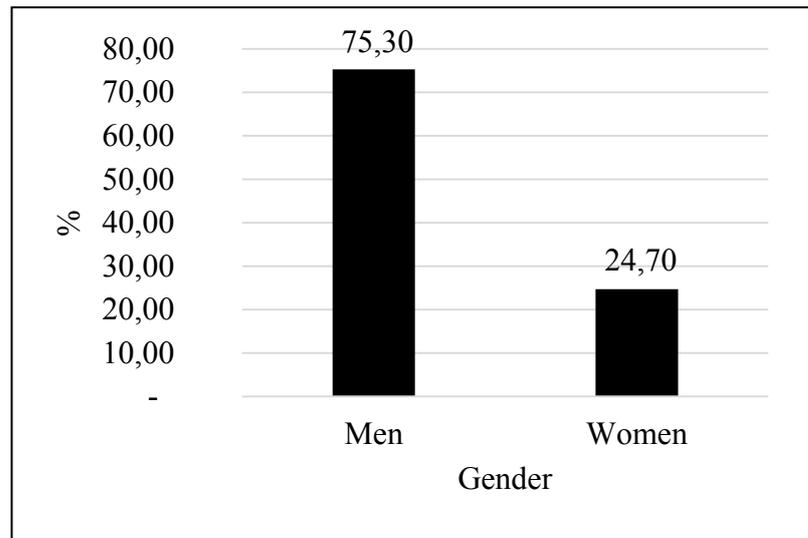
* Demographic information received from airline executives during in-depth interviews on passengers who completed online check-in within the past year

** Information obtained from web page of Turkish Statistical Institute (2013) accessed through: <http://www.turkstat.gov.tr/UstMenu.do?metod=temelist> [on 18 August 2013]

The characteristics of the sample show great resemblance to the population characteristics that were received from the airline company on passengers who have completed online check-in previously. However, the population that uses online check-in differs greatly from main population.

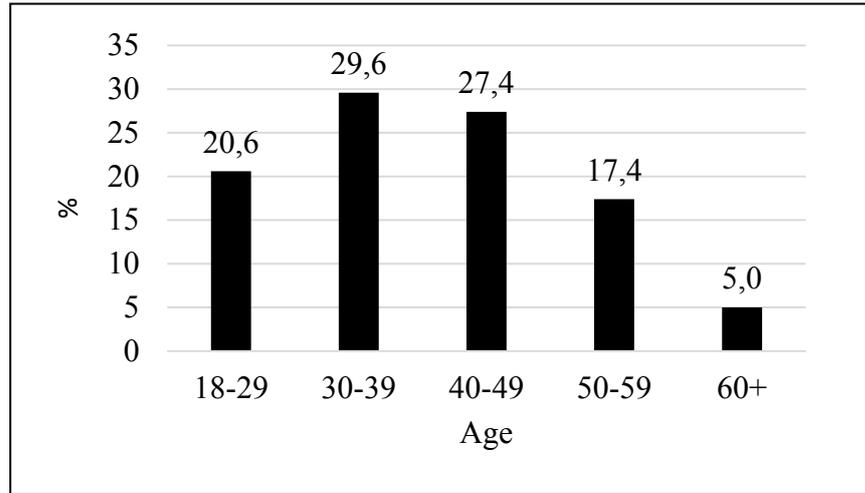
The analysis showed that the majority of the sample (75.3 percent) were male, leaving the female respondents with 24.7 percent. These figures corresponds to the gender distribution of passengers who have used online check-in previously according to data received from the airline company ($\pi_{\text{male}} = 70$ percent, $\pi_{\text{female}} = 30$ percent). Figure 5.1 represents distribution of gender among sample.

Figure 5.1: Gender distribution among sample data



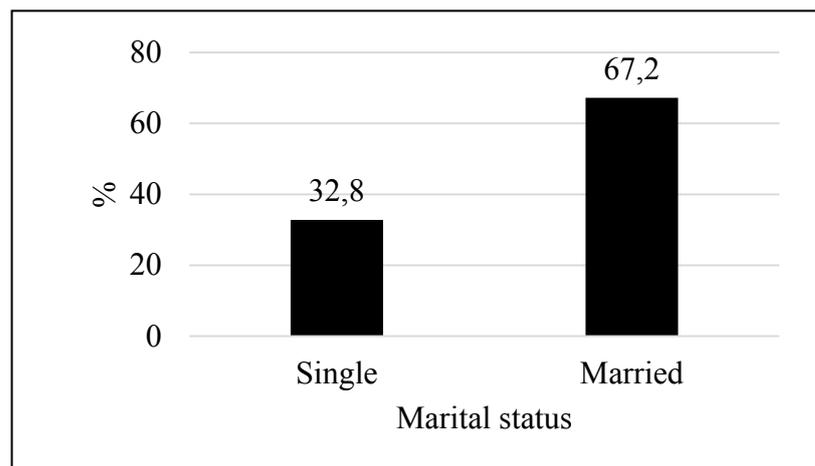
Likewise, the age distribution was similar with the age distribution obtained from the airline company. The respondents that belonged to the age group of below 29 years of age made up 20.6 percent of the respondents. The corresponding percentage of the sample frame was 20 percent. Similarly, 57 percent of the respondents were between the ages of 30 through 49 ($p_{30-39} = 29.6$ percent, $p_{40-49} = 27.4$ percent). The respondent's age showed correspondence in this age category, too, as passengers between the ages of 30 through 49 made of 55 percent of the sample frame. The age categories of 50 through 59 and above 60 were again similar to the age categories of the sample frame ($p_{50-59} = 17.4$ percent, $\pi_{50-59} = 18.0$ percent; $p_{60+} = 5.0$ percent, $\pi_{60+} = 7.0$ percent). The mean age for the respondents were 39.41 and the median was 39. The youngest respondent was 18 years of age with wisest respondent being 76 years of age. Figure 5.2 shows the age distribution of the respondents.

Figure 5.2: Age distribution among sample data



The majority of the respondents were married ($p_{\text{married}} = 67.2$ percent, $p_{\text{single}} = 32.8$ percent). Although the airline company was unable to provide information on marital status to compare the sample to sample frame, the percentages of married and single respondents corresponds to the division among main population ($\pi_{\text{married}} = 64.34$ percent, $\pi_{\text{single}} = 35.66$). Figure 5.3 shows the distribution of the sample with regards to marital status.

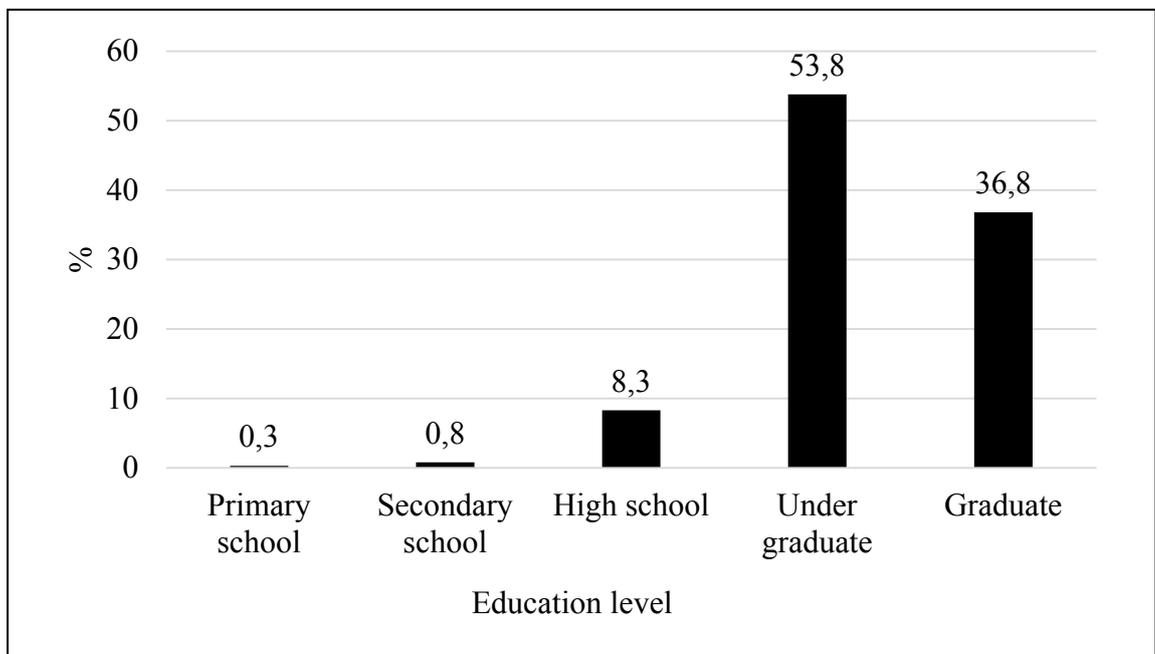
Figure 5.3: Distribution of marital status among sample data



Although information on online check-in passengers' income and education level were not received from the airline company, during the in-depth interviews the airline company confirmed that such categories diverged highly from the main population.

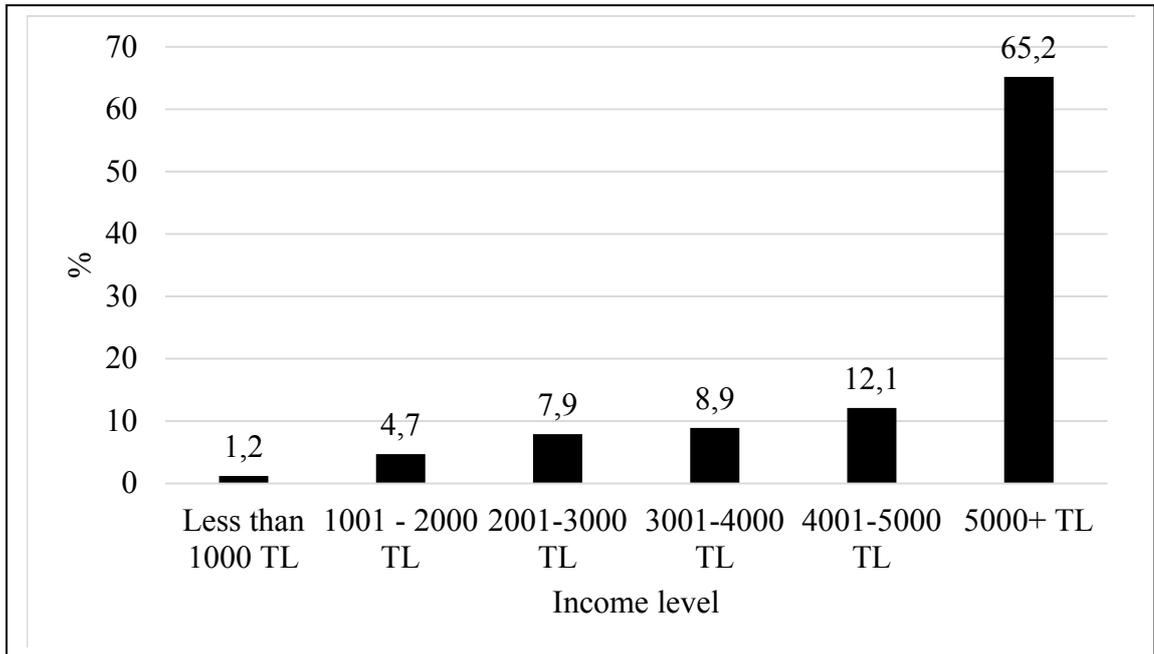
Thein-depth interviews revealed that online check-in passengers belonged to very high income and education levels compared to the main population. Likewise, the sample characteristics showed that over 90 percent of the respondents had at least undergraduate degree ($p_{\text{undergraduate}} = 53.8$ percent, $p_{\text{graduate}} = 36.8$ percent) and over 65 percent belonged to the highest income group ($p_{5000+ \text{ TL}} = 65.2$ percent). Although, these figures are in no way representative of the Turkish population, the airline company confirmed that the passengers who had used online check-in in the past in fact diverged highly on such dimensions. Figures 5.4 presents the distribution of sample data with regard to education level.

Figure 5.4: Distribution of education level among sample data



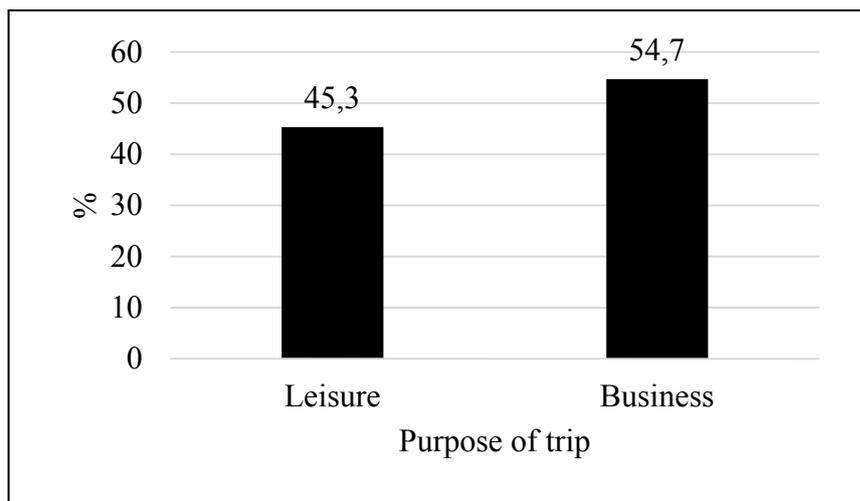
The distribution of income level among sample is presented in Figure 5.5. As stated above over 65 percent of the passengers belonged to the highest income group with 5000+TL income. The passengers who earned less than 1000TL constituted only 1.2 percent of the passengers.

Figure 5.5: Distribution of income level among sample data



Finally, the respondents who used online check-in for a business trip was nearly 10 percent more than those, who have used it for travels of leisure ($p_{\text{business}} = 54.7$ percent, $p_{\text{leisure}} = 45.3$ percent). Figure 5.6 presents the distribution of the sample regarding the purpose of the trip.

Figure 5.6: Distribution of travel purpose among sample data



5.3 EXPLORATORY FACTOR ANALYSIS

Although Confirmatory Factor Analysis (CFA) is the first step towards Structural Equation Modelling (SEM) (Gerbing and Anderson 1988), Exploratory Factor Analysis (EFA) can still be helpful in this final stage to simplify and validate the scales used, before moving on the multivariate analysis (Babin et al. 2000). Even though the use of EFA is advised, limited to the initial stages of the study such as the analysis of the pilot study (Aaker 1997), a rigorous EFA of the main study actually gives insight to the researcher and prevents excessive iterative analysis during CFA. Therefore, in order to have a better understanding of the data and how it fits to the research model theorized, EFA has been conducted for the main study.

While conducting EFA, different groups were formed relying on relevant theory and literature review. As Menon et al. (1996) argue, when there is significant number of constructs to be analyzed, assessing them in groups results in more reliable results. Same approach was maintained during CFA; however, before moving on the testing of the structural model, CFA of the whole hybrid model has been conducted. The next section elaborates the analysis of the EFA for the main study.

The first set of factors that were tested through EFA was the customer linked factors, which are presented in Table 5.2. On the contrary to initial EFA performed during pilot study, customer linked factors in terms of self-capacities and individual characteristics were held subject to EFA together, since the result of the EFA would constitute the base for CFA in the next stage. Therefore, more rigorous approach was deemed appropriate. EFA for the customer linked factors resulted in seven factor solution. All of the items for the construct of skepticism, one item from discomfort and two items from resource capacity were deleted due to low communalities and low factor loadings. Final factor solution resulted in MSA of 0.878, which Hair et al. (2010) consider to be meritorious. Furthermore, Bartlett Test of Sphericity (BTS) was significant (BTS = 17975.497, $p = 0.000$). The seven factors explained 67.298 percent of the variance for customer linked factors, exceeding the recommended threshold level of 60 percent (Hair et al. 2006). The reliability levels of the six factors investigated varied between 0.808 and 0.937 ($\alpha_{\text{EXPCAP}} = 0.937$, $\alpha_{\text{RESCAP}} = 0.873$, $\alpha_{\text{RISK}} = 0.808$, $\alpha_{\text{NEED}} = 0.840$, $\alpha_{\text{OPTIM}} = 0.871$, $\alpha_{\text{INNOV}} = 0.895$, $\alpha_{\text{DISCOM}} = 0.845$).

Table 5.2: Exploratory factor analysis results for customer linked factors

Factors and related items	Factor loadings	Cronbach Alpha
Expertise capacity		
I commonly use technological systems in my daily life	0.595	0.937
I am capable of using technology	0.931	
I am confident in my ability to use technology	0.995	
My previous experience enables me to use technology more efficiently	0.850	
I am confident in my knowledge on technology	0.873	
I use variety of technological products and services	0.716	
Resource capacity		
I have all the necessary technological devices that will make my life easier	0.830	0.873
I have technological devices that will enable me to access Internet whenever I want	0.806	
Risk-taking capacity		
I always try to avoid situations involving a risk of getting into trouble	0.664	0.808
I always play it safe even when it means occasionally losing out on a good opportunity	0.903	
I am generally a cautious person in my actions	0.724	
Need for interaction		
Human contact in providing services makes the process enjoyable for me	0.769	0.840
It bothers me to use a machine when I could talk to a person instead	0.629	
I like interacting with the person who provides the service	0.952	
Personal attention by the service employee is important to me	0.673	
Optimism		
Technology gives me more control over my daily life	0.835	0.871
Technology gives me more freedom of mobility	0.890	
Products and services that are the newest technology make my life much more efficient	0.743	
Innovativeness		
Other people come to me for advice on new technologies	0.757	0.895
I am among the first in my circle of friends to acquire new technology when it appears	0.763	
I can keep up with the latest technological developments in my area of interest	0.652	
Compared to other people, I know a lot more about new technologies	0.918	
I consider myself an expert on technological products	0.871	
Discomfort		
I feel intimidated by technology	0.700	0.845
I feel apprehensive about using technology	0.873	
I am overwhelmed by how complicated technological systems may be	0.809	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.878		
Total variance explained: 67.298%		
Bartlett Test of Sphericity: 17975.497 p: 0.000 <0.05		
Note 1: 2 items of Resource capacity, 1 item of Discomfort and all four items of Skepticism were deleted to due to communalities and factor loadings below 0.50.		
Note 2: Maximum Likelihood method with promax rotation was used		

In order to make an assessment of convergent validity, the loading of each indicator as well as the average factor loadings for every factor were checked. The results showed

that the factors loaded highly on their expected factors with average loadings exceeding 0.70 demonstrating convergent validity. Table 5.3 represents the results of convergent validity for customer linked factors.

Table 5.3: Convergent validity through factor loadings for customer linked factors

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Expertise capacity	✓	0.827
Resource capacity	✓	0.818
Risk-taking capacity	✓	0.764
Need for interaction	✓	0.756
Optimism	✓	0.823
Innovativeness	✓	0.792
Discomfort	✓	0.794

The fact that there were no cross loadings between factors was a clear indication of discriminant validity. Also, factor correlations matrix demonstrated that there were no factors with inter-correlations over 0.70, meaning no two factors shared a variance over 50 percent indicating discriminant validity. The highest variance was shared was between the factors of discomfort and expertise capacity with 34.93 percent, still well below the accepted level of 50 percent. Table 5.4 presents assessment of discriminant validity for customer linked factors.

Table 5.4: Discriminant validity through factor correlation matrix for customer linked factors

Factor correlations							
Expertise capacity	1.000						
Resource capacity	0.046	1.000					
Risk-taking capacity	-0.094	0.010	1.000				
Need for interaction	0.076	0.504	0.023	1.000			
Optimism	-0.532	-0.004	0.217	-0.060	1.000		
Innovativeness	-0.136	0.006	0.453	0.003	0.259	1.000	
Discomfort	0.591	0.037	-0.084	0.060	-0.459	-0.098	1.000

The EFA conducted on service linked factors resulted in five factor solution, which was in line with literature review, previous empirical findings and theory. The MSA for service linked factors was 0.864, which is greater than the 0.80 level, which Hair et al. (2010) consider meritorious. BTS was satisfactory, confirming the results of EFA (BTS = 12546.749, $p = 0.000$). The variance explained by the five factors of service linked factors was 75.402 percent, well above the threshold level of 60 percent. Furthermore, Cronbach alpha's of all factors were greater than 0.70, suggesting all factors had sufficient internal consistency ($\alpha_{\text{COMPAT}} = 0.964$, $\alpha_{\text{RELADV}} = 0.874$, $\alpha_{\text{TRIAL}} = 0.860$, $\alpha_{\text{OBSER}} = 0.830$, $\alpha_{\text{CMPLX}} = 0.906$). The results of the exploratory factor analysis for the service linked factor are presented in Table 5.5.

Table 5.5: Exploratory factor analysis results for service linked factors

Factors and related items	Factor loadings	Cronbach Alpha
Compatibility		
Using online check-in system is compatible with my lifestyle	0.950	0.964
Checking myself in online fits well with the way I like to get things done	0.959	
Using online check-in system is compatible with my needs	0.947	
Relative advantage		
Using online check-in system improves travelling	0.693	0.874
Using online check-in system is more advantageous than other methods of checking in	0.929	
Using online check-in system is the best way to check myself in	0.742	
Trialability		
I would like the opportunity to try out the online check-in system before using it	0.872	0.860
If there was any change in the online check-in system, it would be helpful to try out the new system before using it	0.730	
In case of a change in the online check-in system, it would be good if they would show me how to use the new system	0.862	
Observability		
I would have no difficulty telling others about the advantages of using the online check-in system	0.528	0.830
I could communicate to others about the outcomes of using the online check-in system	0.851	
The advantages of using the online check-in system is obvious to me and others	0.913	
Complexity		
Online check-in system is cumbersome to use	0.893	0.906
It is difficult to use the online check-in system	0.914	
I feel frustrated using the online check-in system	0.829	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.864		
Total variance explained: 75.402%		
Bartlett Test of Sphericity: 12546.749 p: 0.000<0.05		
Note 1: All items were retained		
Note 2: Maximum Likelihood method with promax rotation was used		

All indicators loaded highly on their expected factors with factor loadings and communalities greater than 0.50. The average loadings for all factors were above 0.70, which is accepted to be the affirmation needed for convergent validity. The results for the assessment of convergent validity are presented in Table 5.6.

Table 5.6: Convergent validity through factor loadings for service linked factors

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Compatibility	✓	0.952
Relative advantage	✓	0.788
Trialability	✓	0.821
Observability	✓	0.764
Complexity	✓	0.879

Assessment for discriminant validity was conducted through analyzing the factor correlation matrix. The correlation matrix revealed that no two factors' squared correlations for shared variance was over 50 percent, indicating discriminant validity. The highest variance shared was between compatibility and complexity with 42.12 percent. Furthermore, there were no cross loadings between indicators. Table 5.7 summarizes the results for discriminant validity.

Table 5.7: Discriminant validity through factor correlations matrix for service linked factors

Factor correlations					
Compatibility	1.000				
Relative advantage	-0.339	1.000			
Trialability	0.322	-0.025	1.000		
Observability	0.383	-0.404	0.242	1.000	
Complexity	0.649	-0.414	0.333	0.571	1.000

EFA for company linked factors were performed on service quality and communication quality. Inconsistent with the theory, service quality items formed in single factor solution. Problems with achieving a five factor solution as suggested by Parasuraman et al. (1988) have been reported in literature before (Gagliano and Hathcote 1994, Bouman and van der Wiele 1992, Carman 1990). Uni-dimensionality of the

SERVQUAL(Parasuraman et al. 1988) (extraction of a single factor) has also been recognized (Buttle 1996, Babakus et al. 1993, Cronin and Taylor 1992).

In the EFA of service quality items, three indicators from the subdimension of reliability were deleted due to factor loadings below 0.50. All other factors formed a single construct with loadings above 0.50 and an average loading of 0.722. The reliability of the scale was 0.965 well above the accepted limit of 0.70. Communication quality, in line with the theory, formed a single factor solution also, with strong communalities and factor loadings. Average loading for the items that made up communication quality was 0.877. As the result of EFA performed on company linked factors, KMO of 0.968 and BTS of 23158.519 at the significance level of 0.000 indicated that EFA was applied correctly. The two factors were able to explain 66.416 percent of the variance in company linked factors. The results of the EFA are presented in Table 5.8.

Table 5.8: Exploratory factor analysis results for company linked factors

Factors and related items	Factor loadings	Cronbach Alpha
Service quality		
Employees of XYZ are polite	0.797	
Employees of XYZ give me personal attention	0.889	
XYZ tells me exactly when the service will be performed	0.596	
Employees of XYZ are competent in what they do	0.821	
Employees of XYZ respond to my requests promptly	0.837	
XYZ's physical facilities are visually appealing	0.679	
XYZ has my best interest at heart	0.657	
The appearance of the physical facilities of XYZ is in keeping with the type of service provided	0.639	
I feel safe in my transactions with XYZ's employees	0.788	
When I have problems, XYZ is sympathetic and reassuring	0.659	0.965
Employees of XYZ are always willing to help me	0.882	
I receive prompt service from XYZ's employees	0.792	
XYZ has up-to-date equipment	0.513	
XYZ gives me individual attention	0.751	
XYZ provides its services at the time it promises to do so	0.559	
Employees of XYZ know what my needs are	0.722	
I can trust the employees of XYZ	0.691	
Communication quality		
I feel XYZ communicates with me in a timely manner	0.788	
I feel the information provided by XYZ is accurate	0.906	
I feel XYZ provides me all the information that I need to know	0.922	0.947
I feel the information provided by XYZ is adequate	0.899	
I feel the information provided by XYZ is credible	0.869	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.968		
Total variance explained: 66.416%		
Bartlett Test of Sphericity: 23158.519 p: 0.000 < 0.05		
Note 1: 3 items of Service quality with communalities and factor loadings less than 0.50 have been deleted.		
Note 2: Maximum Likelihood method with promax rotation was used.		
Note 3: XYZ will be replaced by the airline's name.		

Assessment of convergent validity was carried out using the factor loadings of the indicators. Hair et al. (2006) suggest that in order to conclude convergent validity, the indicators' factor loadings need to exceed 0.50 threshold level. In addition, the average loading of the indicators for each factor needs to be greater than 0.70. In light of these suggestions, the convergent validity was concluded to be achieved. The assessment of convergent validity for company linked factors is presented in Table 5.9.

Table 5.9: Convergent validity through factor loadings for company linked factors

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Service quality	✓	0.722
Communication quality	✓	0.877

The two factors of quality is argued to be discriminant from each other as the shared variance between them was found to be 40.70 percent. The factor correlation matrix in Table 5.10 summarizes the results for discriminant validity.

Table 5.10: Discriminant validity through factor correlations matrix for company linked factors

Factor correlations		
Service quality	1.000	
Communication quality	0.638	1.000

EFA for situational factors were performed next. All three factors theorized for situational factors resulted in line with theory and literature review. MSA and BTS were 0.801 and 8746.318 ($p = 0.000$) respectively, indicating a well factor solution for situational factors. All items loaded highly on their expected factors, with factor loadings exceeding 0.50. The reliabilities of the constructs were well above 0.70 and the three factors explained 75.070 percent of the variance for situational factors ($\alpha_{ACCESS} = 0.847$, $\alpha_{PERCROWD} = 0.940$, $\alpha_{PERWAIT} = 0.944$). Table 5.11 shows the results of the EFA for the situational factors.

Table 5.11: Exploratory factor analysis results for situational factors

Factors and related items	Factor loadings	Cronbach Alpha
Access convenience		
Online check-in page loads instantly	0.837	0.847
I can complete online check-in from the comfort of my home or office	0.616	
Accessing the online check-in page is easy	0.905	
I can access the online check-in system through every web browser	0.698	
Perceived crowdedness		
The check-in counters at the airport are too crowded	0.961	0.940
The check-in counters at the airport are too busy	0.970	
The airport departure hall is too hectic	0.818	
Perceived waiting time		
Checking in at the counters takes longer than using online check-in	0.873	0.944
If I have not already checked in online, I have to spend more time at the airport	0.927	
Checking in at the counters is the most time consuming way to check-in	0.962	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.801		
Total variance explained: 75.070%		
Bartlett Test of Sphericity: 8746.318 p: 0.000 < 0.05		
Note 1: All items were retained		
Note 2: Maximum Likelihood method with promax rotation was used		

In order to make an assessment of convergent validity, factor loadings were studied. Factor loadings above 0.50 as well as average factor loadings exceeding 0.70 level were indicators that convergent validity was achieved. Table 5.12 summarizes the assessment of convergent validity for situational factors.

Table 5.12: Convergent validity through factor loadings for situational factors

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Access convenience	✓	0.764
Perceived crowdedness	✓	0.916
Perceived waiting time	✓	0.921

The discriminant validity assessment was carried out through the factor correlation matrix. The matrix showed that there were no cross loadings and that no two constructs

shared a variance over 50 percent asserting discriminant validity. Discriminant validity results are presented in Table 5.13.

Table 5.13: Discriminant validity through factor correlations matrix for situational factors

Factor correlations			
Access convenience	1.000		
Perceived crowdedness	0.463	1.000	
Perceived waiting time	0.101	0.192	1.000

EFA for moderators resulted in two factor solution as expected. All items loaded highly on their expected factor. KMO for the moderating factors were 0.820 with BTS of 7179.870 ($p = 0.000$) indicating EFA was performed accurately. The reliability levels of the role clarity and enjoyment were 0.936 and 0.892, respectively. Therefore, internal consistency was argued to be achieved (Peter 1979). The two factors explained 78.38 percent of the variance. The EFA results for the moderating variables are presented in Table 5.14.

Table 5.14: Exploratory factor analysis results for moderating variables

Factors and related items	Factor loadings	Cronbach Alpha
<i>Role clarity</i>		
I feel certain I can check myself in online successfully	0.879	
I know what is expected of me when I am checking myself in online	0.861	0.936
The steps in the process of online check-in are clear to me	0.916	
I am sure how to use the online check-in system	0.900	
<i>Enjoyment</i>		
Using the online check-in is fun	0.956	
Using the online check-in is exciting	0.974	0.892
Using the online check-in is interesting	0.680	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.820		
Total variance explained: 78.380%		
Bartlett Test of Sphericity: 7179.870 $p: 0.000 < 0.05$		
Note 1: All items were retained		
Note 2: Maximum Likelihood method with promax rotation was used		

Hair et al. (2006) argue that convergent validity is said to be achieved when the indicators load highly on expected factors with average loadings over 0.70. Assessing convergent validity for the moderators, it was concluded that all factor loadings were above the cutoff point of 0.50 with average factor loadings of 0.889 for role clarity and 0.870 for enjoyment. Therefore, it was concluded that the indicators converged on the factors as proposed. Table 5.15 shows the results of assessment of convergent validity for moderators.

Table 5.15: Convergent validity through factor loadings for moderating variables

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Role clarity	✓	0.889
Enjoyment	✓	0.870

The shared variance between moderators were less than 18 percent, indicating discriminant validity as presented in factor correlation matrix in Table 5.16. Since the shared variance between two factors does not exceed the cutoff point of 50 percent, and there are no cross loadings between indicators, they were concluded to be discriminant factors.

Table 5.16: Discriminant validity through factor correlations matrix for moderating variables

Factor correlations		
Role clarity	1.000	
Enjoyment	0.417	1.000

EFA for the motivational and attitudinal items was carried out with a more rigorous approach to prevent further complexity during CFA stage. The factor analysis resulted in three factor solution, which was consistent with theory. However, four items related to extrinsic motivation showed communalities less than 0.30 and were deleted. The final rotation showed KMO to be equal to 0.889 approaching the 0.90 level which Kaiser (1974) considers marvelous. BTS was 11910.688 ($p = 0.000$) indicating a well factor

solution. The factors explained 76.719 percent of the variance, which is well above the threshold level of 0.60. The factors' reliability levels were all above 0.90 ($\alpha_{\text{MOTIV}} = 0.920$, $\alpha_{\text{ATTIT}} = 0.915$, $\alpha_{\text{INTENT}} = 0.936$), which are well above the accepted threshold level. Table 5.17 shows the results for EFA for motivational and attitudinal variables.

Table 5.17: Exploratory factor analysis results for motivational and attitudinal variables

Factors and related items	Factor loadings	Cronbach Alpha
Motivation		
Using the online check-in would provide me with personal feelings of accomplishment	0.876	0.920
Using the online check-in would provide me with feelings of independence	0.696	
Using the online check-in would allow me to feel innovative in how I interact with a service provider	0.889	
Using the online check-in would allow me to have increased confidence in my skills	0.942	
Attitude towards co-production in SSTs		
Using the online check-in is a good idea	0.818	0.915
I like the idea of using the online check-in	0.825	
I have a positive attitude toward using the online check-in	0.837	
Using the online check-in is a wise move	0.932	
Intention to use SSTs		
I intend to use online check-in next time I travel	0.924	0.936
I intend to use the online check-in system more frequently in the future	0.900	
Online check-in will be my first choice next time I travel	0.908	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.889		
Total variance explained: 76.719%		
Bartlett Test of Sphericity: 11910.688 p: 0.000 < 0.05		
Note 1: Four items of motivation with communalities and factor loadings less than 0.50 have been deleted		
Note 2: Maximum Likelihood method with promax rotation was used		

The indicators in question showed high factor loadings exceeding the 0.50 level, with average factor loadings over 0.70 limit. These levels indicate that the factors have convergent validity, meaning their indicators converge on the factors as proposed by the theory (Hair et al. 2006). The assessment for convergent validity is presented in Table 5.18.

Table 5.18: Convergent validity through factor loadings for motivational and attitudinal variables

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Motivation	✓	0.851
Attitude towards co-production in SSTs	✓	0.853
Intention to use SSTs	✓	0.911

In order to conclude the analysis for discriminant validity it was confirmed that there were no cross loadings between items. Furthermore, the factor correlations matrix assured that there were no shared variances over 50 percent between any two constructs. The highest correlation was between motivation and attitude towards co-production in SSTs with 0.543, indicating a shared variance of 29.48 percent. Assessment of discriminant validity is presented in Table 5.19.

Table 5.19: Discriminant validity through factor correlations matrix for motivational and attitudinal variables

Factor correlations			
Motivation	1.000		
Attitude towards co-production in SSTs	0.543	1.000	
Intention to use SSTs	0.293	0.465	1.000

The final stage was performing EFA for the outputs of the research model including perceived values, satisfaction, future intention to co-produce, and attitude towards co-creation of value. However, before moving on to analysis of output variables all together, researcher decided to get a better understanding of the rather complex construct of attitude towards co-creation of value, which was generated by the researcher for this study.

Attitude towards co-creation scale was defined by the researcher as individuals' evaluation on realizing increased value-in-use by interactive process of learning together through continuous dialog. Fifteen items, that were originally generated, which

have been modified as the result of content validity, had showed high factor loadings and reliability levels during pilot study phase. Therefore, all fifteen items were retained to be further addressed according to the results of the main study.

EFA performed on fifteen items that made up the factor of attitude towards co-creation of value showed a single factor solution, where all items had factor loadings above 0.50. Yet, due to relatively low factor loadings of some of the indicators, the average loading of the scale did not meet 0.70 average factor loading criterion. Furthermore, although all fifteen items presented reliability of 0.728, several items did not contribute to overall reliability of the measure. Moreover, items that had relatively low factor loadings had low communalities, ranging between 0.412 through 0.506. Table 5.20 summarizes the factor loadings of the fifteen items.

Table 5.20: Exploratory factor analysis for attitude towards co-creation scale

Factors and related items	Communalities	Factor loadings	Cronbach Alpha
I would like to take advantage of XYZ 's expertise in order to increase the value of my trip	0.848	0.899	
I would like to explain XYZ my idea of perfect trip	0.412	0.532	
I would like to receive recommendations from XYZ to increase the value of my trip	0.501	0.511	
I would like to pass on my travel experiences to XYZ , so other can benefit from my experience	0.506	0.518	
Staying in contact with XYZ helps me receive information from them on my travel destination	0.499	0.509	
I would like to co-create best travel experience with XYZ	0.796	0.870	
I would like XYZ to support me for me to have a better trip	0.856	0.947	0.728
I would like XYZ to present me with different options for me to have a better trip	0.808	0.936	(0.930)
I would like XYZ to try to understand my needs and wants regarding my trip	0.452	0.501	
I would like give feedback to XYZ about the new information I acquire in my travel destination	0.485	0.506	
I would like to be exchanging messages with XYZ	0.498	0.513	
I would like to exchange ideas with XYZ to enrich my travel experience	0.718	0.833	
I would like to respond to messages coming from XYZ to enrich my travel experience	0.476	0.503	
Staying in contact with XYZ can enrich my travel experience	0.888	0.952	
I would like XYZ to communicate with me to serve me better	0.505	0.535	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.801 Total variance explained: 60.942% Bartlett Test of Sphericity: 4846.312 p: 0.000< 0.05			
Note 1: XYZ will be replaced by the airline's name. Note 2: Bold items represent the items retained. Note 3: Cronbach alpha level in bold represents the internal consistency of the six retained items.			

Although all fifteen items were above the suggested threshold levels on factor loadings, their average did not meet 0.70 criterion (Hair et al. 2006). Yet, six of the fifteen items showed considerably high factor loadings, therefore; those six items were tested for reliability.

The reliability analysis of the six items showed a considerable jump in α levels from 0.728 to 0.930. Next, six items with factor loadings ranging from 0.870 to 0.952, with

average loading of 906.167 with reliability level of 0.930 were analyzed qualitatively to make sure, in fact, said six items captured the intended meaning of the construct. Yet before moving on to the qualitative assessment, the variance explained by both versions of the scale were checked. The results showed a significant difference in variance explained by the two versions of the scale in favor of the short version ($R^2_{\text{fifteen items}} = 60.942$ percent, $R^2_{\text{six items}} = 71.142$ percent).

As suggested by Churchill (1999) the short version of the scale was assessed qualitatively once again. The qualitative assessment of the scale ensured the short version captured the essence of the construct, and the six item short version of the scale was accepted. This method was deemed appropriate as Hair et al. (2006, p. 109) argue

The purpose [of EFA] is to retain the nature and character of the original variables, but reduce their number to simplify the subsequent multivariate analysis. Even though the multivariate techniques were developed to accommodate multiple variables, the researcher is always looking for the most parsimonious set of variables to include in the analysis.

As the result of separate EFA analysis run for attitude towards co-creation scale, six items were retained and further analyzed with remaining indicators that made up the output constructs.

EFA for the constructs of perceived values, satisfaction, attitude towards co-creation of value, and future intention to co-produce were performed next. The result of the EFA showed that the items of functional and epistemic values failed to meet communality and factor loading threshold levels. Furthermore, two items from the dimension of future intention to co-produce that had low communality levels were deleted. Final EFA analysis showed KMO level of 0.907 and BTS of 25233.469 ($p = 0.000$). All remaining items had exceptionally high factor loadings, thus average factor loadings, indicating solid convergent validity. The variance explained was again exceptionally high with 78.204 percent. The internal consistency assessment of the final factor solution showed that all dimensions were sufficiently reliable ($\alpha_{\text{SOCVAL}} = 0.954$, $\alpha_{\text{EMOVAL}} = 0.931$, $\alpha_{\text{CONVAL}} = 0.914$, $\alpha_{\text{SATIS}} = 0.898$, $\alpha_{\text{FUTINT}} = 0.927$, $\alpha_{\text{COCREA}} = 0.930$). Table 5.21 summarizes the results for EFA assessment.

Table 5.21: Exploratory factor analysis results for the output variables

Factors and related items	Factor loadings	Cronbach Alpha
Social value		
Using the online check-in helps me feel accepted by others	0.851	0.954
Using the online check-in leaves a good impression on other people	0.841	
Using the online check-in gives me social approval	0.973	
People who use online check-in have more prestige than those who do not	0.951	
Using the online check-in is a status symbol	0.883	
Emotional value		
Using the online check-in makes me feel good	0.642	0.931
Using the online check-in gives me pleasure	0.960	
Using the online check-in makes me happy	0.885	
Convenience value		
I value online check-in because it is quick	0.978	0.914
I value online check-in because it is effortless	0.751	
I value online check-in because it is practical	0.854	
Satisfaction		
I am pleased with the overall check-in experience	0.892	0.898
Using online check-in is a delightful experience	0.626	
I am satisfied with the online check-in experience	0.904	
Future intention to co-produce		
I intend to continue using online check-in on every flight	0.906	0.927
I intend to use self-kiosks of XYZ in the future	0.857	
I intend to make use of different technologies XYZ will provide in the future	0.920	
Attitude towards co-creation of value		
I would like to take advantage of XYZ 's expertise in order to increase the value of my trip	0.778	0.930
I would like to co-create best travel experience with XYZ	0.825	
Staying in contact with XYZ can enrich my travel experience	0.770	
I would like to exchange ideas with XYZ to enrich my travel experience	0.858	
I would like XYZ to support me for me to have a better trip	0.872	
I would like XYZ to present me with different options for me to have a better trip	0.881	
Kaiser-Mayer-Olkin measure of sampling adequacy: 0.907		
Total variance explained: 78.204%		
Bartlett Test of Sphericity: 25233.469 p: 0.000< 0.05		
Note 1: 3 items of Functional value, 3 items of Epistemic value, 2 items from Future intention to co-produce and 9 items from attitude towards co-creation of value with communalities and factor loadings less than 0.50 have been deleted.		
Note 2: Maximum Likelihood method with promax rotation was used.		
Note 3: XYZ will be replaced by the airline's name.		

As discussed through EFA results, the indicators of the output factors had exceptionally high factor loadings ranging 0.626 to 0.978. Average factor loadings for social value, emotional value, convenience value, satisfaction, future intention co-produce and attitude towards co-creation of value were 0.899, 0.829, 0.861, 0.807, 0.894, and 0.831, respectively. The results indicated that the convergent validity for the output variables has been achieved. Table 5.22 summarizes the results for convergent validity for output variables.

Table 5.22: Convergent validity through factor loadings for output variables

Convergent Validity	Factor loadings above 0.50	Average factor loadings
Social value	✓	0.899
Emotional value	✓	0.829
Convenience value	✓	0.861
Satisfaction	✓	0.807
Future intention	✓	0.894
Attitude towards co-creation of value	✓	0.831

Discriminant validity assessment was made through the factor loadings and factor correlations matrix. Since there were no cross loadings between items and the factor correlation matrix did not have any two factors approaching 0.70 level assured discriminant validity. The highest correlation was between social value and attitude towards co-creation of value with 0.661, indicating a shared variance of 43.69 percent, which is still below the threshold level of 50 percent. The reliability levels of all constructs were all above 0.70 limit, ranging from 0.898 to 0.954. Table 5.23 summarizes the results of discriminant validity assessment.

Table 5.23: Discriminant validity through factor correlations matrix for output variables

Factor correlations						
Social value	1.000					
Emotional value	0.324	1.000				
Convenience value	0.243	0.287	1.000			
Satisfaction	0.341	0.281	0.583	1.000		
Future intention	0.349	0.305	0.588	0.627	1.000	
Attitude towards co-creation of value	0.661	0.329	0.434	0.478	0.539	1.000

As a result of the EFA analysis of the main data 31 items were deleted. 22 of the 31 items were deleted due to low communalities or low factor loadings. The remaining 9 co-creation scale items were deleted due to low communalities ranging between 0.412 through 0.506, and to increase R^2 and reliability of the scale.

After EFA was completed, the next step was to perform CFA to test the measurement model in order to advance testing the structural model.

5.4 CONFIRMATORY FACTOR ANALYSIS

Anderson and Gerbing (1988) argue testing for unidimensionality is crucial step in theory testing and development. As single item scales may have numerous disadvantages (Churchill 1979), summated scales are used to understand the responding construct (Gerbing and Anderson 1988). Yet, in order to ensure that the respondents “impute” the same meaning as intended by the researcher, Confirmatory Factor Analysis (CFA) is used built on the early works of Jöreskog and Sörbom (1993), Peter (1981, 1979), and Churchill (1979). Gerbing and Anderson assert (1988, p. 186)

Confirmatory factor analysis affords a stricter interpretation of unidimensionality than can be provided by more traditional methods such as coefficient alpha, item-total correlations, and exploratory factor analysis and thus generally will provide different conclusions about the acceptability of a scale.

This point is the major reason for performing both EFA and CFA to the main data set, in order to eliminate all discrepancies before advancing to testing of the structural model.

While performing CFA, what is actually being tested is (Anderson and Gerbing 1982);

- a. does the theory imposed structure actually exist in the data,
- b. how well are the indicators that form the construct relate to each other (convergent validity),
- c. how well the indicators that converge under one construct, discriminate from other indicators of different constructs (discriminant validity),
- d. how well the indicators fit the overall model theorized (nomological validity).

In order to make true assessment of convergent validity during CFA, this study will report

- i. Squared Multiple Correlations (SMC) in order to assess each indicator's own reliability,
- ii. Construct Reliability (CR) in order to assess the reliability of the construct, and
- iii. Average Variance Extracted (AVE) in order to assess the portion of the variance explained for each factor by its indicators.

Assessment of SMC, CR, and AVE are accepted to be the proof of convergent validity (Hair et al. 2006, Bagozzi et al. 1991, Fornell and Larcker 1981). The threshold levels for SMC, CR and AVE are accepted to be 0.50, 0.70, and 0.50, respectively. Furthermore, when composite reliability is greater than AVE, convergent validity is said to be achieved (Hair et al. 2006).

There are two different approaches in assessing discriminant validity during CFA. The first approach, also known as the less accepted and rigorous one, is fixing the correlation between any two constructs to zero and performing a difference test. The proof of discriminant validity comes through estimation of every construct pair through unconstrained (phi correlations free to vary) and constrained (phi constrained to 1.00) model. As the χ^2 difference show that the constrained model shows a worse fit, discriminant validity is argued to be achieved (Bagozzi and Philips 1982).

The more rigorous approach in assessing discriminant validity during CFA, is comparing the AVE for every construct with the square of the correlation estimates of every other construct (Fornell and Larcker 1981). Through this approach, the researcher ensures that the latent variable explains its indicators better than any other construct of the study by demonstrating that the variance estimates are higher than squared correlation estimates (Hair et al. 2006). Therefore, in order to present discriminant validity, this study seeks to demonstrate greater AVE levels than squared correlations estimates of different constructs. In other words, AVE should always be higher than Maximum Shared Variance (MSV) and Average Shared Variance (ASV) (Hair et al. 2006).

Finally, nomological validity is achieved through goodness-of-fit (GOF) indices explained in section 4.4.6.2. In order to assess nomological validity, this study will use the fit indices of χ^2 , CMIN/*df*, CFI, GFI, AGFI, NFI, TLI, and RMSEA. The general rule of thumb for threshold level of the fit indices mentioned is called “The Magic 0.90” (Hair et al. 2006, p. 751) with the exception of χ^2 , CMIN/*df* and RMSEA. Hair et al. (2006, p. 753) argue for studies where the number of observed variables are more than 30 and sample is larger than 250, significant p-value for χ^2 , values less than 5.0 for CMIN/*df*, and values less than 0.08 for RMSEA is expected.

The common approach in studies with large sample size and observed variables is to follow the route of division made during EFA between different sets of constructs. Similarly, this study will first conduct CFA with the same sets of constructs used for EFA. Yet, once convergent, discriminant, and nomological validity of different subsets of constructs are achieved, it will seek to demonstrate validity for the measurement model as a whole as the researcher argues that the rigorous and strict EFA will help the researcher achieve a good fit for the measurement model (Tabashnick and Fidell 2007).

Furthermore, during CFA analysis the modification indices will be evaluated to improve the model fit of each analysis. Anderson and Gerbing (1982) suggest that studying the modification indices and correlating measurement errors where necessary is an acceptable practice to follow in order to achieve better fitting models.

The first set of factors to perform CFA is customer linked factors, consisting expertise capacity, risk-taking capacity, resource capacity, need for interaction, innovativeness, optimism, and discomfort.

CFA for customer linked factors showed GOF indices above acceptable threshold levels. Although χ^2 statistic was statistically significant indicating poor fit, due to the largeness of the data set, an insignificant χ^2 statistic was never expected. Other GOF indices were $CMIN/df = 3.740$, $RMSEA = 0.05$, $GFI = 0.931$, $NFI = 0.943$, $CFI = 0.957$, $TLI = 0.939$ and $AGFI = 0.913$, all predicting good model fit, hence, demonstrating nomological validity for the items of customer linked factors.

The indicators of convergent validity showed that the items adequately converged under the latent variable imposed. SMC of each item was greater than 0.50, varying between 0.505 through 0.853. CR of each latent variable was well above the threshold level of 0.70, with a minimum CR of 0.816. AVE of the variables were also above the cut-off point of 0.50. Relying on the three indicators discussed, it was concluded that the measurement model had convergent validity.

In order to assess discriminant validity, AVE was compared with ASV and MSV. As each variable's AVE was greater than the average or maximum variance shared with other variables, it was concluded that the variables were discriminant from one other (Hair et al. 2006). Results of the measurement model for customer linked factors are presented in Table 5.24.

Table 5.24: Measurement model results for customer linked factors

Model Fit Indicators	χ^2	df	CMIN/df	RMSEA	GFI	NFI	CFI	TLI	AGFI
	1039.688	278	3.740	0.05	0.931	0.943	0.957	0.939	0.913
Variables					SMC	t-value			
Expertise capacity									
I commonly use technological systems in my daily life					0.564	32.245			
I am capable of using technology					0.825	49.778			
I am confident in my ability to use technology					0.853	50.615			
My previous experience enables me to use technology more efficiently					0.689	39.133			
I am confident in my knowledge on technology					0.749	42.973			
I use variety of technological products and services					0.629	35.668			
Resource capacity									
I have all the necessary technological devices that will make my life easier					0.813	29.886			
I have technological devices that will enable me to access Internet whenever I want					0.738	28.349			
Risk-taking capacity									
I always try to avoid situations involving a risk of getting into trouble					0.505	21.785			
I always play it safe even when it means occasionally losing out on a good opportunity					0.509	22.607			
I am generally a cautious person in my actions					0.812	20.979			
Need for interaction									
Human contact in providing services makes the process enjoyable for me					0.610	23.996			
It bothers me to use a machine when I could talk to a person instead					0.547	22.211			
I like interacting with the person who provides the service					0.809	29.077			
Personal attention by the service employee is important to me					0.583	23.216			
Optimism									
Technology gives me more control over my daily life					0.697	29.605			
Technology gives me more freedom of mobility					0.728	30.752			
Products and services that are the newest technology make my life much more efficient					0.665	29.581			
Innovativeness									
Other people come to me for advice on new technologies					0.656	29.618			
I am among the first in my circle of friends to acquire new technology when it appears					0.622	28.876			
I can keep up with the latest technological developments in my area of interest					0.523	25.829			
Compared to other people, I know a lot more about new technologies					0.755	32.774			
I consider myself an expert on technological products					0.645	29.579			
Discomfort									
I feel intimidated by technology					0.535	24.112			
I feel apprehensive about using technology					0.686	25.646			
I am overwhelmed by how complicated technological systems may be					0.733	25.234			

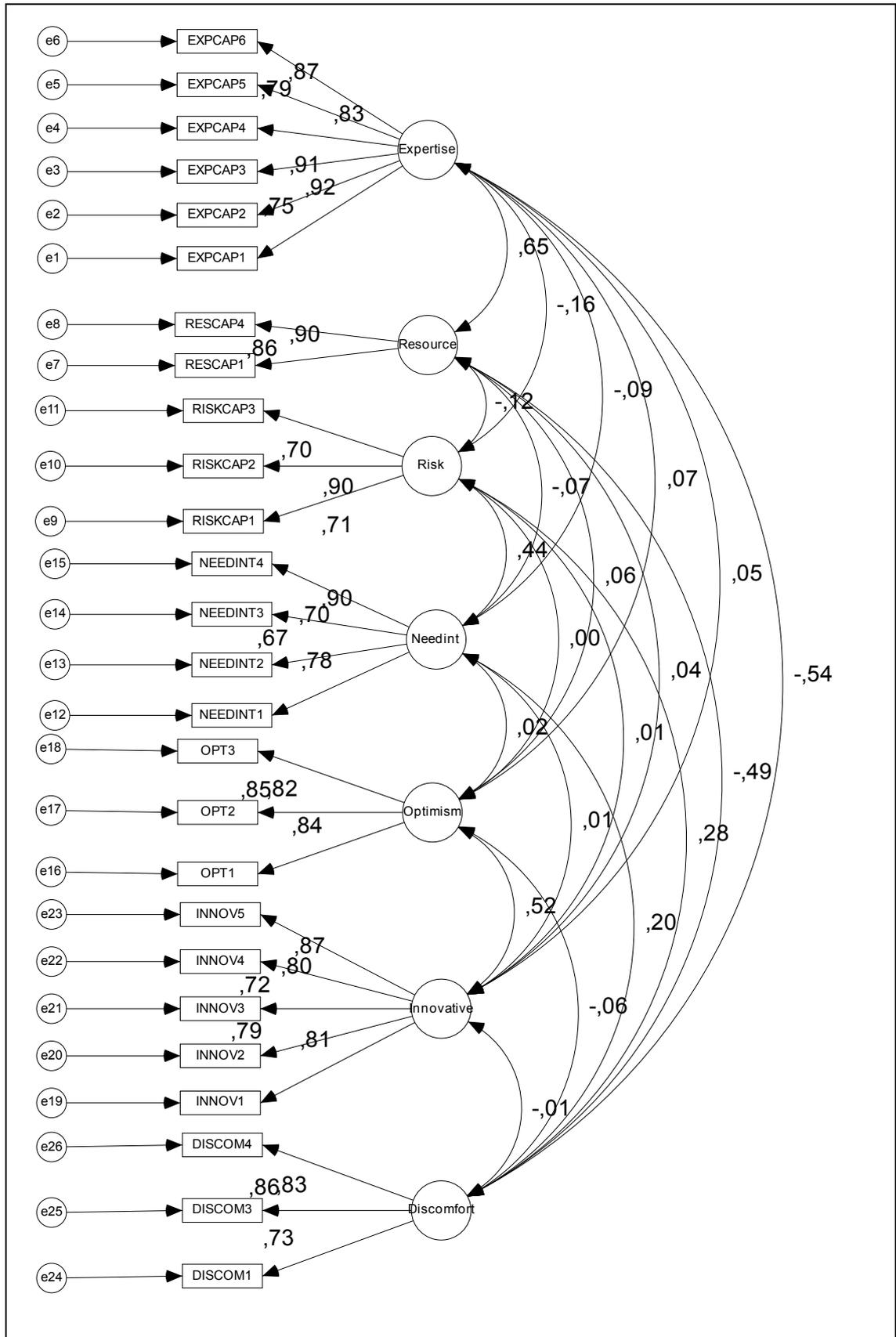
Internal Consistency	Composite Reliability (ρ)				Cronbach Alpha (α)				Average Variance Extracted (AVE)			
Expertise capacity	0.938				0.937				0.718			
Resource capacity	0.873				0.873				0.775			
Risk-taking capacity	0.816				0.808				0.601			
Need for interaction	0.849				0.840				0.588			
Optimism	0.873				0.871				0.696			
Innovativeness	0.899				0.895				0.640			
Discomfort	0.848				0.845				0.651			
	CR	AVE	MSV	ASV								
Innov.	0,899	0,640	0,271	0,046	0,800							
Exp. Cap.	0,938	0,718	0,423	0,126	0,048	0,848						
Res. Cap.	0,873	0,775	0,423	0,115	0,042	0,650	0,880					
Risk Cap.	0,816	0,601	0,197	0,053	0,006	-0,164	-0,123	0,775				
Need int.	0,849	0,588	0,197	0,042	0,006	-0,087	-0,065	0,444	0,767			
Optim.	0,873	0,696	0,271	0,047	0,521	0,067	0,057	-0,003	0,018	0,834		
Discom.	0,848	0,651	0,294	0,110	-0,008	-0,542	-0,493	0,278	0,201	-0,065	0,807	

χ^2 - Chi-square; df - Degrees of freedom; CMIN/df - Chi-square divided by degrees of freedom; RMSEA - Root mean square of approximation; GFI - Goodness-of-fit index; NFI - Normated -fit index; CFI - Comparative-fit index; AGFI - Adjusted goodness-of-fit index; TLI – Tucker – Lewis Index; SMC - Squared multiple correlation

Nomological validity: Satisfied; RMSEA < 0.08, NFI, CFI, GFI, TLI and AGFI => 0.90
Convergent validity: Satisfied; All t-values => 1.96 (sig. at 0.05 level); All SMC => 0.50; All AVE => 0.50; All CR => 0.70; All CR > AVE
Discriminant validity: Satisfied; AVE > MSV and AVE > ASV; see correlation matrix above

Figure 5.7 graphically demonstrates standardized estimates of the measurement model of customer linked factors.

Figure 5.7: Measurement model for customer linked factors



The second set of factor that was assessed through CFA was service linked factors. In the first run, although all GOF indices were above cut-off points, $CMIN/df$ was greater than 5.0. Therefore, modification indices were examined to achieve a lower $CMIN/df$ value. Byrne (2001) explains the necessity of covarying error terms in cases where “there are unique commonalities between items” or due to “redundant content of two items”, which are summarized in modification indices (Hong 2008, p. 86). Once modification indices of the output were studied, it was quickly discovered that the error terms of the construct observability needed to be covaried in order to modify the model. Error terms of two indicators of the construct of observability (Obser2 and Obser3) were covaried as presented in Figure 5.8, and model fit was achieved. Examination of modification indices in order to achieve an acceptable model fit is a common practice, as explained in previous sections (Gaskin 2012).

The fitted model showed very solid GOF indices. Although χ^2 was significant, $CMIN/df = 3.991$, $RMSEA = 0.052$, $GFI = 0.963$, $NFI = 0.975$, $CFI = 0.981$, $TLI = 0.975$, $AGFI = 0.944$ were all above 0.90 threshold level. As a result, it was concluded that nomological validity was achieved for service linked factors.

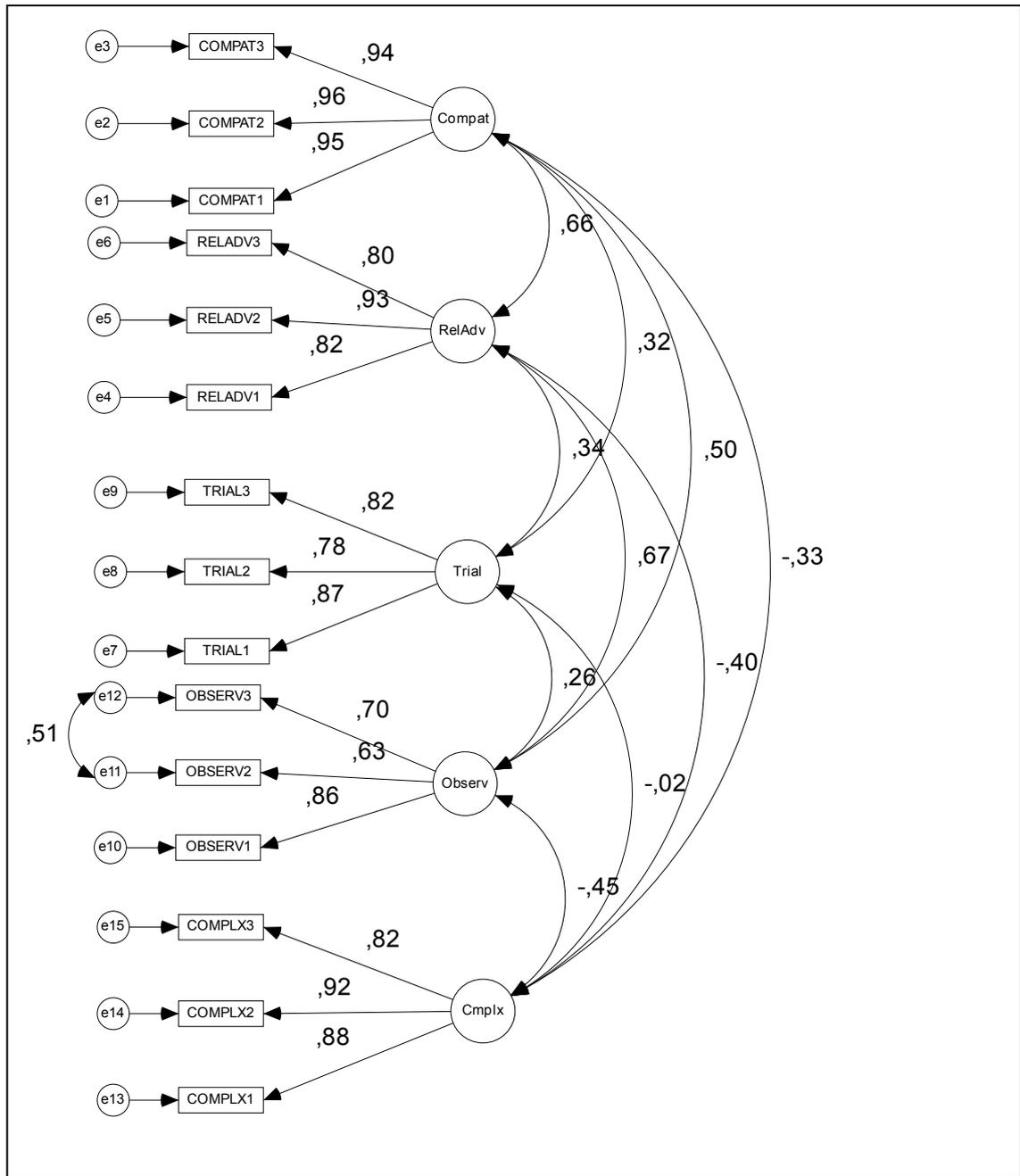
In order to assess convergent validity, CR, AVE and SMC was addressed. Indicators’ own reliabilities (SMCs) were greater than the 0.50 limit, with the exception of a single item from observability. Yet, since the squared multiple correlation of the indicator approached very close to 0.50 ($SMC_{observability2} = 0.498$), the researcher opted against deleting the item. t-values of all items were statistically significant (all t-values >1.96 at sig. = 0.05). Every construct had CR greater than 0.70 as well as AVE greater than 0.50. CR levels of the constructs greater than the AVE were the last indicator needed to conclude to have achieved convergent validity.

Finally, the model was tested for discriminant validity by comparing the levels of AVE with ASV and MSV. In line with suggestions of Hair et al. (2006), it was concluded that AVE levels exceeded levels of ASV and MSV for each construct indicating discriminant validity for service linked factors. Table 5.25 demonstrates final CFA for service linked factors. Figure 5.8 graphically demonstrates standardized estimates of the measurement model of service linked factors.

Table 5.25: Measurement model results for service linked factors

Model Fit Indicators	χ^2	df	CMIN/df	RMSEA	GFI	NFI	CFI	TLI	AGFI
	315.315	79	3.991	0.052	0.963	0.975	0.981	0.975	0.944
Variables							SMC	t-value	
Compatibility									
Using online check-in system is compatible with my lifestyle							0.903	64.565	
Checking myself in online fits well with the way I like to get things done							0.921	70.998	
Using online check-in system is compatible with my needs							0.876	63.897	
Relative advantage									
Using online check-in system improves travelling							0.674	30.998	
Using online check-in system is more advantageous than other methods of checking in							0.867	36.390	
Using online check-in system is the best way to check myself in							0.644	30.576	
Trialability									
I would like the opportunity to try out the online check-in system before using it							0.763	31.118	
If there was any change in the online check-in system, it would be helpful to try out the new system before using it							0.603	27.860	
In case of a change in the online check-in system, it would be good if they would show me how to use the new system							0.666	29.145	
Observability									
The advantages of using the online check-in system is obvious to me and others							0.498	19.435	
I would have no difficulty telling others about the advantages of using the online check-in system							0.743	18.199	
I could communicate to others about the outcomes of using the online check-in system							0.508	17.726	
Complexity									
Online check-in system is cumbersome to use							0.780	35.230	
It is difficult to use the online check-in system							0.845	40.619	
I feel frustrated using the online check-in system							0.674	34.866	
Internal Consistency	Composite Reliability (ρ)		Cronbach Alpha (α)		Average Variance Extracted (AVE)				
Compatibility	0.964		0.964		0.900				
Relative advantage	0.889		0.874		0.728				
Trialability	0.863		0.860		0.678				
Observability	0.778		0.830		0.543				
Complexity	0.907		0.906		0.766				
	CR	AVE	MSV	ASV					
Observability	0.778	0.543	0.442	0.241	0.737				
Compatibility	0.964	0.900	0.441	0.225	0.499	0.949			
Relative adv.	0.889	0.728	0.442	0.291	0.665	0.664	0.853		
Trialability	0.863	0.678	0.117	0.072	0.262	0.319	0.342	0.823	
Complexity	0.907	0.766	0.205	0.119	-0.453	-0.327	-0.404	-0.022	0.875
χ^2 - Chi-square; df - Degrees of freedom; CMIN/df - Chi-square divided by degrees of freedom; RMSEA - Root mean square of approximation; GFI - Goodness-of-fit index; NFI - Normated -fit index; CFI - Comparative-fit index; TLI – Tucker-Lewis index; AGFI - Adjusted goodness-of-fit index; SMC - Squared multiple correlation									
Nomological validity: Satisfied; RMSEA <0.08, NFI, CFI, GFI, TLI and AGFI =>0.90									
Convergent validity: Satisfied; All t-values =>1.96 (sig. at 0.05 level); All SMC =>0.50; All AVE =>0.50; All CR =>0.70; All CR > AVE									
Discriminant validity: Satisfied; AVE > MSV and AVE > ASV; see correlation matrix above									

Figure 5.8: Measurement model for service linked factors



The third assessment was carried out on company linked factors. EFA of company linked factors had resulted in two factor solution of service quality and communication quality as explained in previous section. Therefore, two latent variables were analyzed using CFA.

CFA resulted in poor fit for service linked factors. CMIN/df was greater than 5.0 (CMIN/df= 12.349). Furthermore, CFI, GFI, and NFI values were all below 0.90. The

modification indices were examined to improve the model fit. Four sets of error terms were covaried as the result of analysis. The modifications resulted in good fit of the final measurement model for company linked factors. Although chi-square was significant, all fit indices were on acceptable levels (CMIN/*df* = 4.982, RMSEA = 0.069, GFI = 0.912, NFI = 0.953, CFI = 0.960, TLI = 0.913). The model fit indicators assured nomological validity.

Next, SMCs were examined to assess each items' own reliability. Every item's SMC exceeded the cutoff point of 0.50, and all t-values were greater than 1.96 (sig. 0.05). In order to ensure convergent validity, CR and AVE for each factor were checked. Both service quality and communication quality had CR over 0.90 with AVE over 0.60, which are both well above accepted levels. Furthermore, for both of the constructs CR was greater than AVE, which was considered as the last indicator to be checked to conclude in convergent validity.

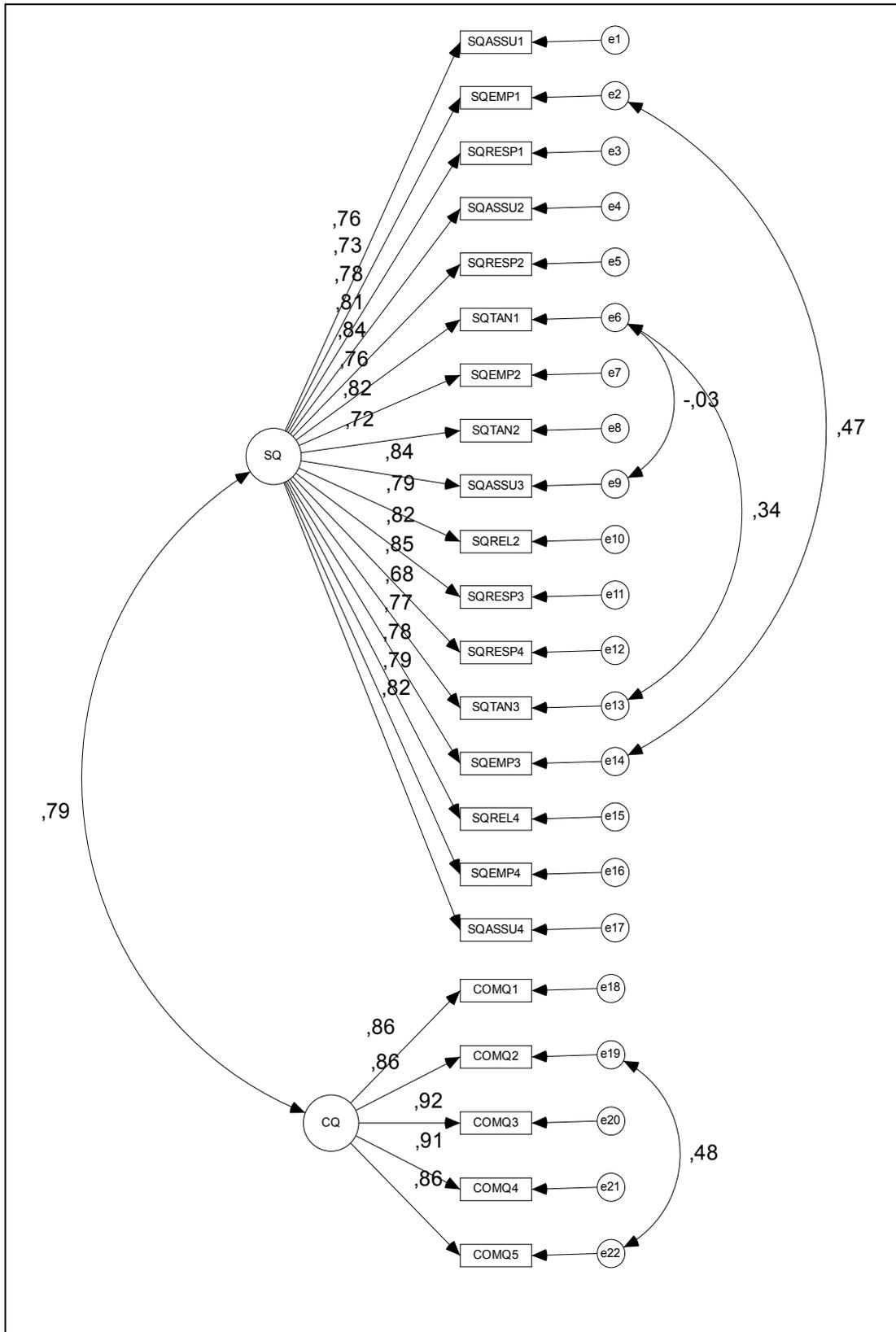
Finally, AVE, AVS and MVS were examined for discriminant validity. As explained previously, higher level of AVE is sought to conclude the latent variable's power to explain more variance than the shared average or shared maximum variance. The assessment of discriminant validity confirmed that AVE was indeed greater than both ASV and MSV, concluding the analysis for discriminant validity.

Table 5.26 demonstrates the analysis for the measurement model. Figure 5.9 is the graphical representation of the measurement model for company linked factors.

Table 5.26: Measurement model results for company linked factors

Model Fit Indicators	χ^2	df	CMIN/df	RMSEA	GFI	NFI	CFI	TLI
	876.893	176	4.982	0.069	0.912	0.953	0.960	0.913
Variables							SMC	t-value
Service quality								
Employees of XYZ are polite							0.567	25.870
Employees of XYZ give me personal attention							0.542	25.510
XYZ tells me exactly when the service will be performed							0.617	27.487
Employees of XYZ are competent in what they do							0.664	32.297
Employees of XYZ respond to my requests promptly							0.697	29.535
XYZ's physical facilities are visually appealing							0.602	26.983
The appearance of the physical facilities of XYZ is in keeping with the type of service provided							0.519	27.778
I feel safe in my transactions with XYZ's employees							0.679	28.999
When I have problems, XYZ is sympathetic and reassuring							0.621	27.567
Employees of XYZ are always willing to help me							0.679	28.921
I receive prompt service from XYZ's employees							0.728	30.248
XYZ has up-to-date equipment							0.508	22.582
XYZ gives me individual attention							0.604	25.922
XYZ provides its services at the time it promises to do so							0.602	27.077
Employees of XYZ know what my needs are							0.633	27.852
I can trust the employees of XYZ							0.657	28.523
Communication quality								
I feel XYZ communicates with me in a timely manner							0.761	39.356
I feel the information provided by XYZ is accurate							0.754	38.492
I feel XYZ provides me all the information that I need to know							0.812	40.935
I feel the information provided by XYZ is adequate							0.774	38.818
I feel the information provided by XYZ is credible							0.798	36.172
Internal Consistency	Composite Reliability (ρ)		Cronbach Alpha (α)		Average Variance Extracted (AVE)			
Service quality	0.965		0.722		0.780			
Communication quality	0.947		0.877		0.631			
	CR	AVE	MSV	ASV				
CQ	0.947	0.780	0.627	0.315	0.883			
SQ	0.965	0.631	0.625	0.318	0.792		0.788	
χ^2 - Chi-square; df - Degrees of freedom; CMIN/df - Chi-square divided by degrees of freedom; RMSEA - Root mean square of approximation; GFI - Goodness-of-fit index; NFI - Normated -fit index; CFI - Comparative-fit index; TLI – Tucker-Lewis index ; AGFI - Adjusted goodness-of-fit index; SMC - Squared multiple correlation								
Nomological validity: Satisfied; RMSEA <0.08, NFI, CFI, GFI, TLI and AGFI =>0.90 Convergent validity: Satisfied; All t-values =>1.96 (sig. at 0.05 level); All SMC =>0.50; All AVE =>0.50; All CR =>0.70; All CR > AVE Discriminant validity: Satisfied; AVE > MSV and AVE > ASV; see correlation matrix above								
Note 1: XYZ will be replaced by the airline's name.								

Figure 5.9: Measurement model for company linked factors



Final leg of antecedents conditions, namely situational factors were assessed next using CFA. EFA of situational factors had showed that the indicators had loaded highly on their expected factors and constructs were highly reliable.

CFA for situational factors were in line with the expectation bred through successful factor solution achieved through EFA. The GOF measures were satisfactory ensuring nomological validity (CMIN/ df = 4.379, GFI = 0.975, NFI = 0.984, CFI = 0.988, TLI = 0.983, AGFI = 0.957, RMSEA = 0.056).

In order to assess convergent validity, each item's own reliability level was checked through SMC. All SMC values were above the cutoff level of 0.50 indicating each indicator in itself was reliable. Furthermore, all t-values were statistically significant at 0.05 level exceeding 1.96. Moreover, AVE explained by each variable was greater than 0.50, and CRs of the constructs exceeded the threshold level of 0.70, ranging between 0.853 through 0.945. Finally, all CR levels were greater than AVEs, which concluded that convergent validity was established.

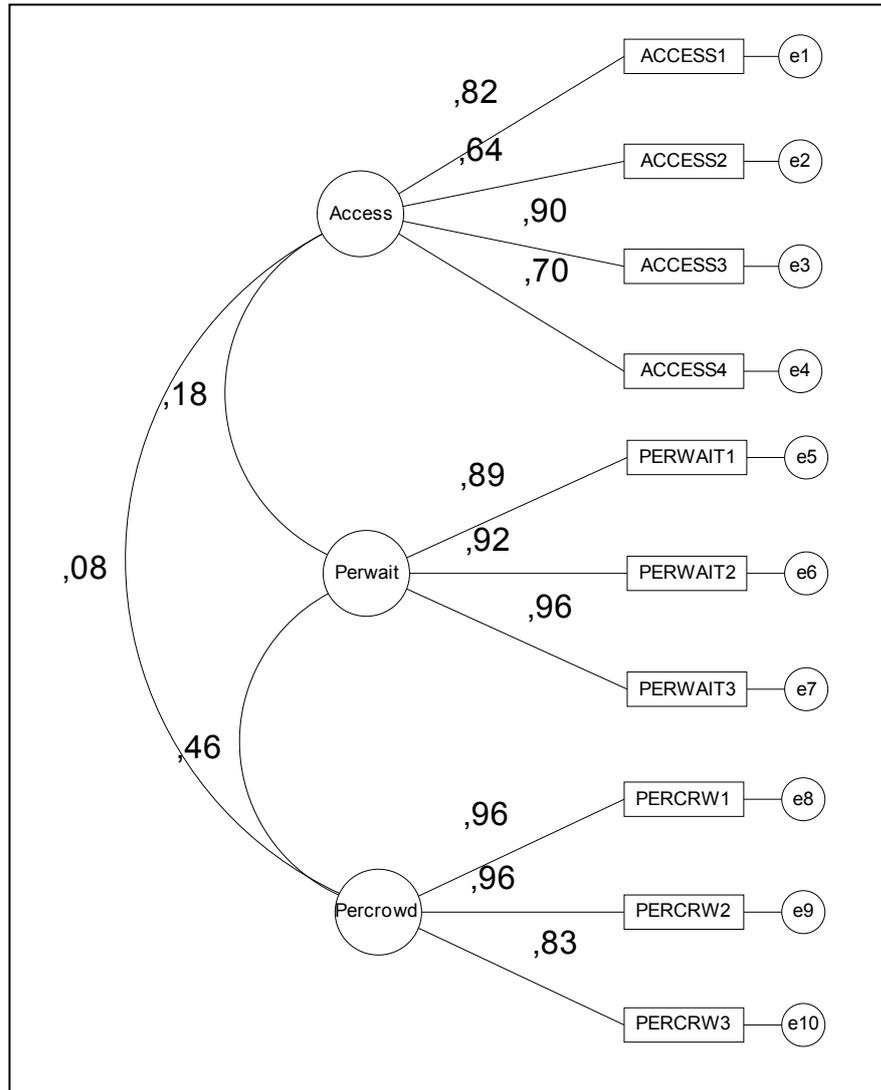
Discriminant validity for situational factors were investigated through comparison of AVE with MSV and ASV. Since AVE for every construct was greater than the maximum and average variance shared with other constructs, it was concluded that in fact all three constructs were discriminant.

Table 5.27 presents the CFA for situational factors. The graphical representation of the measurement model with factor loadings and correlations are presented in Figure 5.10.

Table 5.27: Measurement model results for situational factors

Model Fit Indicators	χ^2	df	CMIN/df	RMSEA	GFI	NFI	CFI	TLI	AGFI
	140.132	32	4.379	0.056	0.975	0.984	0.988	0.983	0.957
Variables							SMC	t-value	
Access convenience									
Online check-in page loads instantly							0.673	26.999	
I can complete online check-in from the comfort of my home or office							0.508	25.895	
Accessing the online check-in page is easy							0.816	31.190	
I can access the online check-in system through every web browser							0.588	26.477	
Perceived crowdedness									
The check-in counters at the airport are too crowded							0.921	47.236	
The check-in counters at the airport are too busy							0.925	47.335	
The airport departure hall is too hectic							0.692	51.363	
Perceived waiting time									
Checking in at the counters takes longer than using online check-in							0.790	52.714	
If I have not already checked in online, I have to spend more time at the airport							0.844	68.380	
Checking in at the counters is the most time consuming way to check-in							0.919	43.747	
Internal Consistency	Composite Reliability (ρ)		Cronbach Alpha (α)		Average Variance Extracted (AVE)				
Access convenience	0.853		0.847		0.596				
Perceived crowdedness	0.943		0.940		0.846				
Perceived waiting time	0.945		0.944		0.852				
	CR	AVE	MSV	ASV					
Perceived waiting	0.945	0.852	0.208	0.120	0.923				
Access convenience	0.853	0.596	0.032	0.019	0.179	0.772			
Perceived crowdedness	0.943	0.846	0.208	0.107	0.456	0.079		0.920	
χ^2 - Chi-square; df - Degrees of freedom; CMIN/df - Chi-square divided by degrees of freedom; RMSEA - Root mean square of approximation; GFI - Goodness-of-fit index; NFI - Normated -fit index; CFI - Comparative-fit index; TLI – Tucker-Lewis index; AGFI - Adjusted goodness-of-fit index; SMC - Squared multiple correlation									
Nomological validity: Satisfied; RMSEA <0.08, NFI, CFI, GFI, TLI and AGFI =>0.90 Convergent validity: Satisfied; All t-values =>1.96 (sig. at 0.05 level); All SMC =>0.50; All AVE =>0.50; All CR =>0.70; All CR > AVE Discriminant validity: Satisfied; AVE > MSV and AVE > ASV; see correlation matrix above									

Figure 5.10: Measurement model for situational factors



Following the path used in EFA, the next step in CFA was to test the measurement model for the moderators. The results of the CFA of the moderators showed that the measurement model had good fit (CMIN/df =3.797, RMSEA =0.051, GFI = 0.988, NFI= 0.993, CFI = 0.995, TLI = 0.992, AGFI = 0.973), which indicated nomological validity.

In order to ensure moderating variables had convergent validity, SMCs, t-values of the indicators, as well as CRs and AVEs were checked. SMCs indicated that all indicators had high reliabilities (SMC >0.50). Similarly, t-values for all indicators were above 1.96, suggesting they were statistically significant at 0.05 level. CR of the constructs

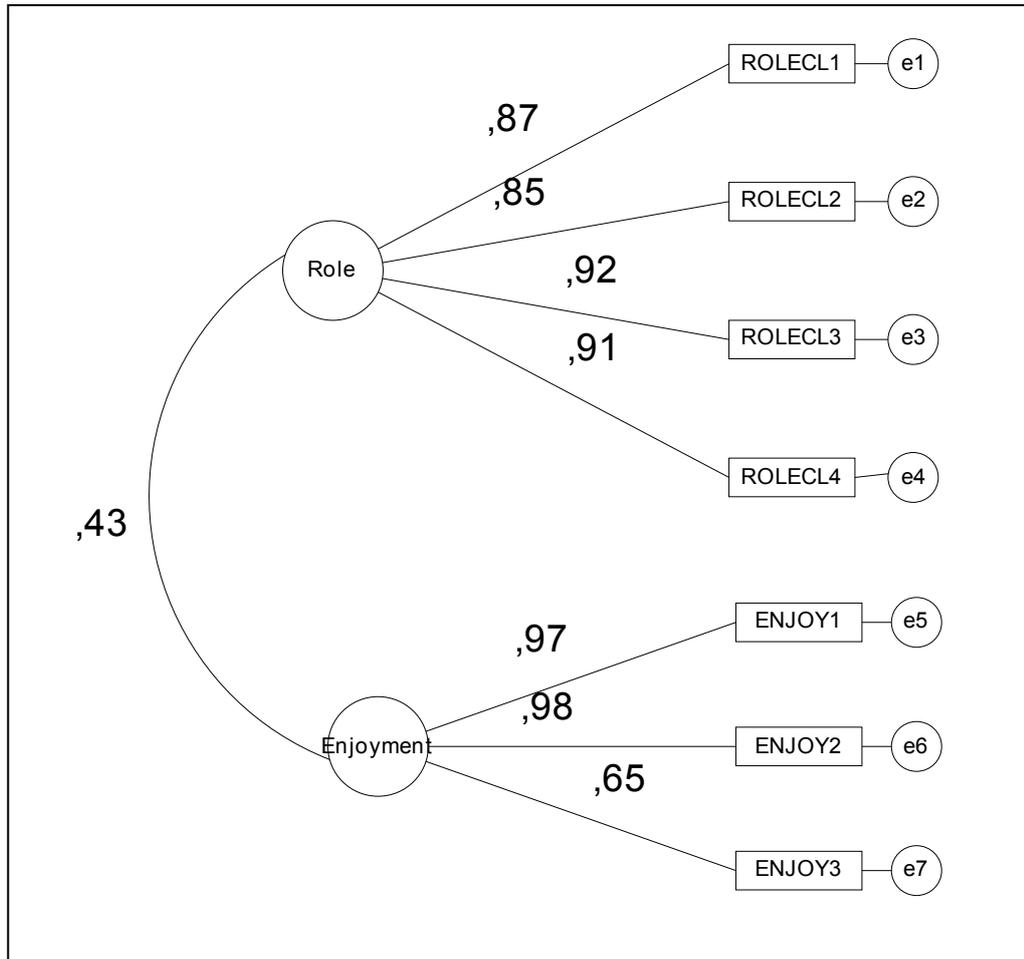
exceeded 0.70 threshold level with exceptionally high reliabilities of 0.937 and 0.909. Furthermore, CRs were higher than AVEs, which were already above 0.50 cutoff point. The analysis ensured that the moderating variables had convergent validity.

Finally, the levels of AVE were compared with MSV and ASV to conclude discriminant validity. All AVEs being higher than MSVs and ASVs, the researcher was able to conclude in discriminant validity. CFA analysis for the moderating variables are shown in Table 5.28. Figure 5.11 graphically demonstrates the measurement model for the moderators.

Table 5.28: Measurement model results for the moderating variables

Model Fit Indicators	χ^2	df	CMI N/df	RMSEA	GFI	NFI	CFI	TLI	AGFI
	49.365	13	3.797	0.051	0.988	0.993	0.995	0.992	0.973
Variables							SMC	t-value	
Role clarity									
I feel certain I can check myself in online successfully							0.749	38.365	
I know what is expected of me when I am checking myself in online							0.722	37.295	
The steps in the process of online check-in are clear to me							0.850	43.596	
I am sure how to use the online check-in system							0.831	42.680	
Enjoyment									
Using the online check-in is fun							0.942	69.851	
Using the online check-in is exciting							0.956	70.794	
Using the online check-in is interesting							0.527	27.366	
Internal Consistency	Composite Reliability (ρ)		Cronbach Alpha (α)		Average Variance Extracted (AVE)				
Role clarity	0.937		0.936		0.789				
Enjoyment	0.909		0.892		0.775				
	CR	AVE	MSV	ASV					
Enjoyment	0.909	0.775	0.189	0.119	0.880				
Role clarity	0.937	0.789	0.219	0.204	0.435			0.888	
χ^2 - Chi-square; df - Degrees of freedom; CMIN/df - Chi-square divided by degrees of freedom; RMSEA - Root mean square of approximation; GFI - Goodness-of-fit index; NFI - Normated -fit index; CFI - Comparative-fit index; TLI – Tucker-Lewis index; AGFI - Adjusted goodness-of-fit index; SMC - Squared multiple correlation									
Nomological validity: Satisfied; RMSEA <0.08, NFI, CFI, GFI, TLI and AGFI =>0.90 Convergent validity: Satisfied; All t-values =>1.96 (sig. at 0.05 level); All SMC =>0.50; All AVE =>0.50; All CR =>0.70; All CR > AVE Discriminant validity: Satisfied; AVE > MSV and AVE > ASV; see correlation matrix above									

Figure 5.11: Measurement model for moderating variables



The next batch of constructs to be evaluated through CFA was motivational and attitudinal constructs, including motivation, intention, and attitude. The first run of the model did not represent a good fit. $CMIN/df$ was 5.16. Although it was slightly over the threshold level of 5.0, modification indices were checked for possible remedies. After a set of error terms of motivation (MOT2 and MOT4) and a set of error terms from attitude (ATT1 and ATT2) were covaried, model fit was achieved. The second run of CFA for the motivation, intention, and attitude ensured nomological validity ($CMIN/df = 4.973$, $RMSEA = 0.067$, $GFI = 0.950$, $NFI = 0.972$, $CFI = 0.975$, $TLI = 0.965$, $AGFI = 0.916$).

Convergent validity for the latent variables were assessed through SMC and t-values of the indicators. Furthermore, AVEs and CRs were inspected to make sure they exceeded the cutoff points.

Discriminant validity assessment was conducted through making sure that the AVE for each latent variable exceeded the maximum shared and average shared variance with other variables.

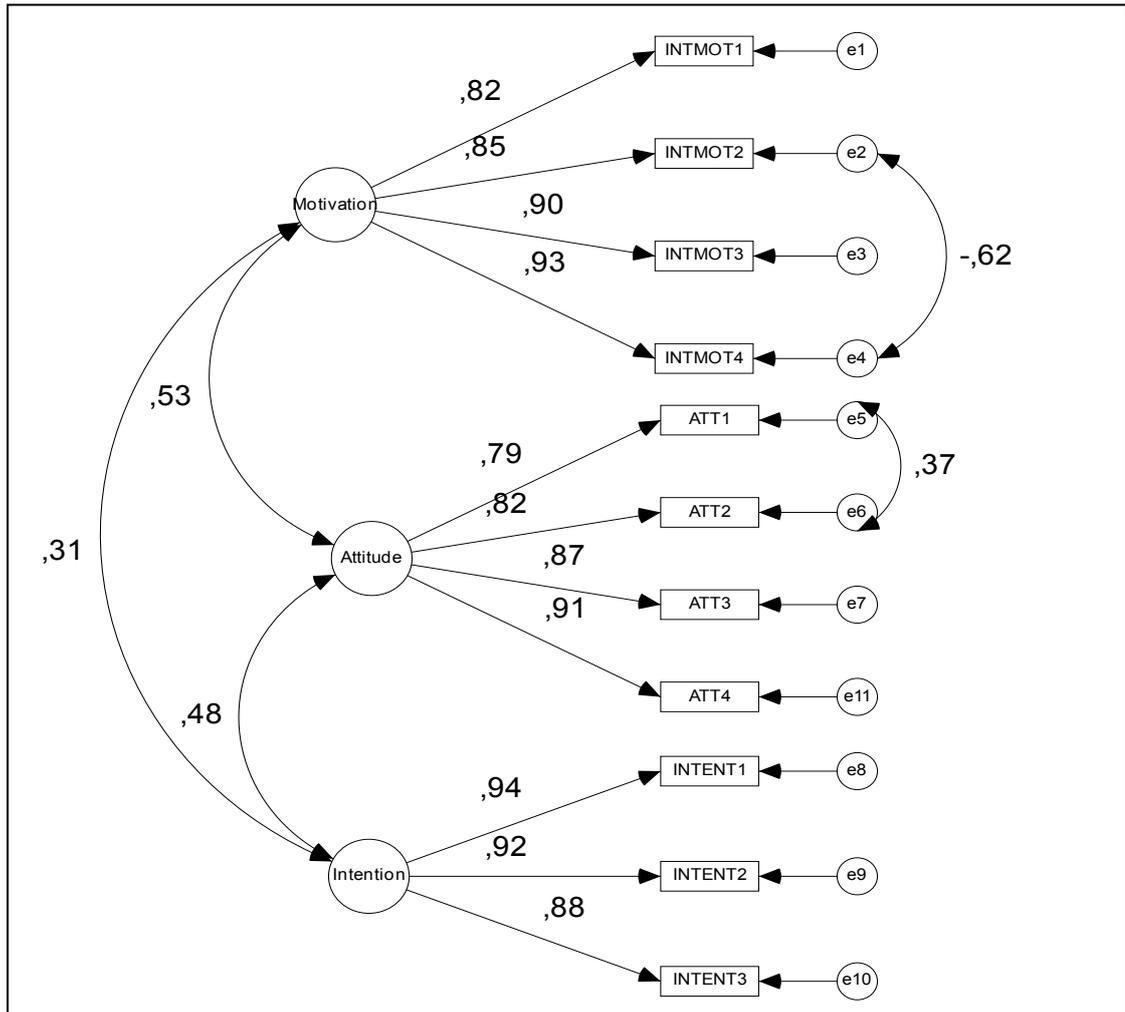
SMCs showed that each indicator was sufficiently reliable since each indicator's SMC exceeded the threshold level of 0.50. T-values were also statistically significant as they were above 1.96 (sig. = 0.05). AVE by each latent variable exceeded 0.50 and CRs of motivation, attitude and intention were 0.929, 0.911 and 0.937, respectively. After comparing the levels of CR with AVE, it was concluded that convergent validity was achieved.

Finally, discriminant validity was assessed through the comparison of AVE with MSV and ASV in order to ensure each latent variable's average variance extracted was greater than those of other variables. It was concluded that the latent variables were discriminant as their indicators explained more variance of their master construct as opposed to other latent variables. CFA results for motivation, attitude and intention is presented in Table 5.29. Measurement model is graphically presented in Figure 5.12.

Table 5.29: Measurement model results for motivation, intention and attitude

Model Fit Indicators	χ^2	df	CMIN/df	RMSEA	GFI	NFI	CFI	TLI	AGFI
	193.959	39	4.973	0.067	0.950	0.972	0.975	0.965	0.916
Variables							SMC	t-value	
Motivation									
Using the online check-in would provide me with personal feelings of accomplishment							0.677	31.565	
Using the online check-in would provide me with feelings of independence							0.730	33.049	
Using the online check-in would allow me to feel innovative in how I interact with a service provider							0.806	38.206	
Using the online check-in would allow me to have increased confidence in my skills							0.856	37.698	
Attitude towards co-production in SSTs									
Using the online check-in is a good idea							0.629	36.958	
I like the idea of using the online check-in							0.665	37.733	
I have a positive attitude toward using the online check-in							0.760	32.156	
Using the online check-in is a wise move							0.885	51.770	
Intention to use SSTs									
I intend to use online check-in next time I travel							0.839	51.896	
I intend to use the online check-in system more frequently in the future							0.775	46.930	
Online check-in will be my first choice next time I travel							0.829	50.233	
Internal Consistency	Composite Reliability (ρ)		Cronbach Alpha (α)		Average Variance Extracted (AVE)				
Motivation	0.929		0.920		0.767				
Attitude	0.911		0.915		0.720				
Intention	0.937		0.936		0.833				
	CR	AVE	MSV	ASV	Attitude	Motivation	Intention		
Attitude	0.911	0.720	0.280	0.257	0.849				
Motivation	0.929	0.767	0.280	0.189	0.529	0.876			
Intention	0.937	0.833	0.233	0.165	0.483	0.312	0.913		
χ^2 - Chi-square; df - Degrees of freedom; CMIN/df - Chi-square divided by degrees of freedom; RMSEA - Root mean square of approximation; GFI - Goodness-of-fit index; NFI - Normated -fit index; CFI - Comparative-fit index; TLI – Tucker – Lewis index; AGFI - Adjusted goodness-of-fit index; SMC - Squared multiple correlation									
Nomological validity: Satisfied; RMSEA <0.08, NFI, CFI, GFI, TLI and AGFI =>0.90 Convergent validity: Satisfied; All t-values =>1.96 (sig. at 0.05 level); All SMC =>0.50; All AVE =>0.50; All CR =>0.70; All CR > AVE Discriminant validity: Satisfied; AVE > MSV and AVE > ASV; see correlation matrix above									

Figure 5.12: Measurement model for motivation, attitude and intention



The last set of latent variables to be analyzed through CFA was labelled as the outputs including perceived social value, perceived emotional value, perceived convenience value, satisfaction, future intention to co-produce, and attitude towards co-creation of value. Yet, following the reasoning explained in EFA section, the researcher questioned her judgment on minimizing the number of indicators for co-creation of value in order to achieve a more parsimonious set of indicators to be used as the newly developed scale. Therefore, CFA for the co-creation scale was run twice with total of 15 items and with total of 6 items that loaded higher on the latent variable, which explained the majority of the variance and contributed to Cronbach alpha level of the said scale.

The first run was done with the whole item set: 15 items in total. On the first run the model showed poor fit. Thus, using modification indices two pairs of measurement

error terms were correlated to achieve a good fit. While this procedure helped with GFI = 0.940, CFI = 0.970, AGFI = 0.904, the $CMIN/df$ and RMSEA levels were unacceptable ($CMIN/df = 6.856$, RMSEA = 0.083). Although it may be argued that good GFI, CFI, and AGFI may be considered sufficient to consider plausibility of the newly developed scale, the short version of the attitude towards co-creation scale made of 6 items that loaded highest in EFA was run next.

The scale with 6 items showed exceptionally good fit. All indicators were well above suggested threshold levels, with high indicator reliabilities. The fit indices $CMIN/df = 3.872$, GFI = 0.992, CFI = 0.996, AGFI = 0.976, NFI = 0.995, TLI = 0.992, RMSEA = 0.051 showed much better fit compared to 15 item long version of the scale. Consequently, as CFA results agreed with the decision made after the EFA, the short version of the scale was included in the CFA with output variables.

First run of CFA for the output variables showed acceptable levels of fit, yet there were 2 sets of measurement errors that were extremely high. After correlating the error terms as suggested by the modification indices, the fit of the model improved significantly. Consequently, two error terms that belonged to the construct of social value (SOCVAL1 and SOCVAL2) as well as two items of the attitude towards co-creation scale (COCREA14 and COCREA15) were covaried. Final CFA assessment for nomological validity was carried out using fit measures. GOF indices showed that the measurement model was nomologically valid with $CMIN/df = 3.803$, GFI = 0.942, CFI = 0.977, AGFI = 0.923, NFI = 0.969, TLI = 0.972, RMSEA = 0.050.

The next step was the assessment of convergent validity through SMC, CR, and AVE. All indicators showed SMCs to be above 0.50 level. CR of the latent variables were above 0.70, ranging between 0.911 through 0.952. Finally, AVE by the constructs were above 0.70, yet still lower than CR ensuring the constructs' convergent validity.

Finally discriminant validity was assessed through comparison of AVE with MSV and ASV. It was concluded that for each latent variable AVE was greater than both MSV and ASV, which is a clear indication of discriminant validity.

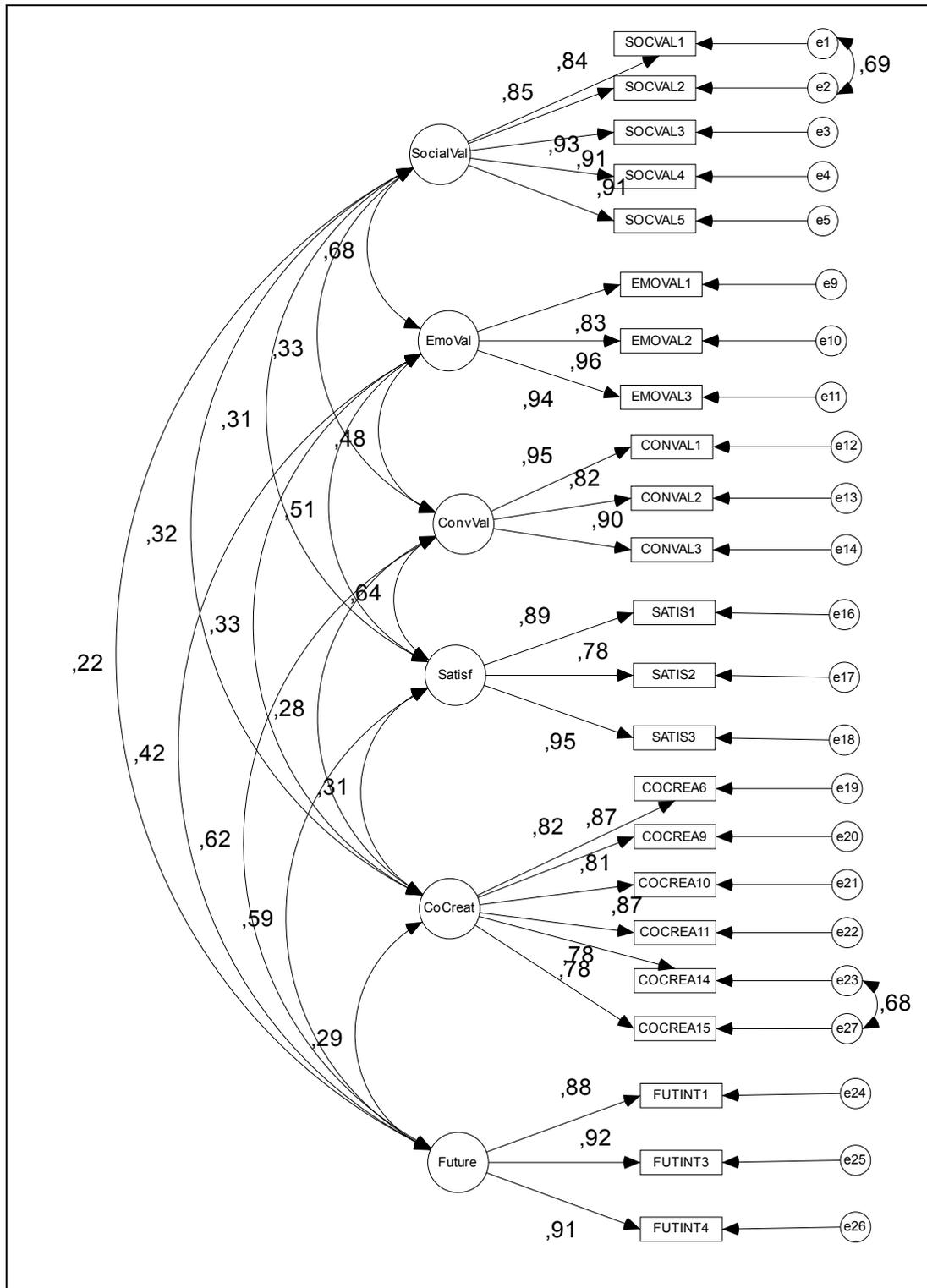
CFA for the output variables are presented in Table 5.30. Figure 5.13 is the graphical demonstration of the measurement model for output variables.

Table 5.30: Measurement model results for output variables

Model Fit Indicators	χ^2	df	CMIN /df	RMSEA	GFI	NFI	CFI	TLI	AGFI	
	790.941	208	3.803	0.050	0.942	0.969	0.977	0.972	0.923	
Variables							SMC	t-value		
Social value										
Using the online check-in helps me feel accepted by others							0.794	64.488		
Using the online check-in leaves a good impression on other people							0.785	63.998		
Using the online check-in gives me social approval							0.867	46.199		
People who use online check-in have more prestige than those who do not							0.786	42.048		
Using the online check-in is a status symbol							0.753	37.209		
Emotional value										
Using the online check-in makes me feel good							0.684	39.562		
Using the online check-in gives me pleasure							0.917	42.426		
Using the online check-in makes me happy							0.885	41.414		
Convenience value										
I value online check-in because it is quick							0.907	54.998		
I value online check-in because it is effortless							0.677	40.236		
I value online check-in because it is practical							0.813	50.013		
Satisfaction										
I am pleased with the overall check-in experience							0.800	42.110		
Using online check-in is a delightful experience							0.613	33.762		
I am satisfied with the online check-in experience							0.908	47.568		
Future intention to co-produce										
I intend to continue using online check-in on every flight							0.767	41.112		
I intend to use self-kiosks of XYZ in the future							0.838	43.229		
I intend to make use of different technologies XYZ will provide in the future							0.826	42.758		
Attitude towards co-creation of value										
I would like to take advantage of XYZ 's expertise in order to increase the value of my trip							0.686	32.115		
I would like to co-create best travel experience with XYZ							0.698	32.441		
Staying in contact with XYZ can enrich my travel experience							0.594	28.783		
I would like to exchange ideas with XYZ to enrich my travel experience							0.787	35.435		
I would like XYZ to support me for me to have a better trip							0.622	29.945		
I would like XYZ to present me with different options for me to have a better trip							0.624	30.118		

Internal Consistency	Composite Reliability (ρ)		Cronbach Alpha (α)				Average Variance Extracted (AVE)			
Social value	0.952		0.954				0.797			
Emotional value	0.935		0.931				0.828			
Convenience value	0.922		0.914				0.798			
Satisfaction	0.911		0.898				0.774			
Future intention to co-produce	0.928		0.927				0.810			
Attitude towards co-creation of value	0.923		0.930				0.668			
	CR	AVE	MSV	ASV						
Social value	0.952	0.797	0.489	0.177	0.893					
Emotional value	0.935	0.828	0.489	0.256	0.699	0.910				
Convenience value	0.922	0.798	0.412	0.245	0.342	0.485	0.894			
Satisfaction	0.911	0.774	0.412	0.247	0.335	0.514	0.642	0.879		
Future intention to co-produce	0.928	0.810	0.379	0.210	0.236	0.421	0.616	0.594	0.900	
Attitude towards co-creation of value	0.923	0.668	0.114	0.096	0.331	0.337	0.284	0.303	0.289	0.818
χ^2 - Chi-square; df - Degrees of freedom; CMIN/df - Chi-square divided by degrees of freedom; RMSEA - Root mean square of approximation; GFI - Goodness-of-fit index; NFI - Normated -fit index; CFI - Comparative-fit index; TLI – Tucker – Lewis index; AGFI - Adjusted goodness-of-fit index; SMC - Squared multiple correlation										
Nomological validity: Satisfied; RMSEA <0.08, NFI, CFI, GFI, TLI and AGFI =>0.90										
Convergent validity: Satisfied; All t-values =>1.96 (sig. at 0.05 level); All SMC =>0.50; All AVE =>0.50										
Discriminant validity: Satisfied; AVE > squared correlation estimates provided in matrix above										
Note 1: XYZ will be replaced by the airline's name.										

Figure 5.13: Measurement model for output variables



As discussed previously after the CFA for different sets of variables were completed individually, the researcher tested the measurement model to ensure validity and reliability of the measurement model as a whole. Although in complex models, CFA is usually conducted in parts and assessed for reliability and validity accordingly, the researcher wanted to demonstrate due diligence before moving on the assessment of the structural model that is based on CFA.

CFA conducted on the entire model showed acceptable levels of fit. The majority of the main fit indices were above the cutoff point, while GFI approached to the threshold level indicating the measurement model could further be tested as a structural model. Nomological validity was achieved through GOF indices ($CMIN/df = 2.594$, $GFI = 0.896$, $CFI = 0.926$, $NFI = 0.901$, $TLI = 0.910$, $RMSEA = 0.038$). GOF indices of the CFA for the entire model is presented in Table 5.31.

Table 5.31: Measurement model GOF indices

Model Fit Indicators	χ^2	df	CMIN/df	RMSEA	GFI	NFI	CFI	TLI
	1522.651	586	2.594	0.038	0.896	0.901	0.926	0.910
χ^2 - Chi-square; df - Degrees of freedom; CMIN/df - Chi-square divided by degrees of freedom; RMSEA - Root mean square of approximation; GFI - Goodness-of-fit index; NFI - Normated -fit index; CFI - Comparative-fit index; TLI – Tucker-Lewis index								
Nomological validity: Satisfied; RMSEA <0.08, NFI, CFI, TLI and AGFI =>0.90 Convergent validity: Satisfied; All t-values =>1.96 (sig. at 0.05 level); All SMC =>0.05; All AVE =>0.50 Discriminant validity: Satisfied; AVE > squared correlation estimates provided through matrix in Table 5.34								

Next, convergent validity was assessed using SMC, CR and AVE. Each indicators' own reliability (SMC) was greater than 0.50, with t-values over 1.96. All latent variables' CRs exceeded 0.70, ranging between 0.817 and 0.965. Furthermore, AVE by the constructs were above the cutoff point of 0.50. Moreover, AVE levels were still lower than CRs, which is accepted to be the final indicator of convergent validity.

CR, AVE, MSV, and ASV levels for the latent variables are reported in Table 5.32.

Table 5.32: Measurement model results for the assessment of convergent validity

	Composite Reliability (ρ)	Average variance extracted (AVE)	Maximum shared variance (MSV)	Average shared variance (ASV)
ATTITUDE TOWARDS COCREATION	0.931	0.691	0.120	0.057
OPTIMISM	0.873	0.696	0.270	0.012
INNOVATIVENESS	0.899	0.640	0.270	0.011
DISCOMFORT	0.848	0.652	0.293	0.064
EXPERTISE CAPACITY	0.938	0.719	0.424	0.095
RESOURCE CAPACITY	0.873	0.775	0.424	0.090
COMPATIBILITY	0.965	0.901	0.442	0.127
TRIALABILITY	0.863	0.678	0.117	0.040
RELATIVE ADVANTAGE	0.889	0.728	0.554	0.168
OBSERVABILITY	0.841	0.638	0.339	0.116
COMPLEXITY	0.908	0.766	0.216	0.081
ROLE CLARITY	0.937	0.788	0.450	0.156
ENJOYMENT	0.910	0.777	0.465	0.143
MOTIVATION	0.922	0.748	0.585	0.126
ATTITUDE TOWARDS CO-PRODUCTION	0.918	0.737	0.350	0.147
SOCIAL VALUE	0.954	0.806	0.497	0.087
EMOTIONAL VALUE	0.935	0.828	0.585	0.141
CONVENIENCE VALUE	0.923	0.800	0.415	0.158
ACCESS CONVENIENCE	0.855	0.600	0.365	0.124
PERCEIVED CROWDEDNESS	0.943	0.846	0.208	0.030
SERVICE QUALITY	0.965	0.622	0.619	0.075
FUTURE INTENTION TO CO-PRODUCE	0.915	0.732	0.554	0.194
PERCEIVED WATING TIME	0.945	0.851	0.208	0.060
NEED FOR INTERACTION	0.849	0.587	0.198	0.017
RISK-TAKING CAPACITY	0.817	0.601	0.198	0.018
COMMUNICATION QUALITY	0.948	0.785	0.619	0.065
SATISFACTION	0.911	0.774	0.415	0.170
INTENTION TO CO-PRODUCE	0.937	0.833	0.496	0.154

In order to assess discriminant validity, AVE by the latent variables were compared with MSV and ASV. It was concluded that the AVE by each latent variable was greater than both MSV and ASV, which indicates discriminant validity. Appendix F.1 demonstrates proof of discriminant validity through comparison of AVE with squared correlation estimates matrix.

In summary, the CFA of the model was carried out in two stages. First, the model was divided parts based on theory. The results of nomological, convergent, discriminant validity and reliability were assessed for each dividend. Next, the measurement model as a whole was assessed. The satisfactory results of the model in parts and as a whole in terms of nomological, convergent, discriminant validity and reliability ensured that measurement model housed statistically and theoretically valid constructs. The next step was the assessment of the structural model using Structural Equation Modelling. Yet, in order to ensure there was no common method bias present, the Harman single-factor test was performed first. The next section explains how the issue of common method variance was addressed.

5.4.1 Common Method Variance

Common method variance (CMV), alternatively named as common method bias, is a concern of any research in which the results are not corroborated using a secondary method (Carr and Kaynak 2007). In such instances, it has been argued that the resulting relationships may be inflated or deflated though the presence of CMV (Siemsen et al. 2010).

Although there are many different ways to control the presence of CMV, each having various advantages and disadvantages, two methods are performed more frequently compared to others (Sharma et al. 2009). The two methods which are argued to have advantages, over competing ones, are Harman's single-factor test and the marker variable technique (Sharma et al. 2009).

This study uses Harman's single-factor test to assess the presence of CMV. Harman's single factor test is basically an unrotated factor analysis performed on all of the variables. The idea behind Harman single-factor test is that emergence of a single general factor explaining majority of the variance is the indicator of CMV (Podsakoff et

al. 2003); therefore, any single factor explaining less than 50 percent of the variance indicates the study is free from common method bias.

The result of the unrotated factor analysis confirmed that a single factor explained 23.30 percent of the variance, thus confirming the data lacked presence of CMV.

The results of the analysis thus far have demonstrated that measurement models were ready to be tested as a structural model. The next section explains the structural model testing.

5.5 STRUCTURAL MODEL TESTING

Once the latent constructs of the measurement model is found to be valid and reliable, the next step is to test the structural model in terms of the relationships among the constructs theorized (Hair et al. 2006). As stated earlier, it is only through structural model testing, the researcher is able to make conclusions on the causal links between the latent constructs. Structural model testing is the assessment of the nature and magnitude of the relationships between theorized latent variables. This process is carried out by the assessment of the structural model fit through various means (Hair et al. 2006).

This study utilizes Analysis of MOment Structures (AMOS) for structural model testing. As it is the case with all multivariate techniques, certain multivariate assumptions must be tested and reported before advancing to testing of the structural model. The next sections will concentrate on the analysis of multivariate assumptions.

5.5.1 Testing for Multivariate Assumptions

Test of linearity and multicollinerity are explained and investigated in the next section to ensure that that the measurement model can be tested using structural equation modelling.

5.5.1.1 Linearity

The first assessment of multivariate assumptions is the test of linearity since AMOS only tests linear relationships (Gaskin 2012). Linearity is the proof of relationship between the dependent and independent variables showing the association between

them (Hair et al. 2006). In other words, as Tabachnick and Fidell (2007, p. 83) express multivariate techniques assume “there is a straight-line relationship between two variables”. Linearity is important because it is directly linked to Pearson’s r , which is the indicator of the amount of relationship between variables. Yet, in practical sense, not all relationships are linear, and this needs to be reported as the limitation of the study before moving on the structural model testing.

In order to test linearity, every independent variable is tested with the dependent variable it predicts for each possible relationship. The significance level of the F statistic (sig. < 0.05) assert that the relationship between independent variable and the dependent variable. In cases where the F statistic for linear relationship is greater than all other forms of relationships that the two variables may have, the relationship concluded to be linear. Conversely, when the F statistic for other forms of relationship-logarithmic, inverse, quadratic, cubic, compound, logistic, growth, and exponential is greater than the F statistic of the linear path, and when the linear path’s F statistic is insignificant, the relationship is granted with the highest F valued relationship (Gaskin 2012).

Table 5.33 summarizes the results of the test of linearity. The results indicate that from 28 relationship tested, the relationship between discomfort and motivation, as well as behavior and emotional value were quadric. While the relationships between optimism and motivation, as well as access convenience and motivation were cubic, the relationship between need for interaction and motivation were inverse. The remaining 22 relationships were linear, while the relationship between behavior and social value being sufficiently linear.

The results confirmed that the curve estimation for the 23 relationships were linear or sufficiently linear to be tested in covariance based structural equation modelling algorithm such as the one used in AMOS. Five paths that were found to be quadric, cubic and inverse are reported as a limitation, given the paths are found insignificant.

Table 5.33: Test of linearity

Equation		Model Summary			Result
Independent variable	Dependent variable	R Square	F	Sig.	
Expertise capacity	Motivation	0.025	27.625	0.000	Linear
Resource capacity	Motivation	0.035	39.790	0.000	Linear
Risk taking capacity	Motivation	0.010	11.183	0.001	Linear
Need for interaction	Motivation	0.003	3.558	0.044	Inverse
Innovativeness	Motivation	0.004	4.173	0.041	Linear
Optimism	Motivation	0.001	0.663	0.616	Cubic
Discomfort	Motivation	0.011	6.061	0.002	Quadratic
Compatibility	Motivation	0.076	89.737	0.000	Linear
Relative advantage	Motivation	0.126	157.849	0.000	Linear
Trialability	Motivation	0.089	106.831	0.000	Linear
Observability	Motivation	0.162	210.610	0.000	Linear
Complexity	Motivation	0.042	48.499	0.000	Linear
Service quality	Motivation	0.119	147.246	0.000	Linear
Communication quality	Motivation	0.109	133.903	0.000	Linear
Perceived crowdedness	Motivation	0.142	180.917	0.000	Linear
Access convenience	Motivation	0.016	6.080	0.000	Cubic
Perceived waiting time	Motivation	0.014	15.786	0.000	Linear
Motivation	Attitude	0.356	603.309	0.000	Linear
Attitude	Intention	0.247	358.867	0.000	Linear
Intention	Behavior	0.010	10.298	0.001	Linear
Behavior	Social value	0.007	7.888	0.005	Sufficiently linear
Behavior	Convenience value	0.012	12.787	0.001	Linear
Behavior	Emotional value	0.004	1.185	0.668	Quadratic
Social value	Satisfaction	0.132	166.295	0.000	Linear
Emotional value	Satisfaction	0.294	434.854	0.000	Linear
Convenience value	Satisfaction	0.463	940.600	0.000	Linear
Satisfaction	Future intention	0.415	776.429	0.000	Linear
Satisfaction	Attitude towards co-creation of value	0.103	124.84	0.000	Linear

5.5.1.2 Multicollinearity

Second set of tests to be applied to ensure multivariate assumptions is the test for multicollinearity.

The assessment of multicollinearity is carried out in two stages as, there are two levels of independent variables predicting a dependent variable. The first assessment is carried out on independent variables predicting the dependent variable of motivation. The results of multicollinearity diagnostics are presented in Table 5.34.

The results of the multicollinearity assessment show that there is no multicollinearity for the first set of indicators as the tolerance values are way below the cutoff point of 0.90 and the variance inflation factors (VIF) are less than 10.

Table 5.34: Multicollinearity diagnostics for independent variables predicting the dependent variable of motivation

Model	Collinearity Statistics	
	Tolerance	VIF
EXPERTISE CAPACITY	0.405	2.468
RESOURCE CAPACITY	0.437	2.288
RISK-TAKING CAPACITY	0.821	1.217
OPTIMISM	0.651	1.537
INNOVATIVENESS	0.656	1.524
DISCOMFORT	0.475	2.104
COMPATABILITY	0.437	2.286
RELATIVE ADVANTAGE	0.319	3.138
TRIALABILITY	0.730	1.369
COMPLEXITY	0.592	1.690
OBSERVABILITY	0.481	2.079
SERVICE QUALITY	0.315	3.178
COMMUNICATION QUALITY	0.310	3.227
ACCESS CONVENIENCE	0.583	1.715
PERCEIVED CROWDEDNESS	0.749	1.335
PERCEIVED WAITING TIME	0.653	1.531

Dependent variable: Motivation

The second stage in multicollinearity assessment is carried out for predictors of satisfaction, which are social, emotional, and convenience value. As these predictors are, again, at the same level theoretically predicting a single dependent variable (satisfaction), a different set of assessment was carried out. Table 5.35 summarizes the

multicollinearity diagnostics of the second stage. As presented in Table 5.35, the second stage of multicollinearity assessment showed no issues of multicollinearity between predictors of satisfaction. All tolerance values were below the threshold level of 0.90 and VIFs were less than 10.

Table 5.35: Multicollinearity diagnostics for independent variables predicting the dependent variable of satisfaction

Model	Collinearity Statistics	
	Tolerance	VIF
CONVENIENCE VALUE	0.741	1.349
EMOTIONAL VALUE	0.396	2.528
SOCIALVALUE	0.462	2.164

Dependent Variable: Satisfaction

Once the assumptions of linearity and multicollinearity have been tested, the analysis of the results continued with assessing model fit.

5.5.2 Assessing Model Fit

Once necessary evaluations regarding individual latent variables validity and reliability, as well as testing of multivariate assumptions were complete, the next step was to test the structural model to conclude on the causal links hypothesized.

In order to test the structural paths, the overall fit of the model needs to be assessed to conclude whether the model is valid (Hair et al. 2006), and GOF indices are used to assess the model fit. Table 5.36 demonstrates the GOF indices for the research model.

The first assessment is to check for the statistical significance of the χ^2 value. Although, χ^2 was statistically significant ($\chi^2 = 955.470$, $df = 220$) at the 0.05 significance level, indicating poor fit, as explained in earlier sections, it is almost never possible to get a statistically insignificant χ^2 value with large samples (Bagozzi et al. 1991). This is the reason why other fit indices are examined to assess the model fit (Hair et al. 2006).

The fit indices introduced in the earlier sections were examined to assess whether the model adequately represented the relationships proposed by the researcher. $CMIN/df$ was 4.343 below the cutoff point of 5.0. Other absolute and incremental fit indices exceeded the cutoff point of 0.90 as suggested by Hair et al. (2006). NFI, CFI, GFI,

AGFI and TLI were 0.928, 0.943, 0.943, 0.902 and 0.909 respectively. Hair et al. (2006) argue for RMSEA value below 0.08 is sought for samples over 250. The RMSEA value of the model was calculated as 0.055, which was below the 0.08 level.

The GOF indices indicated that the overall fit of the model was valid and the model could be further tested for the hypothesized relationships. Table 5.36 demonstrates the model fit indicators for the structural model.

Table 5.36: Model fit indicators for the structural model

Model Fit Indicators	χ^2	df	CMIN/df	RMSEA	GFI	NFI	CFI	AGFI	TLI
	955.470	220	4.343	0.055	0.943	0.928	0.943	0.902	0.909
χ^2 - Chi-square; df - Degrees of freedom; CMIN/df - Chi-square divided by degrees of freedom; RMSEA - Root mean square of approximation; GFI - Goodness-of-fit index; NFI - Normated -fit index; CFI - Comparative-fit index; AGFI - Adjusted goodness-of-fit index; SMC - Squared multiple correlation; TLI - Tucker-Lewis index									
Model fit achieved: CMIN/df <0.5; RMSEA <0.08; NFI, CFI, GFI, AGFI, TLI =>0.90									

Next, the hypothesized relationships were tested using structural equation modelling. Although the model was tested as a whole, since it is extremely complex model to be presented in a single figure, the graphical demonstration of the hypothesis testing is divided between Figures 5.14, 5.15, 5.18 and 5.23. Standardized estimates of the paths, t-values at 0.05 significance level and variances explained are demonstrated in graphical representations.

The results showed 11 of the 17 paths tested in relation to co-production motivation were significant. Seven of the initial relationships proposed belonged to customer linked factors. These factors were expertise capacity (EXPCAP), risk-taking capacity (RISK), resource capacity (RESCAP), need for interaction (NEED), innovativeness (INNOV), optimism (OPTIM), and discomfort (DISCOM). The assessment of standardized estimates and critical values for these seven paths concluded that five of the paths were statistically significant. Four of the critical ratios were above 1.96 at the 0.95 confidence level and one of the five critical ratios was above 1.282 at the 0.90 confidence level.

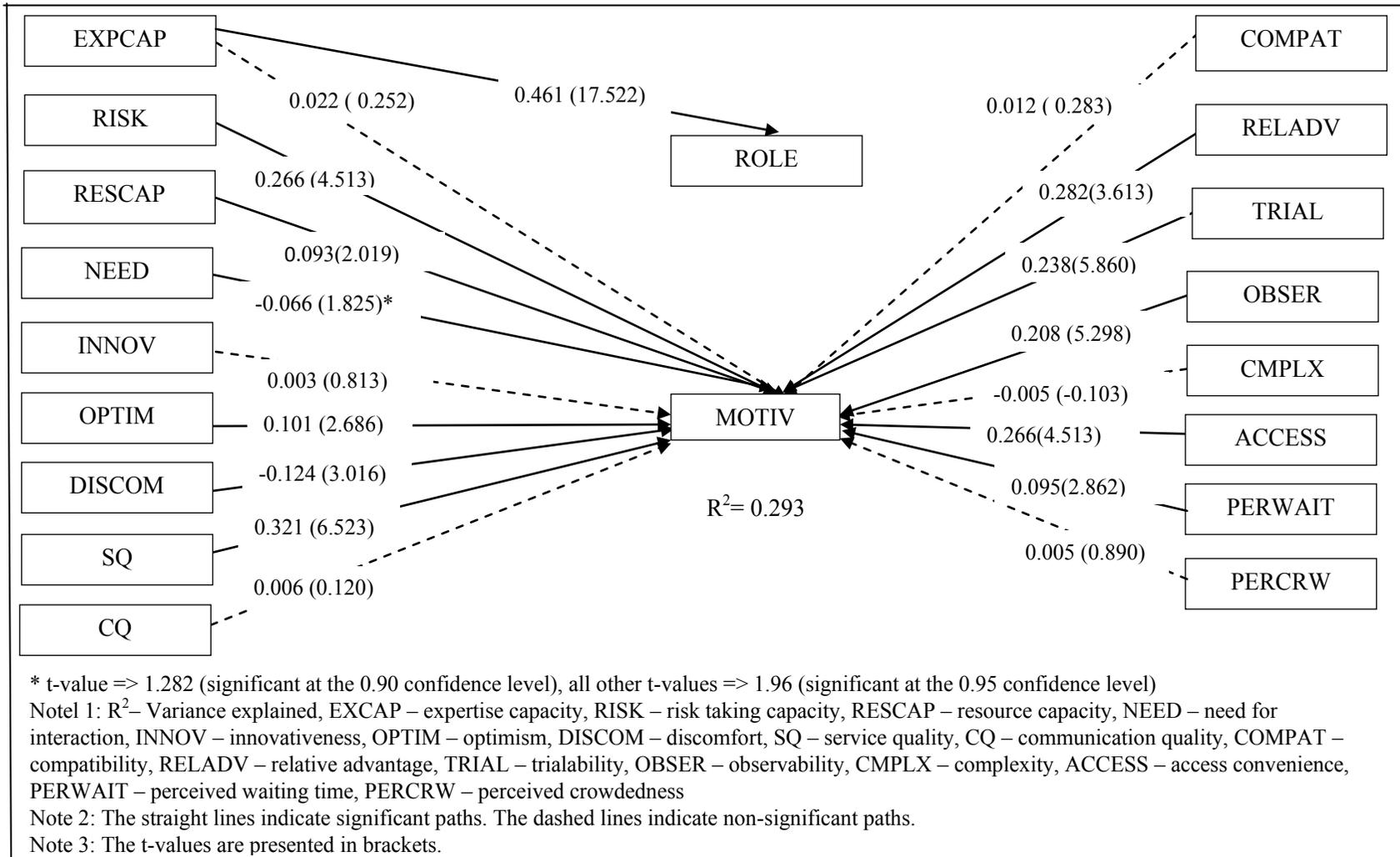


Figure 5.14: The structural model, standardized regression weights, t-values and variance explained of antecedent conditions and motivation

Regarding direct relationships between customer linked factors and co-production motivation, risk-taking capacity was found to be a predictor of co-production motivation ($\gamma_{\text{RISK}} = 0.266$, $t_{\text{RISK}} = 4.513$, $p < 0.05$), supporting H3. Similarly, assessment of the direct relationships between resource capacity (RESCAP) as well as optimism (OPTIM) and co-production motivation (MOTIV) were statistically significant ($\gamma_{\text{RESCAP}} = 0.093$, $t_{\text{RESCAP}} = 2.019$, $p < 0.05$) and ($\gamma_{\text{OPTIM}} = 0.101$, $t_{\text{OPTIM}} = 2.686$, $p < 0.05$). These results supported H4 and H7. The results showed negative relationships between need for interaction (NEED) and co-production motivation (MOTIV) as well as discomfort (DISCOM) and co-production motivation (MOTIV) as hypothesized. The relationship between need for interaction (NEED) and co-production motivation was statistically significant ($\gamma_{\text{NEED}} = -0.066$, $t_{\text{NEED}} = 1.825$, $p < 0.10$), supporting H5. H8 was also supported as the direct effect of discomfort (DISCOM) on co-production motivation (MOTIV) was found to be statistically significant at the 0.95 confidence level ($\gamma_{\text{DISCOM}} = -0.124$, $t_{\text{DISCOM}} = 3.016$, $p < 0.05$). Two of the direct effects between customer linked factors were not confirmed. The hypothesized paths between expertise capacity (EXPCAP) and co-production motivation (MOTIV) as well as innovativeness (INNOV) and co-production motivation (MOTIV) was not significant ($\gamma_{\text{EXPCAP}} = 0.022$, $t_{\text{EXPCAP}} = 0.252$, $p < 0.05$; $\gamma_{\text{INNOV}} = 0.003$, $t_{\text{INNOV}} = 0.813$, $p < 0.05$). Thus, H1 and H6 were not supported.

The second set of co-production predictors labelled as service linked factors included compatibility (COMPAT), relative advantage (RELADV), trialability (TRIAL), observability (OBSER) and complexity (CMPLX). Out of the five paths hypothesized regarding service linked factors and co-production motivation, three were found to be statistically significant. Relative advantage (RELADV), trialability (TRIAL), and observability (OBSER) predicted co-production motivation at the 0.95 confidence level ($\gamma_{\text{RELADV}} = 0.282$, $t_{\text{RELADV}} = 3.613$, $p < 0.05$; $\gamma_{\text{TRIAL}} = 0.238$, $t_{\text{TRIAL}} = 5.860$, $p < 0.05$; $\gamma_{\text{OBSER}} = 0.208$, $t_{\text{OBSER}} = 5.298$, $p < 0.05$). Thus, H11, H13 and H14 were supported. However, no direct causal link was found between compatibility (COMPAT) and co-production motivation (MOTIV) ($\gamma_{\text{COMPAT}} = 0.012$, $t_{\text{COMPAT}} = 0.283$, $p < 0.05$). Thus, H10 was not supported. Similarly, the direct path between complexity (CMPLX) and co-production motivation was not supported (H12), as critical ratio of the direct path was below the

critical ratio of 1.96 at 0.95 significance level ($\gamma_{\text{CMPLX}} = -0.005$, $t_{\text{CMPLX}} = -0.103$, $p < 0.05$).

Two antecedent conditions regarding company linked factors were service quality (SQ) and communication quality (CQ). The results showed that while SQ successfully predicted co-production motivation (MOTIV), but there was no direct causal link between CQ and co-production motivation (MOTIV). H16 arguing the relationship between service quality (SQ) and co-production motivation (MOTIV) was supported, as the direct causal path was significant at the 0.95 confidence level ($\gamma_{\text{SQ}} = 0.321$, $t_{\text{SQ}} = 6.523$, $p < 0.05$). The influence of communication quality (CQ) on co-production motivation (MOTIV) was not confirmed, resulting in failing to support H15 ($\gamma_{\text{CQ}} = 0.006$, $t_{\text{CQ}} = 0.120$, $p < 0.05$).

Final leg of antecedent conditions were situational factors. The direct relationships between access convenience (ACCESS) and co-production motivation (MOTIV) as well as perceived waiting time (PERWAIT) and co-production motivation (MOTIV) were significant at the 0.95 confidence level ($\gamma_{\text{ACCESS}} = 0.266$, $t_{\text{ACCESS}} = 4.513$, $p < 0.05$; $\gamma_{\text{PERWAIT}} = 0.095$, $t_{\text{PERWAIT}} = 2.862$, $p < 0.05$). Thus, H17 and H18 were supported. Among the situational factors, the only causal relationship, that was not statistically significant, was between perceived crowdedness (PERCRW) and co-production motivation (MOTIV), resulting not supporting H19 ($\gamma_{\text{PERCRW}} = 0.005$, $t_{\text{PERCRW}} = 0.890$, $p < 0.05$).

Although the direct effect of expertise capacity (EXPCAP) on co-production motivation (MOTIV) was found to be insignificant ($\gamma_{\text{EXPCAP}} = 0.022$, $t_{\text{EXPCAP}} = 0.252$, $p < 0.05$), the hypothesized relationship between expertise capacity (EXPCAP) and role clarity (ROLE) was statistically significant at the 0.95 confidence level ($\gamma_{\text{EXPCAP}} = 0.461$, $t_{\text{EXPCAP}} = 17.522$, $p < 0.05$). Therefore, H2 was supported.

The antecedent conditions proposed explained over 29 percent of the variance of co-production motivation ($R^2_{\text{MOTIV}} = 0.293$).

Once the direct effects between antecedent conditions and co-production motivation (MOTIV) were established, the next step was to test for interaction effects of moderating variables role clarity (ROLE) and enjoyment (ENJOY). Figure 5.15 is the

graphical representation of role clarity's interaction effect on the relationships between antecedent conditions and co-production motivation.

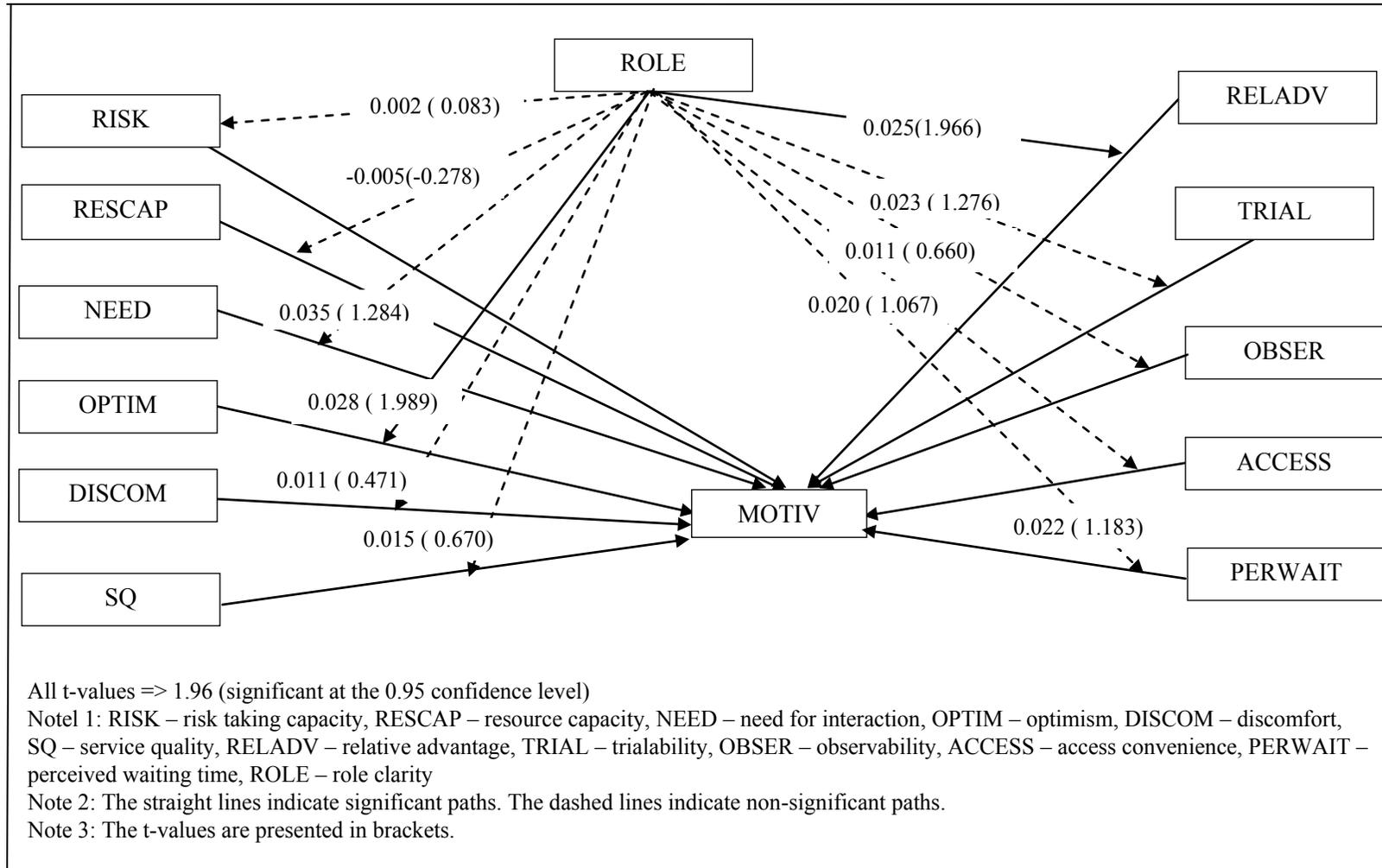
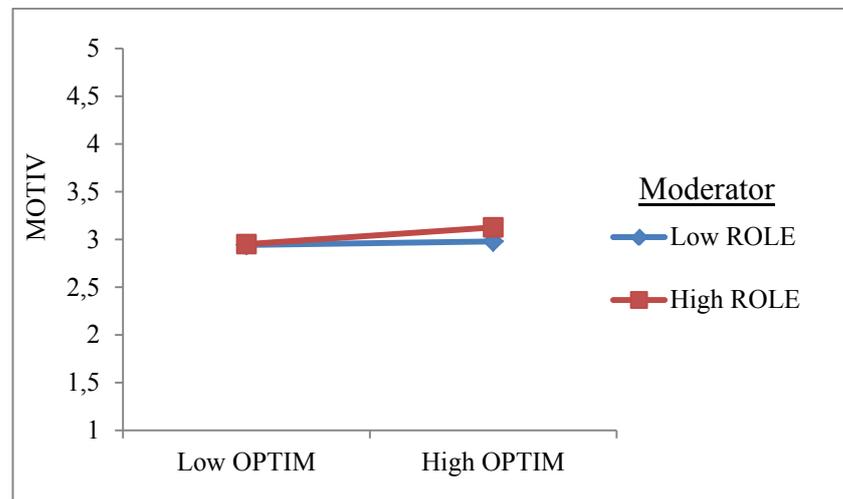


Figure 5.15: Interaction effect of moderating variable role clarity on antecedent conditions and co-production motivation

Regarding role clarity, two of the paths regarding interaction effects were found to be significant at the 0.95 confidence level. The main effect of optimism (OPTIM) on co-production motivation (MOTIV) is moderated by role clarity (ROLE) ($\beta = 0.028$, $t = 1.989$, $p < 0.05$), supporting H20f. Similarly, direct effect of relative advantage (RELADV) of the service to be co-produced on co-production motivation (MOTIV) was moderated by role clarity (ROLE) ($\beta = 0.025$, $t = 1.966$) supporting H20j. Next, the moderation effect of role clarity (ROLE) was plotted for the significant paths to assess the direction of the interaction effect. Figures 5.16 and 5.17 represents the plots for the significant interaction effects.

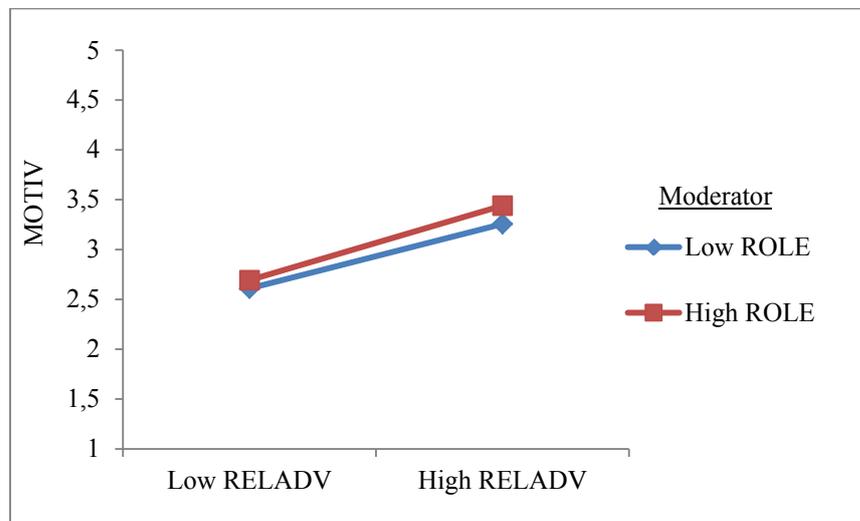
Figure 5.16: Interaction effect of role clarity on the relationship between optimism and co-production motivation



Note: MOTIV – Co-production motivation; OPTIM – Optimism; ROLE – Role clarity

As presented in Figure 5.16, role clarity (ROLE) strengthens the positive relationship between optimism (OPTIM) and co-production motivation (MOTIV) (H20f supported). Thus, for low role clarity (ROLE) the effect of the moderator is not strong. Yet, as high role clarity enters the relationship between optimism and co-production motivation, there is a positive slope. Therefore, optimism (OPTIM) has stronger effect on co-production motivation (MOTIV) when there is high role clarity (ROLE).

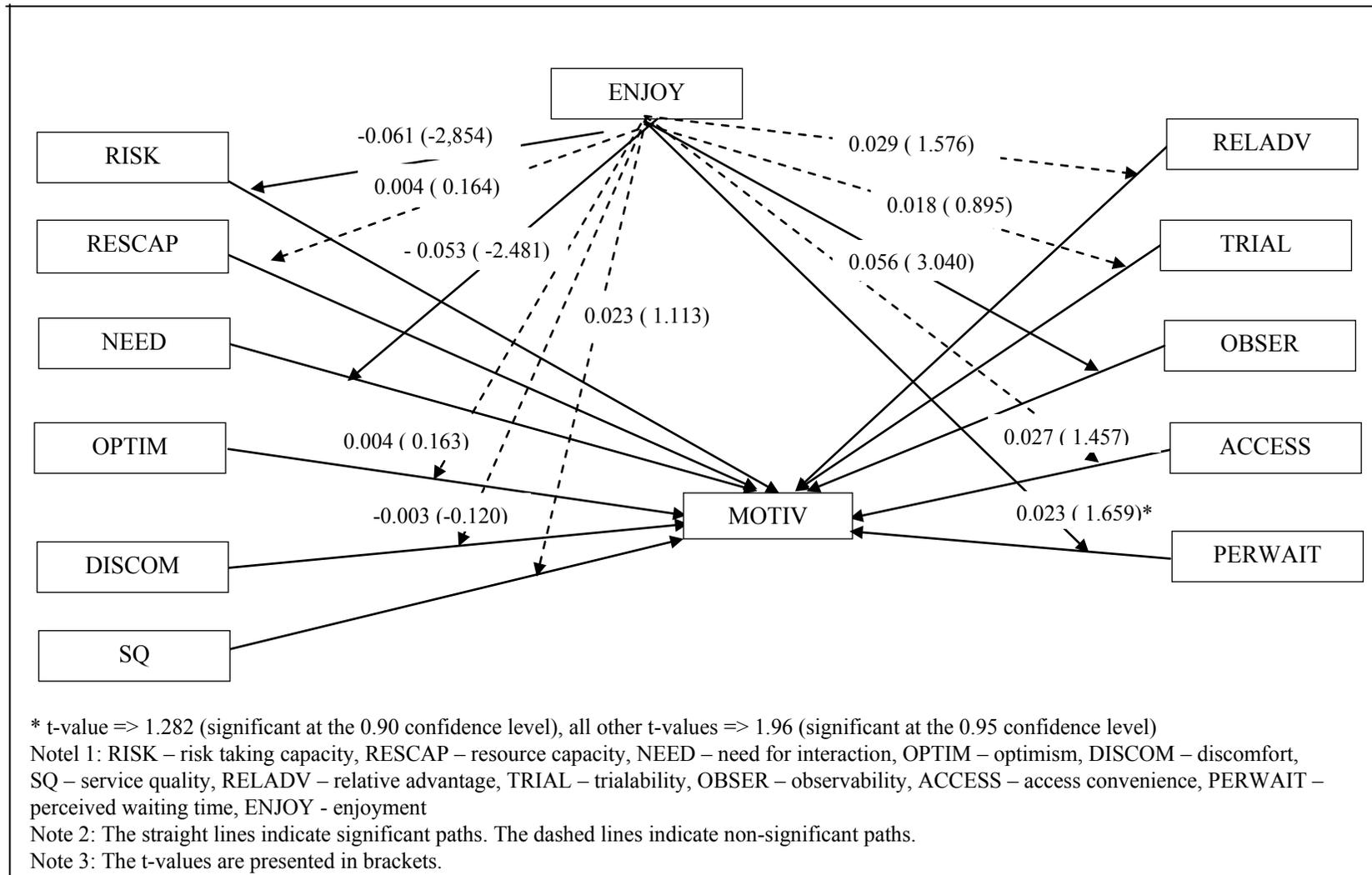
Figure 5.17: Interaction effect of role clarity on the relationship between relative advantage and co-production motivation



Note: MOTIV – Co-production motivation; RELADV – Relative advantage; ROLE – Role clarity

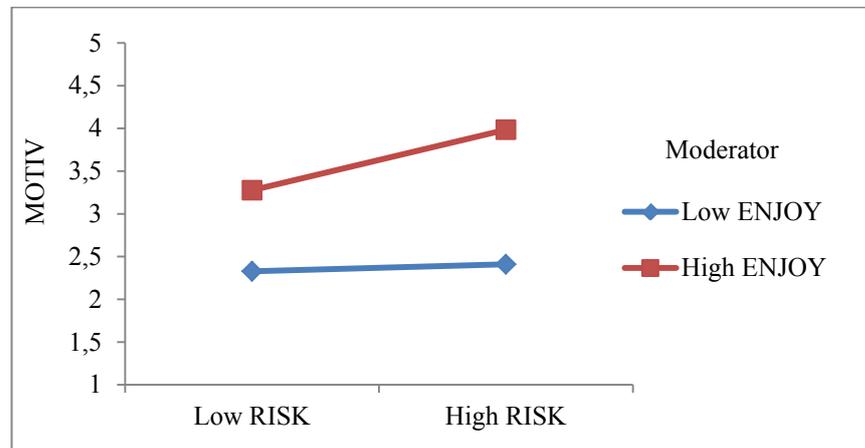
Role clarity (ROLE) also strengthens the positive relationship between relative advantage (RELADV) and co-production motivation (MOTIV) (H20j supported). Thus, high role clarity amplifies or positively moderates the relationship between relative advantage (RELADV) and co-production motivation (MOTIV). Therefore, relative advantage (RELADV) has stronger effect on co-production motivation (MOTIV) when there is high role clarity (ROLE).

Regarding enjoyment, four of the paths regarding interaction effects were found to be significant as presented in Figure 5.18. The main effect of risk taking capacity (RISK) on co-production motivation (MOTIV) is moderated by enjoyment (ENJOY) ($\beta = 0.061$, $t = 2.854$, $p < 0.05$) supporting H21b. Similarly, the moderating effect of enjoyment (ENJOY) was significant between need for interaction (NEED) and co-production motivation (MOTIV) ($\beta = -0.053$, $t = -2.481$, $p < 0.05$). This result supports H21d. Moderating variable enjoyment had the strongest interaction effect on the relationship between observability (OBSER) and co-production motivation (MOTIV) ($\beta = 0.056$, $t = 3.040$). H21m was supported on the 0.95 confidence level. Finally, enjoyment (ENJOY) found to moderate the relationship between perceived waiting time (PERWAIT) and co-production motivation (MOTIV) on 0.90 confidence level ($\beta =$



0.023, $t = 1.659$, $p < 0.10$). This result supports H21r. Figures 5.19 through 5.22 plots the direction for the significant interaction effects.

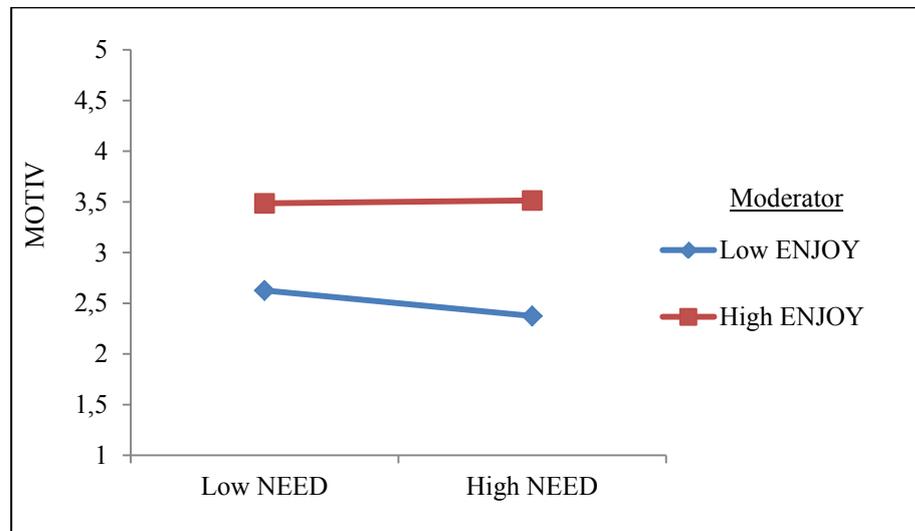
Figure 5.19: Interaction effect of enjoyment on the relationship between risk-taking capacity and co-production motivation



Note: MOTIV – Co-production motivation; RISK – Risk-taking capacity; ENJOY – Enjoyment

Enjoyment (ENJOY) positively moderates the relationship between risk-taking capacity (RISK) and co-production motivation (H21b supported). Thus, for low enjoyment (ENJOY) the effect of the moderator is not strong. Yet, as high enjoyment (ENJOY) enters the relationship between risk-taking and co-production motivation, the positive relationship is strengthened by the moderating effect of enjoyment (ENJOY). Accordingly, risk-taking capacity (RISK) has stronger effect on co-production motivation (MOTIV) when there is high enjoyment (ENJOY).

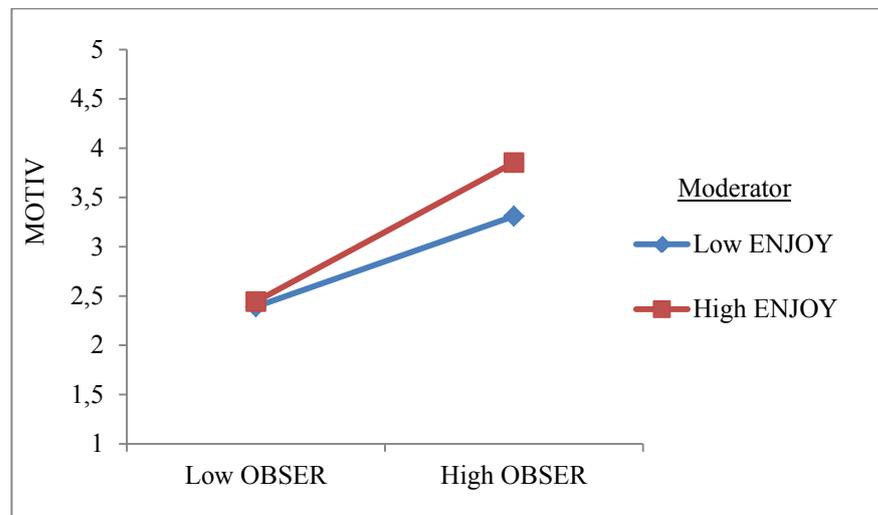
Figure 5.20: Interaction effect of enjoyment on the relationship between need for interaction and co-production motivation



Note: MOTIV – Co-production motivation; NEED – Need for interaction; ENJOY – Enjoyment

Enjoyment (ENJOY) attenuates the negative relationship between need for interaction (NEED) and co-production motivation, supporting H21d. Accordingly, with realization of enjoyment (ENJOY), the negative relationship between need for interaction (NEED) and co-production motivation (MOTIV) is dampened. In other words, need for interaction (NEED) has a weaker effect on co-production motivation when there is high enjoyment (ENJOY).

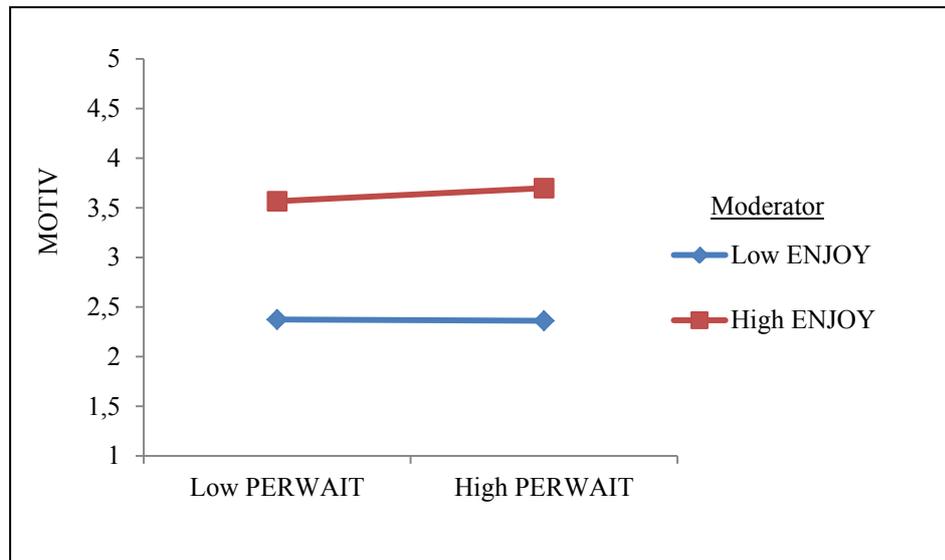
Figure 5.21: Interaction effect of enjoyment on the relationship between observability and co-production motivation



Note: MOTIV – Co-production motivation; OBSER - Observability; ENJOY – Enjoyment

Enjoyment (ENJOY) strengthens the positive relationship between observability (OBSER) and co-production motivation (MOTIV) (H21m supported). In other words, inclusion of the high enjoyment as the moderator increases the positive slope between observability (OBSER) and co-production motivation (MOTIV), strengthening the positive main effect.

Figure 5.22: Interaction effect of enjoyment on the relationship between perceived waitingtime and co-production motivation



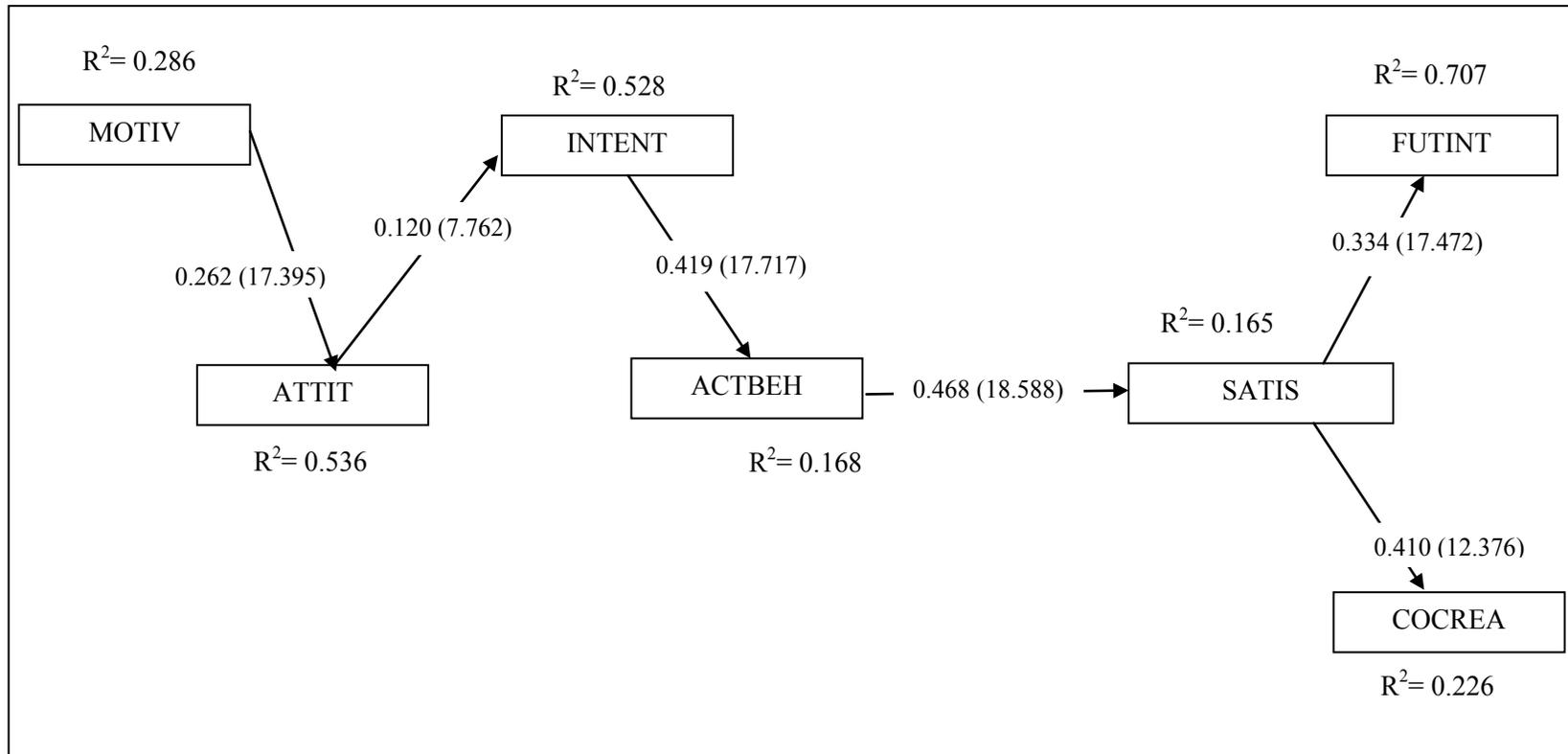
Note: MOTIV – Co-production motivation; PERWAIT – Perceived waiting time; ENJOY – Enjoyment

Enjoyment (ENJOY) strengthens the positive relationship between perceived waiting time (PERWAIT) and co-production motivation (MOTIV) (H21r supported). In other words, inclusion of the high enjoyment as the moderator amplifies the positive slope between perceived waiting time (PERWAIT) and co-production motivation (MOTIV), strengthening the positive main effect.

The examination of the path estimates regarding the attitudinal constructs following co-production motivation through hypothesized outputs are presented graphically in Figure 5.23. The assessment of the estimates showed that all causal links hypothesized was statistically significant at the 0.95 confidence level.

Co-production motivation (MOTIV) is found to be strong predictor of attitude towards co-production (ATTIT) explaining 53.6 percent of its variance. The direct path between co-production motivation (MOTIV) and attitude towards co-production (ATTIT) was statistically significant ($\beta = 0.262, t = 17.395, p < 0.05$). Thus, H22 was supported.

H23 was also supported as the direct causal relationship between co-production attitude and intention to co-produce (INTENT) was statistically significant at the 0.95 confidence level ($\beta = 0.120, t = 7.762$). Co-production attitude (ATTIT) explained 52.8



All t-values => 1.96 (significant at the 0.95 confidence level)

Note 1: R^2 – Variance explained, MOTIV – co-production motivation, ATTIT – attitude towards co-production, INTENT – intention to co-produce, ACTBEH – actual co-production behavior, SATIS – satisfaction, FUTINT – future intention to co-produce, COCREA – attitude towards co-creation of value

Note 2: The t-values are presented in brackets.

Figure 5.23: The structural model, standardized regression weights, t-values and variance explained from motivation through co-production

percent of the variance in intention to co-produce (INTENT).

Another strong direct causal relationship existed between co-production intention (INTENT) and actual co-production behavior (ACTBEH), supporting H24. While intention to co-produce explained 16.8 percent of the variance on actual behavior, the causal link was found to be statistically significant at the 0.95 confidence level ($\beta = 0.419$, $t = 17.717$, $p < 0.05$).

Future intention to co-produce (FUTINT) and attitude towards co-creation of value (CREA) are the hypothesized outcomes of the co-production process. It has been proposed that co-production satisfaction (SATIS) predicts future intention to co-produce (FUTINT) (H27 supported) and attitude towards co-creation of value (COCREA) (H28 supported). As the result of the assessments it was concluded that satisfaction (SATIS) was a strong predictor of future intention to co-produce (FUTINT) explaining 70.7 percent of its variance.

The direct causal path between the variables were statistically significant at the 0.95 confidence level ($B_{SATIS} = 0.334$, $t_{SATIS} = 17.472$, $p < 0.05$), supporting H27. Similarly, the relationship between satisfaction (SATIS) and attitude towards co-creation of value (COCREA) was found to be significant ($\beta_{SATIS} = 0.410$, $t_{SATIS} = 12.376$, $p < 0.05$), satisfaction (SATIS) explaining 22.6 percent of the variance in attitude towards co-creation of value. This result supported H28.

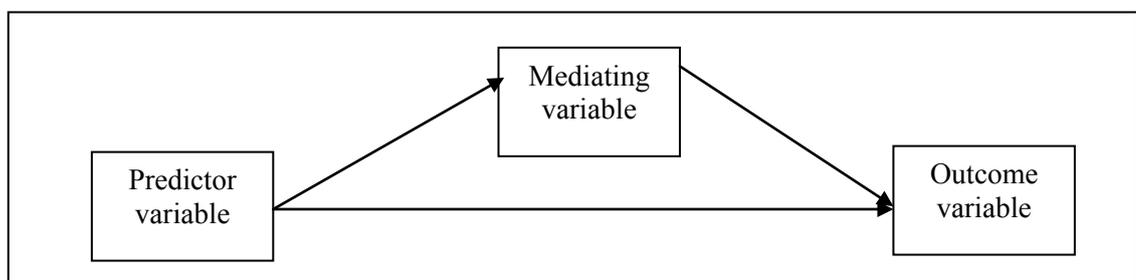
Once the analysis of the direct links were complete, the next step was to assess the hypothesized indirect effects in order to interpret the role of perceived values, which are emotional value (EMOVAL), social value (SOCVAL), and convenience value (CONVAL) as the mediating variables between actual behavior (ACTBEH) and satisfaction (SATIS) (H26a, H26c, H26e). Baron and Kenny (1986) propose a four step multiple regression analysis to test mediation. In the first step, the direct effect of predictor variable on outcome variable is assessed. In this study, the effect of actual co-production behavior (ACTBEH) on satisfaction (SATIS) is investigated. Second step is the test the direct effect of predictor variable on the mediating variable. This suggests that in the second step the direct effect of actual co-production behavior (ACTBEH) on perceived values will be assessed. Third step is the assessment of the mediator's effect

on the outcome variable. For this research, the third step is the assessment of the relationship between mediating variables of perceived value (EMOVAL; SOCVAL; CONVAL) on outcome variable, satisfaction (SATIS). During the initial three stages, the mediation analysis is stopped if any of the relationships are found to be not significant. Finally, the last stage includes regressing predictor variable and mediating variable together on the outcome variable. The mediation is said to occur if it can be concluded that the inclusion of the mediating variable decreases or diminishes the predictor variable's effect on outcome variable. If the path between predictor variable and outcome variable becomes insignificant with the inclusion of the mediating variables in the regression equation, the mediation is called to be a full mediation. In cases, where the predictor variable continues to predict the outcome variable, even with the inclusion of the mediating variables, yet loses its impact on the outcome variable, the mediation is called to be a partial mediation. Figure 5.24 is the graphical representation of the steps of the Baron and Kenny (1986) approach.

In order to test for mediation using the Baron and Kenny (1986) approach the following four steps will be followed.

- Step 1: Assessing the direct effect of actual behavior on satisfaction
- Step 2: Assessing the direct effect of actual behavior on perceived values
- Step 3: Assessing the direct effect of perceived values on satisfaction
- Step 4: Assessing the effect of perceived value and actual behavior on satisfaction

Figure 5.24: Baron and Kenny approach of four-step mediation testing



Source: Rueben M. Baron and David A. Kenny, 1986. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality & Social Psychology*. **51** (6), p. 1176.

The predictor variable for this study is the actual production behavior (ACTBEH). The outcome variable is co-production satisfaction (SATIS). The mediating variables are emotional value (EMOVAL), social value (SOCVAL) and convenience value (CONVAL). As suggested by Meuter et al. (2005) all mediating variables were tested independently which means that the four step approach was followed separately for each mediating variable proposed. The results of the three rounds of four-step approach are presented next.

Emotional value (EMOVAL) mediating the relationship between actual co-production behavior (ACTBEH) and satisfaction (SATIS)

As discussed above, the first step is to test the relationship between the predictor and outcome variable. Therefore, the direct effect of actual behavior (ACTBEH) on satisfaction (SATIS) was assessed first.

As predicted, the results showed that actual behavior (ACTBEH) was a predictor of satisfaction (SATIS) explaining 10.1 percent of its variance. The causal path between actual behavior (ACTBEH) and satisfaction (SATIS) was significant at the 0.99 confidence level ($\beta = 0.318$, $t = 11.087$). This result fulfilled the requirement of the first step of the mediation analysis.

Second step is the assessment of the relationship between the predictor variable -actual behavior (ACTBEH) and the mediating variable -emotional value (EMOVAL). The results showed that there was a statistically significant relationship between the variables although the explained variance in emotional value (EMOVAL) by actual behavior (ACTBEH) was fairly low ($R^2 = 0.043$, $\beta = 0.206$, $t = 6.976$), at the 0.99 confidence level. This result successfully completed the second step of the mediation analysis.

In the third step, the mediating variable's-emotional value (EMOVAL), effect on outcome variable-satisfaction (SATIS) was tested. The results showed a strong positive relationship between emotional value (EMOVAL) and satisfaction (SATIS). The direct effect was significant at the 0.99 confidence level ($\beta = 0.647$, $t = 28.030$), explaining 41.8 percent of the variance in satisfaction (SATIS). Therefore, the third step of the four-step mediation testing was satisfied.

In the final step of the mediation analysis, the predictor variable and the mediating variable was regressed on the outcome variable in combination. The results showed that although actual behavior (ACTBEH) still had a statistically significant impact on satisfaction (SATIS), the dominant predictor of satisfaction was emotional value (EMOVAL) ($\gamma_{ACTBEH} = 0.193$, $t_{ACTBEH} = 8.428$; $\beta_{EMOVAL} = 0.607$, $t_{EMOVAL} = 26.551$). This results indicates that since the path between the predictor variable and outcome variable is still significant mediation cannot be a full mediation, but a partial one.

In order to conclude in partial mediation, the standardized regression weights of the path between actual behavior (ACTBEH) and satisfaction (SATIS) in step one and step four needs to be compared. Partial mediation is said to occur if, and only if, there is a drop in the standardized regression weight of the said path in the mediated model. The results showed that the standardized coefficient of the path from actual behavior (ACTBEH) to satisfaction (SATIS), representing the total effect (c) has shown a decrease in the fourth step of analysis from 0.318 to indirect effect of 0.193 (c'), which is a strong illustration of partial mediation. Table 5.37 summarizes the relationships tested during the four-step approach of mediation analysis for emotional value.

Table 5.37: Emotional value’s mediating effect on the relationship between actual behavior and satisfaction

	β	
	EMOVAL	SATIS
Step 1		
ACTBEH		0,318
<i>t</i>		11,087
\bar{R}^2		0,101
Step 2		
ACTBEH	0,206	
<i>t</i>	6,976	
\bar{R}^2	0,430	
Step 3		
EMOVAL		0,647
<i>t</i>		28,030
\bar{R}^2		0,418
Step 4		
ACTBEH		0,193
<i>t</i>		8,428
EMOVAL		0,607
<i>t</i>		26,551
\bar{R}^2		0,453

$p < 0,001$

ACTBEH – Actual behavior; EMOVAL – Emotional value;

SATIS - Satisfaction

In order to assess if the drop in standardized coefficient is statistically significant the Sobel test (Sobel 1982) is performed. Although Sobel test (Sobel 1982) has been criticized for its low statistical power, MacKinnon et al. (2002) suggest the cutoff number to overcome to this issue is to work with samples over 1000. As the sample size for this study exceeds 1000 benchmark, Sobel test (Sobel 1982) has been performed to assess whether the reduced standardized coefficient is statistically different in steps 1 and 4 of the mediation analysis.

The result of the Sobel test (Sobel 1982) produced a z-test statistic score of 3.603 ($z' > 1.96$; $p < 0.001$), allowing the researcher to reject the null hypothesis to conclude that the drop in impact of actual behavior (ACTBEH) on satisfaction (SATIS) was

statistically significant when the mediator emotional value (EMOVAL) was introduced to the model. The results of the four-step mediation analysis of Baron and Kenny (1986) approach and the Sobel test (Sobel 1982) concluded that emotional value partially mediates the relationship between actual behavior (ACTBEH) and satisfaction (SATIS), partially supporting H26a.

Social value (SOCVAL) mediating the relationship between actual co-production behavior (ACTBEH) and satisfaction (SATIS)

The first step of the four-step approach of the Baron and Kenny (1986) requires the investigation of the relationship between predictor variable -actual behavior (ACTBEH) and outcome variable-satisfaction (SATIS). However, this path has already been assessed during the analysis for emotional value above. The relationship is found to be statistically significant ($\beta = 0.318$, $t = 11.087$) at the 0.99 confidence level.

As the requirement of the first step was fulfilled, the second step was testing the relationship between actual behavior (ACTBEH) and social value (SOCVAL). The regression analysis concluded that the relationship was significant at the 0.99 confidence level, actual behavior (ACTBEH) explaining 21.0 percent of the variance in social value ($\beta = 0.147$, $t = 4.924$). Thus, the requirements of the second step was met.

The third step was to investigate the relationship between the mediating variable -social value (SOCVAL) and outcome variable-satisfaction (SATIS). The results indicated a statistically significant relationship between social value (SOCVAL) and satisfaction (SATIS) at the 0.99 confidence level ($\beta = 0.443$, $t = 16.340$). Social value (SOCVAL) explained 19.6 percent of the variance in satisfaction (SATIS).

Finally, in the last step the predictor variable and mediating variable was regressed on the outcome variable together. The results showed that social value (SOCVAL) was a stronger predictor of the outcome variable-satisfaction (SATIS) compared to actual behavior (ACTBEH) ($\gamma_{ACTBEH} = 0.258$, $t_{ACTBEH} = 9.824$; $\beta_{SOCVAL} = 0.405$, $t_{SOCVAL} = 15.406$). The fact that actual behavior was still a statistically significant predictor of outcome variable satisfaction (SATIS) was the evidence to conclude that a full mediation could not be argued. However, actual behavior's (ACTBEH) impact on satisfaction (SATIS) was decreased by the inclusion of the mediating variable social

value (SOCVAL). The drop in standardized coefficient from 0.318 to 0.258 was the indicator of partial mediation.

Yet, Sobel test (Sobel 1982) was needed to be performed to see, if the decrease in the regression coefficient was statistically significant to conclude partial mediation. Table 5.38 summarizes the relationships tested during the four-step approach of mediation analysis for social value.

Table 5.38: Social value’s mediating effect on the relationship between actual behavior and satisfaction

	β	
	SOCVAL	SATIS
Step 1		
ACTBEH		0,318
<i>t</i>		11,087
$\overline{R^2}$		0,101
Step 2		
ACTBEH	0,147	
<i>t</i>	4,924	
$\overline{R^2}$	0,210	
Step 3		
SOCVAL		0,443
<i>t</i>		16,340
$\overline{R^2}$		0,196
Step 4		
ACTBEH		0.258
<i>t</i>		9,824
SOCVAL		0,405
<i>t</i>		15,406
$\overline{R^2}$		0,262

$p < 0,001$

ACTBEH – Actual behavior; SOCVAL – Social value;

SATIS - Satisfaction

The result of the Sobel test (Sobel 1982) showed a z-test statistic of 2.326, which is greater than the absolute value of 1.96 (Sobel 1982) ($z' > 1.96; p < 0.005$) to conclude that the decrease in standardized coefficient of actual behavior (ACTBEH) when predicting

satisfaction (SATIS) was statistically significant by the inclusion of mediating variable social value (SOCVAL).

Therefore, the results of the four-step Baron and Kenny (1986) approach of mediation testing, as well as the result of the Sobel test (Sobel 1982) showed that social value partially mediated the relationship between actual behavior (ACTBEH) and satisfaction (SATIS). This result partially supported H26c.

Convenience value (CONVAL) mediating the relationship between actual co-production behavior (ACTBEH) and satisfaction (SATIS)

The third value hypothesized to mediate the relationship between actual behavior (ACTBEH) and satisfaction (SATIS) was convenience value (CONVAL). In order to test mediating effect of convenience value (CONVAL), four-step approach of Baron and Kenny (1986) was applied again.

The first step of the mediation analysis was skipped as the same relationship was being investigated for the third time as the first step. Previous analysis had already concluded that the relationship between the predictor variable, actual behavior (ACTBEH) and the outcome variable, satisfaction (SATIS) was statistically significant at the 0.99 confidence level ($\beta = 0.318, t = 11.087$).

Second step consisted of the analysis between the predictor variable, actual behavior (ACTBEH) and the mediating variable-convenience value (CONVAL). The regression analysis showed that the causal path hypothesized was significant at the 0.99 confidence level and actual behavior (ACTBEH) explained 13.5 percent of the variance in convenience value ($\beta = 0.367, t = 13.043$).

In the third step, the relationship between mediating variable-convenience value (CONVAL) and outcome variable-satisfaction (SATIS) was tested. The regression analysis showed that convenience value (CONVAL) was a strong predictor of satisfaction (SATIS), explaining 51.1 percent of its variance. The impact of convenience value (CONVAL) on satisfaction (SATIS) was significant at the 0.99 confidence level ($\beta = 0.715, t = 33.793$). This result showed that the third step of the four step approach was satisfactory.

In the final step of the mediation analysis, the predictor variable-actual behavior (ACTBEH) and the mediating variable -convenience value (CONVAL) were regressed together on the outcome variable satisfaction (SATIS). As predicted, convenience value (CONVAL) had more impact on -satisfaction (SATIS) compared to actual behavior (ACTBEH). Yet, since the relationship between actual behavior (ACTBEH) and satisfaction was still significant, full mediation could not be concluded ($\beta_{ACTBEH} = 0.064$, $t_{ACTBEH} = 2.836$). When the standardized coefficients of the first step and the fourth step were compared, it was obvious that the impact of actual behavior (ACTBEH) on satisfaction (SATIS) had dropped dramatically from 0.318 to 0.064 with the inclusion of mediating variable -convenience value (CONVAL). This is accepted to be clear sign for partial mediation (Baron and Kenny 1986). 5.39 summarizes the relationships tested during the four-step approach of mediation analysis for convenience value.

Table 5.39: Convenience value’s mediating effect on the relationship between actual behavior and satisfaction

	β	
	CONVAL	SATIS
Step 1		
ACTBEH		0,318
t		11,087
$\overline{R^2}$		0,101
Step 2		
ACTBEH	0,367	
t	13,043	
$\overline{R^2}$	0,135	
Step 3		
CONVAL		0,715
t		33,793
$\overline{R^2}$		0,511
Step 4		
ACTBEH		0,064
t		2,836
CONVAL		0,691
t		30,496
$\overline{R^2}$		0,514

$p < 0,001$

ACTBEH – Actual behavior; CONVAL – Convenience value;
SATIS - Satisfaction

The result of the Sobel test (Sobel 1982) showed a z-test statistic of 9.384, which is greater than the absolute value of 1.96 (Sobel 1982) ($z' > 1.96; p < 0.005$) to conclude that the decrease in standardized coefficient of actual behavior (ACTBEH) when predicting satisfaction (SATIS) was statistically significant by the inclusion of mediating variable convenience value (CONVAL).

Therefore, the results of the four-step Baron and Kenny (1986) approach of mediation testing as well as the result of the Sobel test (Sobel 1982) showed that convenience value partially mediated the relationship between actual behavior (ACTBEH) and satisfaction (SATIS). This result showed partial support for H26e.

Testing for confounding effects of control variables

The final stage of analysis was the analysis of confounding effects of control variables on the proposed relationships. The first set of relationships tested was between the antecedent conditions and co-production motivation (MOTIV), when controlling for the demographic variables of gender, age, marital status, income, and education. The results showed that inclusion of demographic variables counted for nearly 2 percent of variance, which is an indicator that antecedent conditions, proposed theoretically, are stronger predictors of co-production motivation (MOTIV) compared to demographic variables. Accordingly, when controlled for demographic variables, the R^2 change was 0.019, resulting in $R^2_{\text{MOTIV}} = 0.312$. The paths between antecedent conditions and co-production motivation (MOTIV) was significant when controlling for demographic variables ($\beta_{\text{RISK}} = 0.178$, $t_{\text{RISK}} = 5.847$, $p < 0.05$; $\beta_{\text{RESCAP}} = 0.062$, $t_{\text{RESCAP}} = 1.866$, $p < 0.10$; $\beta_{\text{NEED}} = -0.066$, $t_{\text{NEED}} = 1.820$, $p < 0.10$; $\beta_{\text{OPTIM}} = 0.108$, $t_{\text{OPTIM}} = 2.863$, $p < 0.05$; $\beta_{\text{DISCOM}} = -0.107$, $t_{\text{DISCOM}} = -2.641$, $p < 0.05$; $\beta_{\text{SQ}} = 0.327$, $t_{\text{SQ}} = 6.629$, $p < 0.05$; $\beta_{\text{RELADV}} = 0.286$, $t_{\text{RELADV}} = 3.646$, $p < 0.05$; $\beta_{\text{TRIAL}} = 0.190$, $t_{\text{TRIAL}} = 5.307$, $p < 0.05$; $\beta_{\text{ACCESS}} = 0.261$, $t_{\text{ACCESS}} = 4.419$, $p < 0.05$; $\beta_{\text{PERWAIT}} = 0.097$, $t_{\text{PERWAIT}} = 2.868$, $p < 0.05$).

Similarly, the inclusion of demographic variables added relatively modest variance to the endogenous variables of the model ($\text{SMC}_{\text{ATTIT}} = 0.538$; $\text{SMC}_{\text{INTENT}} = 0.531$; $\text{SMC}_{\text{ACTBEH}} = 0.172$; $\text{SMC}_{\text{SATIS}} = 0.707$; $\text{SMC}_{\text{FUTINT}} = 0.538$; $\text{SMC}_{\text{COCREA}} = 0.228$). All paths when controlling for demographic variables were still significant at the 0.99 and 0.95 significance level ($\beta_{\text{ATTIT}} = 0.269$, $t_{\text{ATTIT}} = 17.899$; $\beta_{\text{INTENT}} = 0.124$, $t_{\text{INTENT}} = 7.923$; $\beta_{\text{ACTBEH}} = 0.419$, $t_{\text{ACTBEH}} = 9.886$; $\beta_{\text{SATIS}} = 0.472$, $t_{\text{SATIS}} = 10.798$; $\beta_{\text{FUTINT}} = 0.334$, $t_{\text{FUTINT}} = 16.185$; $\beta_{\text{COCREA}} = 0.432$, $t_{\text{COCREA}} = 11.123$).

The results of the analysis regarding control variables showed that all paths that were found to be significant in the research model were still significant when controlling for the demographic variables of age, gender, marital status, education and income level. The results supported H29b, H29c, H29d, H29f, H29g, H29j, H29l, H29m, H29o, H29p, H29q, H29s, H29t, H29u, H29v, H29w, and H29x.

Regarding paths which were not supported; six hypothesized paths between antecedent conditions and co-production motivation were found to be not significant. Accordingly,

the positive relationship between expertise capacity and co-production motivation ($\gamma = 0.022$, $t_{\text{EXPCAP}} = 0.252$, $p > 0.05$) (H1); innovativeness and co-production motivation ($\gamma_{\text{INNOV}} = 0.003$, $t_{\text{INNOV}} = 0.813$, $p > 0.05$) (H6); compatibility and co-production motivation ($\gamma_{\text{COMPAT}} = -0.005$, $t_{\text{COMPAT}} = 0.283$, $p > 0.05$) (H10); complexity and co-production motivation ($\gamma_{\text{CMPLX}} = 0.012$, $t_{\text{CMPLX}} = -0.103$, $p > 0.05$) (H12); communication quality and co-production motivation ($\gamma_{\text{CQ}} = 0.006$, $t_{\text{CQ}} = 0.120$, $p > 0.05$) (H15); perceived crowdedness and co-production motivation ($\gamma_{\text{PERCROW}} = 0.005$, $t_{\text{PERCROW}} = 0.890$, $p > 0.05$) (H19) were not supported.

One of the important steps of concluding in not supporting of a hypotheses is determining whether the data had enough power to make such a conclusion (Hair et al. 2006). Therefore, the researcher is urged to run post-hoc statistical power analysis to interpret whether, the model was strong enough to detect the significant effects (Gaskin 2012). Hair et al. (2010, p.466) especially suggests running statistical power analysis when “significant differences are not found”, suggesting an observed statistical power to exceed 0.80 level. Therefore, post-hoc statistical power analysis have been performed to conclude that the model had enough statistical power to conclude the paths hypothesized can actually be rejected. The results of the post-hoc statistical power analysis showed a statistical power to be 0.999 ($1 - \beta > 0.80$). Since the observed statistical power of the model was greater than threshold level of 0.80 suggested, it was concluded that the model had enough statistical power to make conclusions on not supported paths.

The results of the hypothesis testing is presented in Appendix G.1.

6. DISCUSSION

The aim of this research was to delineate the co-production process in self-service technologies (SSTs) and link co-production process consequences to customer's future intention to co-produce and attitude towards co-creation of value with his/her co-production partner. To this end, a research model has been theorized to constitute the antecedents for the co-production process. Such antecedent conditions are argued to encompass the essential elements of the customer, the company and the service to be co-produced. Furthermore, situational factors are taken into consideration to understand their impact on the co-production process. It has been argued that antecedent conditions are essential igniters to develop co-production motivation. Once the customer is motivated to co-produce, such motivation will translate into behavioral intention through positive attitude towards collaboration in production (Fishbein and Ajzen 1975). Stemming from Theory of Reasoned Action (TRA) (Fishbein and Ajzen 1975), it is claimed that intention to co-produce will result in actual co-production behavior. Furthermore, it has been argued that co-production satisfaction will be realized through perceived value, and such satisfaction will be translated into future intention to co-produce and positive attitude towards co-creation of value with the co-production partner.

Built upon the argument above, a structural model that incorporates antecedent conditions (individual characteristics, self capacities, company linked factors, service linked factors, situational factors), co-production and value extraction related constructs, attitude towards co-creation value as well future intention to co-produce have been tested.

This section discusses the results of the data analysis in order to answer the research questions proposed and support the theory put forth. The discussion includes the findings of this study and aims to argue the significant points in light of the previous findings and theory proposed. Furthermore, the findings of this study is discussed in comparison to the existing literature.

6.1 CUSTOMER LINKED FACTORS AS ANTECEDENT CONDITIONS FOR CO-PRODUCTION MOTIVATION IN SELF SERVICE TECHNOLOGIES

One of the objectives of this study was to delineate the determinants of the co-production motivation in SSTs while taking into account all essential parties. To this end, the antecedent conditions for customer, company, and service to be co-produced have been explored to understand their impact on forming co-production motivation.

The results of the analysis showed that risk-taking capacity, resource capacity, and need for interaction are the set of determinants related to customers' self capacities which influence co-production motivation.

Risk-taking capacity in this model represents the degree of tolerance for uncertainty in co-production consequences. Consequently, it has been suggested that as the tolerance level for risk increases, the customer will have greater risk-taking capacity and higher motivation to engage in co-production. As suggested, results indicate that customer's risk-taking capacity have a positive impact on co-production motivation (H3 supported). This finding suggests that propensity towards risk taking ignites co-production motivation. Before, advancing to delineation of this result, it is important to establish the importance of risk-taking capacity for the research model proposed.

The literature suggests customers often have sense of uneasiness while accepting SSTs, even when this new form of offering possesses clear advantages (Meuter et al. 2005, Yen 2005, Meuter et al. 2003). The reason for this lack of enthusiasm has been argued through customers' perception of complexity, insecurity, and risk perceptions (Ho and Ko 2008). Two distinct qualities of SSTs seem to be the root of such uneasiness. First, as the name implies, SSTs depend on technology, which may, at time make its users frustrated and uncomfortable (Lin and Hsieh 2006). Meuter et al. (2003) mention technophobic customers, who are extremely uncomfortable using SSTs, since they perceive variety of risks regarding its technology based outcomes. Second, through SSTs, customers are asked to co-produce at least a part of the offering, which inherently suggests that the risk studied under the rubric of intangibility is basically shared if not completely undertaken by the customer (Laroche et al. 2003). In other words, co-producing over SSTs, customers not only move away from the safe zone of tangible

products but also commit to process with their own resources, where neither the process nor the outcomes are at all predictable (Laroche et al. 2004). Therefore, co-producing over SSTs bears variety of perceived risks, which may affect customers' motivation of engagement.

Prior studies as well as this study have used dimensions of Technology Readiness Index (TRI) (Parasuraman et al. 2000) to understand customer's predisposition towards technology in order to investigate related perceived risks in SSTs (Gelderman et al. 2011, Lin et al. 2007, Liljander et al. 2006, Lin and Hsieh 2006). Others have used, including this study, need for interaction to measure second path of perceived risk; one that is related to intangibility aspect. The findings helped towards gaining a better understanding on the role of service employees during co-production process. Nevertheless, while these investigation were illuminating for understanding the type and level of perceived risk, no prior study has taken into the fact that the customers' have different threshold levels of risk absorption. Consequently, risk-taking capacity is not about how much risk is perceived whether due to the offering's technological nature or being alone while producing the service, but individual's own perception of ability to recover from loss (Dulebohn 2002). This is the reason why Bromiley and Curley (1992) argue that risk is far more complex issue that needs to be evaluated on individual context rather than situational contexts.

The individual context of risk absorption is presented and suggested as an antecedent condition that is related to customer linked factors for this study in the form of risk-taking capacity. The findings reveal that it is the strongest predictor of co-production motivation in the context of customer linked factors. This result suggests that customers may evaluate a situation in terms of the nature and level or extent of risk involved (Jackson and Dutton 1988, Dutton and Jackson 1987). However, they also evaluate the level of their own willingness to take the risk involved. As a result, as customer's own perception of risk absorption increases, s/he will have increased motivation to co-produce over SSTs. Therefore, finding new ways to increase their partners' risk propensity or risk absorption levels may be at the interest of companies since more risk they are capable of bearing translates into more motivation on customer's part.

Another important finding of this study is resource capacity's impact on co-production motivation. As argued in earlier sections of this work, the importance of resources within Service Dominant Logic (SDL) is crucial. SDL makes a distinction between operant and operand resources and asserts that operant resources are at the heart of value co-creation process (Vargo and Lusch 2004a). This distinction lies on the earlier work of Constantin and Lusch (1994). They define operand resources as those resources which an act needs to be employed upon to produce any kind of effect. Accordingly, any kind of resources besides expertise, abilities, skill and knowledge have been categorized as operand resources such as time, money, land, and natural resources (Vargo and Lusch 2004a). Furthermore, it is only through operant resources, these static resources come to life to produce the desired effects (Grönroos 2011, Grönroos 2008, Vargo and Lusch 2004a). This may be the reason why majority of empirical research on SDL incorporates the constructs of expertise, experience, ability, and/or knowledge in order to investigate the co-production and co-creation phenomena (Eastlick et al. 2012, Auh et al. 2007, Meuter et al. 2005). Even though superiority of operant resources seem to have been accepted without too much argument, the lack of interest in operand resources in empirical sense seems to be common. Hence, to the best of researcher's knowledge, no previous empirical study has ever investigated the concept of operand resources in relation to any other construct within the domain of SDL. Although pure logic dictates that one has to have operand resources in the first place in order to act ability, knowledge, and mental skills on them, there seems to be no previous research on the subject.

Consequently, this study operationalizes resource capacity as totality, and variety of resources that are invested in co-production process to produce the desired outcomes. The resource capacity has been argued to be a determinant of co-production motivation as a part of customer linked factors. The findings support theory put forth, as the positive relationship between resources capacity and co-production motivation has been supported (H4 supported). This finding suggests that having operand resources at one's disposal motivates the customer to co-produce in SSTs. Therefore, as it has been suggested in different studies, experience, expertise, knowledge and abilities may indeed be important to co-production in SSTs (Eastlick et al. 2012, Meuter et al. 2005,

Andreassen and Lindestad 1998), yet having operand resources is also important determinant that motivates customer in such engagement of collaboration.

Inclusion of operand resources in the research model and evidence of its impact on co-production motivation have both theoretical and managerial implications which will be further discussed in the next sections.

A customer linked factor that has been found to negatively influence co-production motivation is customer's need for interaction (H5 supported). The construct of need for interaction is important since SSTs change the nature of interaction during the service production and delivery. Lee and Allaway (2002) assert that not all customers respond to this change in a favorable way since for them, the human touch is an essential part of the service offering. Similarly, Dabholkar and Bagozzi (2002) tie need for interaction with desire to avoid technology. The main idea behind the hypothesized negative relationship between need for interaction and co-production motivation is that customers who wish to engage in interpersonal interaction with service employee during service delivery will be less motivated to engage in co-production using SSTs. Thus, such customers will seek and tend to favor more traditional options of service delivery that includes direct interaction with company employees. The results show that, in fact, for those customers who have desire for interaction during service provision, the motivation to co-produce over SSTs are negatively impacted. This result echoes Meuter et al.'s (2005) findings, as they report that the need for interaction has a negative impact on trial in SSTs. Similarly, Gelderman et al. (2011) demonstrate some customers simply prefer personal service as the findings of their study show the need for interaction has a negative impact on SST usage. Reinders et al. (2008) investigating need for interaction on technology based self services report that the need for interaction had a direct negative impact on attitude towards using such technologies. The findings regarding the need for interaction show when customers' need for personal attention during service delivery is high, they will avoid using SSTs; thus, they will not be willing to produce their part in the production of the service. On the other hand, for customers whose need for service employee presence is low, motivation of co-producing over SSTs will be higher.

Eastlick et al. (2012) tested the impact of the need for interaction in SSTs on extrinsic motivation and reported an insignificant relationship. According to authors, a plausible explanation for the discordant findings with other studies is the setting of the SSTs. Eastlick et al. (2012) argue since the context of their study was self-check-out of a grocery store, the need for interaction had less impact on motivational constructs. They claim that the shoppers had plenty of opportunity to interact with service employees during time they shopped in the grocery store prior to actual self-check-out process. Therefore, their need for interaction may have been satisfied prior to actual checking-out of the store. Whereas in this study, as well as Meuter et al.'s (2005) study, the actual setting is mostly customer's home or work where no prior interaction takes place. Although this seems like a reasonable explanation for the discordant findings, one must take note of the setting of Gelderman et al.'s (2011) study to further evaluate this explanation.

Gelderman et al.'s (2011) study investigated the relationship between need for interaction and attitude towards using SSTs in automated self-kiosk machines in an International airport, in which service employees were present. Their findings indicated that users of SST were in less need for interaction compared to non-users. Although the study did not specify the chance or amount of interaction between passengers and airline staff, the setting seem to be closer to Eastlick et al.'s (2012) grocery store environment rather than secluded environment of home or work, resembling Meuter et al.'s (2005) or current study. Therefore, further explanations on inconsistent findings should be investigated.

One possible explanation on the issue may lie in the domain of service classification (Lovelock 1983). In his widely cited article Lovelock (1983) undertook the challenge of classifying services depending on their service delivery qualities. One of the five classification schemata of his work was regarding the method of service delivery as he argued that the nature of interaction between customer and service organization was a possible ground for classification. Lovelock (1983) classified services in terms of said nature as in Table 6.1.

Table 6.1: Classification of services according to method of service delivery

Nature of interaction between customer and service organization	Available service outlets	
	Single site	Multiple set
Customer goes to service organization	Eastlick et al.'s study (2012), Gelderman et al. (2011)	
Service organization goes to customer		
Customer and service organization transact at arm's length (mail or electronic communications)	Meuter et al. (2005) and present study	

Source: Matrix adapted from; Christopher H. Lovelock, 1983. Classifying services to gain strategic marketing insights. *Journal of Marketing*. 47, p. 18.

According to this classification, Eastlick et al.'s (2012) study is the only one, in which the customer goes to the particular, actual, and specific premise of the service organization, with the sole intention of visiting "the service provider" and none other. In other studies mentioned, the customer and service organization transact at arm's length. In the case of Meuter et al.'s (2005) and this study, "the arm's length" is at the far out of the reach of the service organization (such as the customer's home or office) whereas in Gelderman et al.'s (2011) study, the arm's length much shorter. Yet, while the customer shares the physical space (departure hall of an International airport), as in Gelderman's study (2011) with the service provider for logistic reasons, the interaction does not take part in the service provider's own grounds, but on more of a mutual territory. Therefore, the cues related to servicescape are not as strong in forming any sort of emotion or feeling of interaction. Bitner (1992, p. 59) explains this point through "the human behavior is influenced by the physical setting in which it occurs", as she argues that prior empirical studies in the field confirm that the physical setting effects the nature of interaction between the service provider and the customer. This suggests, another plausible explanation and discussion point may be, that customers visiting service provider's facilities do not actually need to interact with the service employee on one on one basis, since various servicescape cues fulfill such need. On the other hand, when the

co-production takes place either in the seclusion of one's own privacy, or on common grounds, need for interaction negatively impacts co-production motivation.

As the name implies, SSTs inherently bear a technological nature. Thus, they require certain degree of predisposition towards technology on customer's part. One of the most widely recognized ways of measuring technological disposition in marketing literature is Parasuraman's (2000) Technology Readiness Index (TRI). Parasuraman (2000, p. 308) defines technology readiness as "people's propensity to embrace and use new technologies for accomplishing goals in home life and at work".

TRI is a multidimensional scale that is made of two sets of mental enablers which are optimism and innovativeness. Optimism represents perceptions about technology in general in terms of control, flexibility, and efficiency it provides to its users (Parasuraman 2000). On the other hand, innovativeness is about person's views about his/her own desires regarding technological usage. Parasuraman (2000) defines innovativeness as tendency to be technologically pioneering or technological thought leader.

The flip side of mental enablers is mental inhibitors regarding technological readiness. Mental inhibitors consist of discomfort and insecurity. Parasuraman (2000) explain discomfort as person's feeling of lack of control, or feeling of overwhelm with technology. Similar to mental enablers' distinction, discomfort views the negative feelings on a narrower scale by taking one's own discomfort into account. Finally, the last leg is represented by insecurity and defined as person's lack of trust in technology and technology's ability to perform properly (Parasuraman 2000). As discussed on previous sections, although insecurity represents skepticism about the ability of technology to work properly on a broader scale, the label of the construct has been changed to skepticism because it is argued to capture the intended meaning better than the original caption.

The results of this study indicated that skepticism did not possess required reliability level to be accepted as a unique scale. As a result of this analysis, skepticism was dropped from the study. Previous studies using TRI faced similar problems. Taylor et al. (2002) used TRI on an e-insurance model and using Structural Equation Modelling

(SEM), reported that the data did not support the model suggested. The goodness of fit (GOF) indices suggested an unacceptable fit, and only after parceling the exogenous items in TRI and averaging the items within each parcel as theorized by Parasuraman (2000) were they able to save the dimension of discomfort. Skepticism dimension could not be salvaged. Similarly, Liljander et al. (2006) dropped the dimension of skepticism since the measurement scale did not meet required reliability levels. Gelderman et al. (2011) had also faced problems with mental inhibitors dimensions' factorial structures as they reported that items of discomfort and skepticism loaded highly on the same factor. They combined the two constructs of discomfort and skepticism to represent a general dimension of mental inhibitors although the newly formed construct still did not meet Cronbach's reliability level suggestion (Gelderman et al. 2011).

The results of the remaining three paths hypothesized in this study between innovativeness and co-production motivation, optimism and co-production motivation, and discomfort and co-production motivation showed that although discomfort and optimism were predictors of motivation (H7 and H8 supported), the effect of innovativeness was insignificant (H6 not supported). This result suggests that having a positive view of technology in general (possessing optimism) in the sense that it provides a person with increased control, flexibility, and efficiency over everyday life, impacts the person's motivation to co-produce using SSTs. On the other hand, having the desire to be technological pioneering or thought leader using technology (possessing innovativeness) has no statistically significant effect on co-production motivation. This result echoes the findings of Liljander et al. (2006) as the results of their study indicate that optimism was strongly related to customer's willingness to use SSTs. Furthermore, optimism had a positive impact on service quality, satisfaction and loyalty on SSTs setting (Liljander et al. 2006).

One of the interesting results of this study is the impact of discomfort on co-production motivation. As discussed in previous section, the dimension of discomfort could rarely be used in SST studies because it did not meet validity and reliability requirements in previous studies (Gelderman et al. 2011, Liljander et al. 2006, Taylor et al. 2002). Therefore, through this study, it was established that discomfort could be used as a separate dimension measuring negative feelings about technology in general, and

that such feelings had negative impact on co-production motivation. This result contradicts Gelderman et al.'s (2011) results as they have reported that the combined construct of discomfort and skepticism had no significant impact on SSTs usage.

The results of this study are interesting on several accounts. First, like other studies summarized above (i.e. Gelderman et al. 2011, Liljander et al. 2006, Taylor et al. 2002), the dimension that summarizes customer's distrust in technology and views on skepticism about its ability to work properly, have failed to form a unique factor. Second, this study was able to elicit factors that both belonged to mental enablers and mental inhibitors of technology readiness. Through representation of both major sub-dimensions, it was concluded that in fact, people do "harbor favorable and unfavorable views about technology" (Parasuraman 2000, p. 309) and both of those dimensions were able to be represented in the present study.

Finally, it should be noted that whether it is the mental inhibitors or the mental enablers, there seems to be two different levels of consciousness. While optimism is the mental enabler that represents favorable feelings regarding technology in more general or broader sense, innovativeness is person's own evaluation regarding technology. In other words, optimism is about what technology can do for a person, whereas innovativeness is about what a person can do with technology. Same pattern can be argued for mental inhibitors. While skepticism is being distrustful in technology in general, discomfort is about one's self-view of incapability with technology. Consequently, skepticism may be argued to be distrust in technology in general, yet discomfort is distrusting self with technology.

When, the results are discussed from this perspective, it may be concluded that when forming motivation to invest resources in co-production process, people take both positive and negative feelings into account. The favorable feelings stem from the positive view of technology in general, whereas the root of negative feelings is one's distrust in his/her own abilities to work with technology. Therefore, the overall positive feelings are attributed to technology's flexibility, efficiency, and control even though people may feel overwhelmed about using such technology. This result echoes and emphasizes the importance of the insignificant relationship found between expertise capacity and co-production motivation (H1 not supported).

A major finding of the study was the one regarding the relationship between expertise capacity and co-production motivation. As it was explained in section 3.1.1.1.1, this study defines expertise capacity as level of skill or knowledge already possessed or the potential to acquire skill and knowledge. The foundation of this definition lies on the work of Lusch et al.'s (1992) article, and it has been argued that expertise capacity defined as above captures the true essence of operant resources which will be employed on operand resources.

The use of expertise capacity in co-production literature, although under different names, is not new. Previous studies have included some aspect of expertise capacity in the broadest sense of operant resources under the rubrics of “previous experience”, (e.g. Eastlick et al. 2012, Dickerson and Reinders et al. 2008, Meuter et al. 2005, Eastlick 1996, Danko and MacLachlan 1983, Gentry 1983), ability (e.g. Hwang and Kim 2007, Meuter et al. 2000), and self-efficacy (e.g. Oyedele and Simpson 2007, Dabholkar and Bagozzi 2002). The results of the mentioned studies have indicated that previous experience, ability, or perception of self-efficacy was a strong determinant of attitudes, intentions, or usage in SSTs. Yet, as reported in the previous section, the results of this study indicate that the hypothesized relationship between expertise capacity and co-production motivation is insignificant (H1 not supported). This finding corroborates with the findings of Kim et al. (2012) as they have investigated the impact of ability and previous experience (separately, not as a combined construct) on the likelihood of trial in SSTs context and have reported that neither previous experience nor ability was a predictor of trial in SSTs. Therefore, the discordant findings surrounding the construct of expertise capacity needs further attention and elaboration.

One of the most comprehensive works on expertise in marketing literature is Alba and Hutchinson's (1987) article as they undertake the challenge of delineating the dimensions of consumer expertise. Alba and Hutchinson (1987, p. 411) discuss previous experience is not cumulative pool that every unique experience melts into the same mold to form a single “customer expertise” as they state “different tasks require different types of expertise and, therefore, task performance is improved by different types of experiences”. According to authors, simple repetition, cognitive effort, ability to analyze information, ability to elaborate information, ability to remember information are the

five dimensions that make up expertise (Alba and Hutchinson 1987). Since the customers are not aware of such distinction between different dimensions, for them, a single dimension or a combination of several dimensions may count for being expert on a specific task. For example, although they may regard ability to remember product/service information as the sole important dimension of expertise, they may overlook the fact that cognitive structures and different abilities regarding analyzing and elaborating information needs to kick-in in order for expertise to form. This result suggests that the construct of expertise capacity may be a multi-dimensional construct, which may have been insufficiently measured with taking into account limited dimensions.

A second plausible explanation is the nature of the technology or the innovative act that requires expertise. After reporting insignificant relationship between technology readiness and use of self-service kiosk machines at an international airport, Gelderman et al. (2011, p. 419) raised a point “Many experienced passengers might not consider self-service check-in at an airport as very innovative”. Accordingly, their perception of expertise as well as feeling of innovativeness may be altered by the context of the study. In other words, they may feel that since SSTs are not an innovative way to co-produce with the service provider, it is not possible for them to be technological pioneers or thought leaders through its usage. Therefore, they do not find it innovative enough to be motivated to co-produce over it. Furthermore, as argued by Alba and Hutchinson (1987) they may consider themselves as expert of innovative technology, yet since the context is not considered to be such an innovative one, their own perception of self expertise may not match context of the study. This point is further discussed in theoretical and managerial implications of this study.

6.2 SERVICE-LINKED FACTORS AS ANTECEDENT CONDITIONS FOR CO-PRODUCTION MOTIVATION IN SELF SERVICE TECHNOLOGIES

The second set of antecedents was represented with service linked factors. Through these factors, it was argued that not only the qualities of the person but also distinct qualities of the service to be co-produced had a significant impact on forming customers’ motivation to co-produce over SSTs. Although the idea of investigating

qualities of innovative service is not new, the practice of including such dimension in empirical studies of SSTs is relatively novel.

Rogers' (1995) and Gatignon and Robertson's (1991) studies have argued and demonstrated that the influence of different characteristics of a service would play a significant role in adoption and diffusion of innovations. Even though there has been extensive literature on different dimensions that could be utilized to measure the innovation characteristics, one of the most studied and well accepted model is Rogers' (1995) dimensions of relative advantage, compatibility, observability, trialability, and complexity. This study sought to explain these dimension's impact on customer's co-production motivation and showed that relative advantage, trialability, and observability have positive effect on co-production motivation (H11, H13, and H14 supported).

Relative advantage is one of the most commonly used dimension in SSTs literature since it overlaps with another commonly used technology acceptance dimension; perceived usefulness (Davis et al. 1989). Relative advantage, defined as the superiority of an innovation compared to the one it replaces, has been used in the empirical studies in the field of technology adoption repeatedly. Van Slyke et al. (2002) have used relative advantage in the context of web-based shopping to conclude its strong impact on intention to use. Similarly, Eastlick et al. (2012) in self-check-out application, Liao and Lu (2008) in e-learning, Lin and Lee (2006) in knowledge management system implementation, and Meuter et al. (2005) in online or interactive telephone ordering system have demonstrated that relative advantage had impact on intentions, attitude, trial, and use in SSTs. As a matter of fact, in their 1982 meta-analysis Tornatzky and Klein argue relative advantage to be a consistent indicator in innovation adoption studies. Therefore, through demonstration of relative advantage's impact on co-production motivation, this study, in parallel with the previous studies, concludes that as customers evaluate online check-in to be more advantages than other available forms of checking in, they will have greater motivation to co-produce over online check-in.

Another major finding with regard to service linked factors is trialability's impact on co-production motivation. Trialability being defined as the degree which an innovation may be experimented in limited basis, is one of the least studied dimensions of innovation characteristics. One of the important reasons for this lack of interest is

because trialability dimension does not overlap with Davis et al.'s (1989) Technology Acceptance Model (TAM) (Eastlick et al. 2012, Chen et al. 2002) in any direction. The two distinct empirical research that have used the dimension of trialability is Meuter et al. (2005), where trialability was reported as a weak indicator of trial in SSTs, and Laio and Lu (2008), where trialability's impact on intention of adoption in e-learning was found to be insignificant. In light of this discussion, it may be concluded that using trialability in a SSTs study is an understudied phenomenon which requires further attention.

The results of this study have demonstrated that trialability was a determinant of co-production motivation in SSTs. This finding suggests that having the opportunity to try the SST on a limited basis positively impacts customer's motivation to co-produce over SSTs and makes trialability a determinant of motivation. Therefore, it is suggested that it is in companies' interest to create opportunities or platforms where customers may try using SSTs. The option of trial availability will encourage customers' motivation to co-produce over SSTs. This point has been put forth by Grönroos as early as 1978 as he argued that intangibility was the most important characteristic of services. He further stated (Grönroos 2007, p. 27);

The customer cannot feel, taste, smell, or see a service before he buys it. One cannot make thorough evaluation of service. However, such evaluation seems often to be desirable for most consumers, so they evaluate what they can: the interior of restaurant, the appearance of the air hostesses, and the behavior of the bank clerks.

The next question is what happens in SSTs when there is no interior to inspect or no employee to evaluate? The theory supporting this research argues that the customer relies on service linked factors for evaluation to count for the intangibility aspect. The findings suggest trialability serves as a mean to shape the flesh and bones of the service offering, where each *try run* may serve as the *brick* needed by the customer to overcome intangibility. Therefore, the importance of relative advantage and trialability may be interpreted as customers desire to reify the service offering through various try-outs in order to evaluate its benefits.

Another important point is that, merging different theoretical foundations and appropriate dimensions, and then using the overlapping constructs such as relative advantage hinders the importance and impact of different dimensions. Accordingly,

using all five dimensions of innovation characteristics (Rogers 1995) should be considered in the future.

As explained in the previous section, the five dimensions of innovation characteristics elaborated by Rogers et al. (1995) have been used as service linked factor determinants with relation to co-production motivation. Three of these five hypothesized dimensions' (compatibility, observability and complexity) effect on co-production motivation was persistent with the direction hypothesized. While compatibility and observability moved in the same direction as the co-production motivation, complexity moved in different direction as hypothesized. Yet, two of the five dimensions (compatibility and complexity) were not found to impact co-production motivation (H10 and H12 not supported).

Compatibility defined as the degree which an innovation is considered to be compatible with existing values, beliefs, experiences, and needs; and complexity defined as the degree to which an innovation is perceived as difficult to understand and use (Rogers 1995, p. 990) have been investigated in different contexts to different degrees. Complexity-resembling Davis et al.'s (1998) ease of use (in different direction) have gained attention through the studies of Eastlick et al. (2012), Meuter et al. (2005), Van Slyke et al. (2004), Eastlick and Lotz (1999). Yet, the findings of these studies seem to be inconsistent.

Van Slyke et al.'s (2004) study have shown that compatibility was the strongest predictor of web-based shopping while complexity and image (resembling observability) still had an impact on customer's decision to use this outlet. On a similar note, Eastlick et al.'s 2012 study on self-check-out context investigated innovation characteristics of compatibility, relative advantage, and ease of use and found that combination of characteristics predicted extrinsic motivation to use SSTs. In an earlier study of 1999, Eastlick and Lotz have reported that observability's impact on use of innovation to be insignificant. Similarly, Meuter et al. (2005) have reported that observability did not predict trial in SSTs.

Series of inconsistent findings in under-researched areas are to be expected. One possible reason for the differing findings may be the varying contexts used as the

domain of SSTs. For example, while explaining their unexpected findings regarding observability and complexity in tele-shopping context, Eastlick and Lotz (1999, p. 221) have argued that

While its interactive features are new, most consumers are still highly familiar with television as a communication medium for shopping. Therefore, there may not be a strong need to observe its use, and potential non-adopters may not see it as highly complex to use.

Another plausible explanation is the experience of the customers, who grade the importance of innovation characteristics in relation to intentions, attitudes, trial, or use. For example, while predicting the use intentions of e-learning, Liao and Lu (2008) have reported that compatibility had an impact in both groups of users with and without prior experience. Yet, while image (similar to observability) had an impact on intention to use for users with prior experience, the relationship between the two constructs were insignificant for users without prior experience. Therefore, it is argued that previous experience may have influence on how the consumers perceive innovation characteristics' impact on motivational or attitudinal constructs.

6.3 COMPANY LINKED FACTORS AS ANTECEDENT CONDITIONS FOR CO-PRODUCTION MOTIVATION IN SELF SERVICE TECHNOLOGIES

As this study established that in order to make conclusions on the co-production phenomenon, all parties and the service to be co-produced needs to be further investigated, and antecedent conditions of the service provider has been examined next.

In his exemplary work Bateson (1985) played with the term of partial employees. According to Bateson (1985), customers' involvement in the making of the service provision made them a crucial agent within the boundaries of the firm. It has been argued through this study that as customers involvement with company's processes as well as their commitment with their operant and operand resources increase, they will start to pick and choose between companies, which are worthy of their commitment. Nevertheless, besides the works of Wu et al. (2012), Shamdasani et al. (2008), and Auh et al. (2007), antecedent conditions, regarding quality of service or communication offered in co-production, have not been investigated in the literature.

This research argues that the customers would evaluate companies in terms of the quality of the service (Hsieh and Hiang 2004, Cronin and Taylor 1992) offered, and quality of the transmission of information (Mohr and Nevin 1990, Jablin et al. 1987) supplied through communication quality and service quality as the antecedent conditions regarding service provider. The findings demonstrated that service quality is the strongest determinant of co-production motivation above all other antecedent conditions (H16 supported). Yet, before moving on to the impact of service quality on co-production motivation, an important finding regarding service quality measure requires further evaluation.

In order to measure the quality of the service provided, the five dimensions of service quality generated by Parasuraman et al. (1988), which have been known as SERVQUAL, have been utilized. The five dimensions including tangibles, reliability, responsiveness, assurance, and empathy have been argued to represent the root of service evaluations in the eyes of the customer (Parasuraman et al. 1988). Although SERVQUAL has been used in variety of contexts throughout the years, some theoretical as well as operational criticism have been raised (Buttle 1996). Theoretical objections to SERVQUAL are based on several facts including the ones that SERVQUAL focuses on the “process of service delivery, not the outcomes of the service encounter” (Buttle 1996, p. 10). Although Buttle (1996) uses this point as a criticism, it provides the foundation of inclusion of SERVQUAL in this study rather than all other service quality measures that have been examined. As SERVQUAL was compared and contrasted with nine other service quality measures; Technical and Functional Quality Model (Grönroos 1984), Attribute Service Quality Model (Haywood-Farmer 1988), Performance Only Service Quality Model (Cronin and Taylor 1992), Ideal Value Model of Service Quality (Mattsson 1992), Evaluated Performance and Normed Quality Model (Teas 1993), Attribute and Overall Affect Model (Dabholkar 1996), Pivotal-Core-Peripheral Attribute Service Quality Model (Philip and Hazlett 1997), Internal Service Quality Model (Frost and Kumar 2000), and Internal Service Quality Data-Envelope Analysis Model (Soteriou and Stavrinides 2000), it was concluded that since what needed to be measured was mainly customers’ evaluations of service providers processes in terms of co-production, it would yield the most suitable framework for assessing service quality. The reason why customers evaluate the company in the first place is to decide whether

they will be motivated to embark on a new process; the co-production process, with service provider in question. Therefore, Buttle's (1996) criticism on this theoretical issue does not hold for the current study.

However, in this same article, Buttle (1996) argued that another major theoretical shortcoming of SERVQUAL was its dimensionality. He argued "items do not always load on to the factors which one would a priori expect and there is a high degree of intercorrelation between the five RATER dimensions" (Buttle 1996, p. 10). A literature review on studies that have used SERVQUAL seem to agree with this point. Carman, in his 1990 study extracted nine distinct dimensions using SERVQUAL. Gagliano and Hathcote's (1994) study was concluded with a four factor solution. Bouman and van der Wiele (1992) extracted three, Jang et al. (2006), Babakus et al. (1993) as well as Cronin and Taylor (1992) extracted a single dimension using the items of SERVQUAL. A five factor solution was concluded in Saleh and Ryan's 1992 study, yet the indicators loaded on different factors than theoretically expected ones. In conclusion, Babakus and Boller (1992, p. 265) have asserted that "the domain of service quality may be factorially complex in some industries and very simple and unidimensional in others", while claiming the number of dimensions to be extracted depended on the context of the study. As it is beyond the scope of this study, the different context and different factorial solutions achieved will not be further articulated.

The current study extracted a uni-dimensional factorial solution of SERVQUAL in line with the results of previous three studies mentioned above (Jang et al. 2006, Babakus et al. 1993, Cronin and Taylor 1992). As their data lent itself to a single dimension of SERVQUAL, Jang et al. (2006) argued that the respondents may be unable to differentiate subtle differences between sub-dimensions. The results suggested that customers evaluated their co-production partners on a single dimension of quality. The relationship between service quality and co-production motivation was positive as expected, and the quality of the service was the strongest indicator of customer's motivation to co-produce with a specific service provider. This finding mimics the results of previous empirical findings. Shamdasani et al.'s (2008) study has demonstrated that service quality was a strong indicator of perceived value, satisfaction, and continued interaction in SSTs. Similarly, Wu et al. (2012) have demonstrated that

service quality was the strongest determinant of satisfaction in co-production context. The overwhelming impact of service quality on motivation emphasizes the importance given to customer's evaluation of service provider's abilities and, once again, accentuates the fact that customer's motivation for engagement does not only rely on his/her own physical and mental inputs, aka operand and operant resources but also the abilities and resources of their counterparty. This finding strengthens the importance of the argued SDL trivet and the reason why necessary antecedents belonging to all parties need to be taken into consideration in co-production studies.

The second antecedent condition regarding what service-provider puts on the table to motivate customers to engage in co-production has been theorized as communication quality. Building on the work of Sharma and Patterson (1999), this study argues that timely and accurate flow of communication is essential for companies to build relationships with their customers. Consequently, it is argued that where there is no relationship in terms of communication, no motivation to commit resources to take on the job of co-production can exist on customer's part. Auh et al. (2007, p. 362) also emphasize the importance of communication in the sense that "communication also socializes customers with regard to the procedures and norms of the organization by helping them identify with a particular role within the organization, which also is important for effective co-production". Therefore, the importance of communication quality has been argued in the social sense of building bonds as well as on the more practical sense of defining roles. Following the reasoning argued, this study investigated the impact of communication quality on co-production motivation. Yet, the results showed that communication quality did not impact customer's motivation to co-produce over SSTs (H15 not supported). This result contradicts the findings of Auh et al.'s (2007) study, where they argue that communication quality is a strong indicator of co-production behavior. The results of this study, also, disagree with the findings of Wu et al. (2012) to a certain degree.

In the investigation of communication quality's impact on co-production satisfaction, Wu et al. (2012) have compared two different segments. Such distinction was based on the works of Dwyer et al. (1987) and Jackson (1985), where they argued that the relationship the customers have with their service providers ranged on a continuum

from relational to transactional orientations. Relational customers are defined as those customers who have long-term commitment to their service providers, whereas transactional customers are those who stay at arms-length without much commitment. Their involvement in the relationship may be on ad-hoc basis without any real attachment (Auh et al. 2007, Burnham et al. 2003, Garbarino and Johnson 1999). As Wu et al. (2012) compared the importance of communication quality on both segments on co-production satisfaction, their findings demonstrated that while communication quality impacts satisfaction for relational segment, the argued path for transactional segment was insignificant. This result suggests that customers who are in a committed relationship with the service provider rely on the quality of the communication provided by the company to form co-production satisfaction. Conversely, customers who take on the task of co-production on an ad-hoc basis do not express satisfaction through the quality of communication. Going back to Auh et al.'s (2007) study, the importance of relational segment can be emphasized as the context of their study was financial services, in which the relationships are rarely ad-hoc but mainly relational founded on trust and behavioral loyalty. Therefore, both studies' results reinforce the finding that the quality of the communication plays a role on co-production behavior or satisfaction for relational segment.

Interpreting the insignificant path between communication quality and customer's co-production motivation for the current study, it may be concluded that customer's regard their relationships with the airline companies on an ad-hoc basis not on relational commitment. Although the demographic information suggests that the online check-in passengers are heavy users of the system, with an average of over eighteen online check-ins per year, this information does not give any indication on switching behavior which may be expected as a consequence of an ad hoc relationship. However, it may be interpreted that check-in activity is a goal-oriented activity that each act is considered as separate and isolated connections with the service provider, thus not contributing to a long-term relationship building. Accordingly, it may be concluded that communication quality does not impact customers' co-production motivation on SST setting. However, this conclusion is reached with the reservation that future studies on this specific context should investigate the difference between customers belonging to airline's loyalty programs and customers who do not belong to the loyalty programs, in relation to

communication quality and motivation. This point is further discussed in future research suggestions.

6.4 SITUATIONAL FACTORS AS ANTECEDENT CONDITIONS FOR CO-PRODUCTION MOTIVATION IN SELF SERVICE TECHNOLOGIES

The central tenet surrounding the construct of co-production motivation is that motivation is a produce of antecedents belonging to the basic parties of the SDL trivet made of the customer, the company, and the service to be co-produced. Yet, it has been argued that in every context, different situational factors play a distinct role in the shaping of the customer's motivation. A solid foundation for this argument is Social Cognitive Theory as it asserts that customers are not directed by their individual differences but also by environmental and situational factors (Oyedele and Simpson 2007, Bandura 1986). Therefore, presence of other customers (Dabholkar and Bagozzi 2002), time needed to be spent at a specific environment (Gelderman 2011) and other specifics of the environment such accessibility of the location in terms of convenience (Wu et al. 2012) have been argued to effect customer's motivational and attitudinal impetus. This study, also, regards such factors to have impact on customer's co-production motivation. The results indicate that the relationships between situational factors and co-production motivation are in the same direction as theoretical expectations. The results of the path analysis show that access convenience and perceived waiting time have significant impact on co-production motivation (H17 and H18 supported). In other words, customers' motivation is positively influenced by the sense that the co-production option offers access convenience. Similarly, co-production motivation is positively related with the amount of waiting time compared to alternative service offering.

Access convenience has been associated with minimizing the time and effort of completing a task (Wu et al. 2012, Jones et al. 2003). In different contexts, access convenience has been studied in relation with customer satisfaction as well as behavioral intentions (Seiders et al. 2005, Andaleeb and Basu 1994). The impact of access convenience on switching behavior and customer retention has been established (Rust et al. 2004, Keaveney 1995). The use of the construct of access convenience in the context of SSTs has been limited to a single study of Wu et al. (2012). The findings of

their study suggested that location convenience did not have significant impact on repurchase intention in co-production setting.

Although the role of access convenience has not been established in co-production literature, there seems to be a sound theoretical justification for such inclusion. The inseparability of services inherently suggests that customers need to adjust their availability at the convenience of their service providers thus, causing inconvenience to customers in return. Grönroos had pointed out the significance of accessibility in late 1970s, right after Shostack (1977) broke services marketing free from marketing of goods. Grönroos (2007) citing his own article of 1978 argued that one of the most important aspects of services marketing was increasing the accessibility of the services as he argued the example of insurance vending machines. He (Grönroos 2007, p. 30) further stated

I believe that by applying the accessibility concept, service marketing has a chance of breaking free from the burden of the traditional distribution concept. Direct distribution will then by no means be the only way of making the service accessible to the consumers.

Similarly, according to Berry et al. (2002), this is the main reason why accessibility in terms of time and location has gained importance. Through access convenience the customers break free from the routine of the company and produce the offering where and when they see fit. Berry et al. (2002) specifically give the example of self-service offerings as they seek to support their notion to why emancipation of the customer in terms of time and location should be important to customers. They state (Berry et al. 2002, p. 7) “Access convenience is a primary reason for consumers to self-perform certain services. Self-service reduces consumers' dependence on service providers whose accessibility may be inconvenient.” As explained through conceptual framework, this study has argued that co-producing over SSTs offers convenience in terms of time and location which would in return strengthen customer's motivation to use such technologies. The findings of the study support this hypothesis and show that separating the making of the service from the domain of the company induces customer motivation to join the production process. Furthermore, this finding suggests that beyond the much needed SDL trivet argued through this study, other environmental and situational factors may need further attention.

Another determinant for co-production motivation in terms of situational factors is found to be perceived waiting time. According to Dabholkar and Bagozzi (2002) perceived waiting time represents customer's evaluation on the amount of time s/he will allocate between different options of service delivery. Authors state (Dabholkar and Bagozzi 2002) that when the waiting-in-line period of the traditional service offerings increases, customers tend to lean towards use of SSTs. Therefore, it has been argued in this study that as the waiting time of the traditional service delivery increases, the customers will have greater motivation to co-produce using SSTs. This reasoning is supported by the findings of Weijters et al.'s study (2007). The results of the study mentioned demonstrate a negative relationship between perceived waiting time and satisfaction for non-SST users. Furthermore, the negative effect of perceived waiting time is higher for users of SSTs compared to non-users.

The findings of the current study support the theoretical relationship proposed. Therefore, it is concluded that perceived waiting time has a positive impact on co-production motivation. This finding suggests that the customers will be more motivated to use SSTs to co-produce in cases which they perceive they will have to invest significantly longer time in an alternative service delivery form. Consequently, it will be reasonable to make sound suggestions on how perceived waiting time can be used by managers in different settings.

The final antecedent condition considered to influence co-production motivation was perceived crowdedness. According to Dabholkar and Bagozzi (2002, p.190), although perceived crowdedness may have positive impact on certain settings such as concerts and sports events, in most service settings, it is undesirable. The idea behind considering perceived crowdedness in relation to use of SSTs is simple. In situations where customers are subjected to crowds or crowded settings, they lean towards SST options to bypass the crowds. However, the results of this study indicate that there is no significant relationship between perceived crowdedness and co-production motivation (H19 not supported). A possible explanation for the insignificant relationship may be the context of the study. As discussed in previous sections, this study used online check-in system of an airline company as the context of the study. This assumes that the customer would be motivated to complete his/her own check-in through the technology

offered in exchange for eliminating the crowd in front of the check-in counter. Yet, in most airports, check-in counters are rarely the only place where the customer is subject to crowdedness. They are accompanied by crowds through different security checkpoints and documentation control desks. Therefore, beating the crowd may not have served as a strong determinant since they realize that almost all points at the airport are likely to be crowded.

The discussion on antecedent conditions needs to be concluded on an important note. One of the important goals of this study was to understand the underlying conditions that bred customer's co-production motivation. This was argued to be an important contribution of this study responding to the call for future research avenues by Meuter, Bitner, Ostrom and Brown (2005, p. 79).

This rich area of inquiry [SSTs] would benefit from studies in multiple contexts to determine what relevant antecedents increase consumer readiness and the differential influence of role clarity, motivation, and ability on trial in other high-customer participation settings.

Similarly, it was argued that limiting the formation of co-production motivation to customer's own operant and operand resources would be a significant oversight. Accordingly, this study has further discussed that customers would not only take a long and hard look at their abilities, knowledge, and mental capacities but also at different dimensions on what it is that was being co-produced (service-linked factors), whom they were co-producing it with (company-linked factors), and specific contextual conditions they were in during co-production (situational factors). The argument put forth was that co-production motivation would be impacted by a combination of factors that were grounded in the SDL trivet and the situational factors. The findings indicate that, in fact, SDL trivet exists in the sense that antecedent conditions for each leg (customer, service and company linked factors) are evident in customer's motivation to co-produce. Risk-taking capacity, resource capacity, need for interaction, optimism and discomfort of customer-linked factors, relative advantage, trialability and observability of service linked factors, service quality of the company linked factors, and access convenience and perceived waiting time of situational factors impact customer's co-production motivation.

6.5 CO-PRODUCTION MOTIVATION

Inclusion of the construct of motivation was argued to be an important theoretical contribution of this study as it has been rarely investigated in relation to co-production phenomenon regardless of its fit with the concept. On a very similar context to this study, Iacobucci has argued the importance of motivation as early as 1996 (p.32) through:

In Europe, airport concourses are littered with automatic ticket machines that you rarely see being used. These machines represent state-of-the-art technology that links into various airlines' central reservations systems and departure control systems. They offer an extremely cost effective ways to sell and check in for flights. So why do customers avoid them? Because customers do not see personal benefit in using the technology.

Previous studies have argued that there needed to be intrinsic and extrinsic drivers of motivation for customers to diverge from their customary practices to engage in co-production using SSTs (Eastlick et al. 2012, Meuter et al. 2005). Meuter et al. (2005) have used expectancy-valence theory to investigate motivation in SSTs context and concluded that intrinsic motivation did not predict trial. Building on the work of Meuter et al. (2005) in terms motivation, Eastlick et al. (2012) only included extrinsic motivation in their research model and showed that extrinsic motivation had a positive impact on attitude towards co-producing in SSTs.

Through this study, it has been argued that increased operand and operant resources of the customer, certain advantages that are attributed to the product to be co-produced, certain qualities of the co-production partner as well as situational factors mold into co-production motivation. Yet, the solid theoretical foundation of motivation lies on the premise that motivation is a combination of intrinsic and extrinsic expectations (Vroom 1964). While extrinsic motivation is driven by outside sources, intrinsic motivation cover the ground of self such as doing the activity for self-fulfillment or for simply pleasure (Staw 1977). As Sujana (1986) states, extrinsic and intrinsic motivations are not interchangeable but complementary. What this suggests is that a customer may have any combination of no, low, or high intrinsic and/or extrinsic motivation towards a phenomenon. Meuter (1999, p.62) explains this point simply by "total motivation level is determined by the combination of intrinsic and extrinsic motivation". Yet, besides the study of Meuter et al. (2005), the construct of motivation including its two dimensions

has not been tested in co-production literature. The results of Meuter et al.'s (2005) study suggested that extrinsic motivation was the determinant of trial in SSTs setting while intrinsic motivation's impact was insignificant. Relying on Meuter et al.'s (2005) findings, Eastlick et al.'s study (2012) only tested the effect of extrinsic motivation on attitude towards co-production and concluded that there was a positive relationship-the former impacting the latter.

Although Meuter et al.'s (2005) study findings highlighted the importance of extrinsic motivation as opposed to intrinsic motivation, Dabholkar (1996) and Bateson (1985) studies have toyed with the idea of intrinsic motivation under the rubric of enjoyment. Dabholkar (1996) measuring enjoyment with adjectives such as enjoyable, fun, interesting, and entertaining argued the theoretical roots of enjoyment in SSTs through the works of Dabholkar (1996), Davis et al. (1992), Holbrook et al. (1984), and Holbrook and Hirschman (1982) and asserted that customers valued the "fun" aspect of using SSTs which encouraged customers for usage. He further argued "Thus, for technology-based self-service options, we expect enjoyment (arising intrinsically from interacting with such options or from the novelty aspect) to be important to customers in evaluating such options" (Dabholkar 1996, p. 35). Although Dabholkar (1996) did not specifically use the term motivation, his explanation of enjoyment to a certain degree coincides with the definition of intrinsic motivation used within this study. This study defines intrinsic motivation as inner drives that direct behavior to achieve certain rewards, and Dabholkar (1996) uses enjoyment as the surrogate to explain such inner drives. The findings of his study concluded that motivation was a significant force that determined customer's behavior in choosing SSTs.

The consolidative and complementary nature of extrinsic and intrinsic motivation have directed the researcher of this study not to make the distinction between the two types of motivation originally. Yet, during the exploratory phase of the study, in-depth interview respondents were extremely specific about the different outer drives that directed them to use online check-in. These included opportunity to select a specific seat or specific meal, proceeding directly to the gate when they did not have luggage to check-in, directly crediting frequent flier miles to loyalty card, added convenience, and control over the process. Therefore, the set of indicators measuring motivation, inherently

included a set of items that specifically pointed to different types of motivation. During analysis stage, the items of extrinsic motivation, that were generated based on the findings of the exploratory phase of the study, did not meet the statistically satisfactory threshold levels sought. Therefore, the indicators of extrinsic motivation were excluded from this study.

Motivation, represented by the items belonging to the subdimension of intrinsic motivation explained over half of the variance in attitude towards co-production. As a result, the findings suggested that motivation had strong positive impact on attitude towards SSTs (H22 supported). This finding suggests, motivation is an important determinant of attitude formation in SSTs context. Consequently, emphasizing the antecedent conditions that build co-production motivation will directly impact customers' attitude towards co-producing over SSTs with their partner.

6.6 THEORY OF REASONED ACTION IN CO-PRODUCTION PROCESS

The established causal link between motivation and attitude towards co-production is important since it represents empirical proof that shaping a positive attitude towards SSTs can be realized through highlighting various drives. This findings inherently suggests that managers need to concentrate on various antecedent conditions to increase customer motivation to shape their attitudes.

Previous sections of this research have clearly stated that one of the major contributions of this research would be its goal to include and interpret its findings in light of already established and well recognized theories of marketing. To this end, the construct of motivation has been included in the study, being one of the most well-framed constructs in consumer behavior that lacked empirical evidence in SSTs context. In section three, another one of such theories was explained to be Theory of Reasoned Action (TRA) (Fishbein and Ajzen 1975). Bobbitt and Dabholkar, in their 2001 article, argued TRA to be one of the best known and supported attitudinal theories yet to be tested and interpreted in SSTs context. Although Davis et al. (1989) had defined TRA as a model “proven successful in predicting and explaining behavior across a wide variety of domains”, one of such domains had never included SST until today. Therefore, the inclusion of the causal link between attitudes, intentions and actual behavior is an

original theoretical contribution of this study that substantiates the operability of TRA in SSTs.

TRA (Fishbein and Ajzen 1975) explains individuals develop intention to engage in behavior towards which they have positive attitude. What this translates into for the current study is that customer's positive attitude towards co-producing over SSTs impact their intention to co-produce in the future, which, then, triggers their actual behavior of co-production. The findings support the causal link explained. The results of this study show that attitude towards co-production has a positive impact on co-production intention (H23 supported), and co-production intention has a positive impact on actual co-production behavior (H24 supported). Putting aside the domino effect proposed by TRA, the importance of attitudes and intentions have been established in the SSTs literature. Table 6.2 summarizes the studies that have used different motivational and attitudinal constructs, still falling short of providing evidence for TRA in SSTs context.

As indicated in Table 6.2, inclusion of attitudinal constructs in SSTs is common. Nevertheless, in order to claim that TRA is operative in SSTs context, the three constructs that constitute the reasoned action; attitude, intention, and behavior (use) must be present. To the best of the researcher's knowledge the research model of the current study is the first model that demonstrates the argued link between attitudinal constructs to conclude operability of TRA in this context.

This finding suggests a domino effect that is concluded with actual co-production behavior. Therefore, the research model represents the most comprehensive work to this day, which elaborates the co-production process starting with delineation of necessary conditions that ignite the process as well as stages the customer goes through that breeds actual co-production behavior.

Table 6.2: Selective list of empirical studies in SSTs with attitudinal constructs prepared by the researcher

Context	Antecedent conditions	Output variable(s)	Source
Self-check-out	Previous experience Technology anxiety Need for interaction Decisional control gained Belief on transfer of responsibilities Innovation characteristics	Motivation Attitude Future intention	Eastlick et al. (2012)
Self scanning through hand-held device	Usefulness Ease of use Reliability Fun Newness	Attitude Use	Weijters et al. (2007)
Self-diagnosis	Usefulness Ease of use	Attitude Intention to use	Lanseng and Andreassen (2007)
Mobile services	Expressiveness Enjoyment Usefulness Ease of use Normative pressure Behavioral control	Attitude Intention to use	Nysveen et al. (2005b)
Touch-screen ordering	Ease of use Performance Fun	Attitude Intention to use	Dabholkar and Bagozzi (2002)
Online retailing	Usefulness Ease of use Enjoyment	Attitude	Childers et al. (2001)

6.7 CO-PRODUCTION PROCESS OUTPUTS

Any attempt to delineate the process of co-production is an important one. However, ending the process with actual behavior is not enough because the companies are not in business in order to ensure customers perform certain behaviors but to profit. In fact,

one of the most basic and widely cited definitions of marketing reads “marketing is meeting needs profitably” (Kotler and Keller 2012, p.27). Accordingly, ending a model of co-production with actual behavior would say much less compared to one, pursuing the outputs that would generate future business for companies.

As important as it is to show that established theories of marketing such as TRA with its roots going back to 1975, are applicable to 21st century realities, another solid reason for the inclusion of actual behavior lies in the domain of future intention co-produce and co-creation of value. Etgar (2008), through his descriptive model, explains co-production outputs form the level of customer satisfaction as well as their future actions. Therefore, as important as it is to understand the necessary conditions that form actual behavior, it is equally important to understand the outputs that actual behavior breeds.

A major finding of this study is its support in explaining the role of perceived value between actual behavior and satisfaction. Holbrook (2006, p. 715) defines perceived value simply by “interactive relativistic preference experience”. Sheth et al.’s (1991) distinction between different sorts of perceived values has been utilized in this study to understand the mediating effect of perceived value on the relationship between actual behavior and satisfaction.

The theoretical underpinnings of the proposed relationship between value and satisfaction are well established in the value literature. Eggert and Ulaga (2002, p. 114) assert there are strong interactions between the two constructs. They advise the constructs to be treated as distinct, yet complementary (Eggert and Ulaga 2002). Consequently, establishing the relationship between value and satisfaction is not only important for co-production literature but also a contribution for the value literature.

The results of this study indicates that emotional value, social value, and convenience value partially mediates the relationship between actual behavior and satisfaction (H26a, H26c and H26e partially supported).

This finding suggests that actual behavior has a positive impact on satisfaction. However, when the perceived emotional, social or convenience value is present, satisfaction is realized through the mediating effect of perceived value and the direct effect of actual behavior is attenuated. Consequently, it can be argued that without

amplifying various values derived from the co-production process, satisfaction can be realized by the customer. Yet, when the customer is aware that s/he has benefited from different sets of values, the direct effect of actual behavior diminishes, and the sequence of effects is altered. This result implies that actual behavior significantly influences perceived emotional, social, or convenience value which in return increases satisfaction.

It should be noted that inclusion of perceived value between satisfaction and actual behavior increases our ability to explain the variance in satisfaction. The mentioned increase is over 350 percent for emotional value, 250 percent for social value and over 500 percent for convenience value. These results suggest perception of value is an important element during the realization of co-production process output, -satisfaction for this study. Therefore, amplifying different values may be advantageous for SST companies, which wish to increase the satisfaction levels of their customers with the co-production process.

The importance of satisfaction and its relation to future intentions have been argued previously. Wu et al. (2012) have studied the impact on satisfaction on repurchase intentions in co-production context and demonstrated satisfaction's impact on repurchase intention. Similarly, Dong et al.'s (2008) findings showed that satisfaction was a significant determinant of future intention during collaborative process. The result of this study echoes the findings of the previous studies, as it demonstrates that satisfaction has a very strong impact on future intention to co-produce. This finding suggests that as a customer realizes satisfaction through various sorts of perceived values, his/her intention for future engagement is positively affected. Therefore, it can be concluded that when satisfaction with co-production process is achieved, the customer will continue to invest his/her resource in the process of co-production, hence, increase their "worth" in the eyes of the company. This result may also, be argued in terms creating co-production loops with the customer, which eventually suggests increasing customer equity (CE) and customer lifetime value (CLV) (Richard and Jones 2008).

Vavra (1997) states that marketing has become customer-centric especially starting from 1960s. The customer-centric point of view presented itself through emphasis on building long-term relationships as opposed to hit-and-run transactions (Storbacka

1994). The importance given to building relationships with the customers surfaced through relationship marketing (Morgan and Hunt 1994). At the heart of the relationship marketing lies the challenge of loyalty, which is constantly fostered by the parties involved. Yet, fostering such relationships is argued to be costly and sometimes done in the expense of company profitability (Berger and Nasr 1998). A promising exercise in the land of relationship marketing has presented itself through customer relationship management, whose “disappointing results” are well documented in related literature, argues Richard and Jones (2008, p. 120). The major reason for the less than satisfactory results for the companies is explained by Berger and Nasr (1998, p.18) as,

Relationship marketing is costly. It might not pay to maintain long-term relationships, at least not all the time and not with all customers. Customer with low switching costs and short time-horizons might not be financially attractive to the firm.

Therefore, choosing the customers and creating terms that the relationships can be built on is considered to have utmost importance for companies. The results of this study can be discussed through the commitment of the customers to the process. As the customer invests his/her own resources in the making of the service, the argued barriers in terms of switching costs are increased. Richard and Jones (2008, p, 122) define CLV as the net present value of each customer. CLV breeds CE, because CE is calculated through “discounted sum of each customer’s CLV less any on-going investments required to maintain customer relationships” (Richards and Jones 2008, p. 122). In order for this study to conclude, collaboration during production increases CLV, hence CE, it would need to comment on the investments made in order to keep each customer in the cycle, which goes beyond the scope of this study. However, as argued in the previous sections of this research, Anand in 2011 asserted that the expected increase in SSTs offerings would be over 80 percent until the year 2015. Kinard et al. (2009) have translated this claim into real-life figures as they argued the SSTs industry was worth over 1.7 trillion only in North America. These views suggest that the diffusion of SSTs are inevitable. Drucker, who had envisioned such change as early as 1954 (p. 37), had explained the importance of keeping up with innovations while explaining it through customer retention:

There is only one valid definition of business purpose: to create a customer. ...It is the customer who determines what the business is. ...Because it is its purpose

to create a customer, any business enterprise has two-and only these two- basic functions: marketing and innovation.

Innovation is costly; yet since no company can deny the dynamics of the market, such investments are usually argued to be justifiable (Rust et al. 2004). Rust et al. (2004, p. 112) explain the argued link between investments and CLV and CE:

Marketing is viewed as an investment that produces an improvement in a driver of customer equity. This leads to improved customer perceptions which result in increased customer attraction and retention. Better attraction and retention leads to increased CLV and CE.

Once the investment is made by the company, the customer and the service to be co-produced, the satisfaction bred through the process serves as the much needed igniter of future co-production processes. Accordingly, a co-production process serves as the base unit of future customer attraction and retention. The satisfactory co-production episodes serve as the foundation needed to embark on new journeys of collaborative production with the same partner. The loop created translates into increased CLV and inherently CE. Accordingly, relying on the theoretical views argued, the results of this study demonstrate customers future intentions can be explained through satisfactory episodes of collaborative production.

Another important finding of this study taps into relatively under-studied concept of co-creation of value. The results of this study demonstrate that satisfaction with the co-production process positively impacts customer's attitude towards co-creation of value (H28 supported). It is important to delineate the potency of this finding.

Through Churchill's (1979) paradigm of generating better scales in marketing, this study has constituted a valid and reliable scale that measures customer's attitude towards collaborative creation of value in-use. Furthermore, this study is the first study that has demonstrated an empirical link between co-production outputs and co-creation of value, which has been argued conceptually throughout last decade.

Vargo and Lusch (2008a, p. 8) through the foundational premises of SDL have asserted that "the customer is always the co-creator of value". This foundational premise suggests that value cannot be embedded in the offerings and served to the customers dressed as products or services, but it can only be created with mutual efforts of corroborating parties during use stage (Vargo and Lusch 2008a, Vargo and Lusch

2004a). This view has been adopted by various marketing scholars as they argued that since extraction and consumption of value took place during usage, there needed to be some sort of interaction after point-of-exchange that could be translated into collaboration of parties. One of the important contributions to this discussion came from the founders themselves as they (Vargo and Lusch 2008a) argued co-production to be optional subset of non-optional co-creation of value. What this view has suggested is that if the marketing world was any close to explaining marketing phenomenon as a process of creating value, we needed to move away from generating different forms of discrete transactions because exchange inevitably took place for centuries; yet, not all exchanges had created value. Therefore, the value did not lie in the exchange *per se*, but what the customer deduced from whatever it was that was being exchanged in terms of value during consumption. This was the obvious reason behind the proposition that the value-in-use was superordinate of value created during production (Grönroos 2008, Vargo and Lusch 2008a, Lusch and Vargo 2006). The main argument of this position served as the igniter for this research. Grönroos (2008, 2006) probed since the stage of value in-use where the real value was extracted and consumed took place after point of exchange, where the customer was the only active party, and how could it be called co-creation of value? Who was creating, extracting and/or consuming value collaboratively with the customer after point of exchange? Why and how could a party be invited to customer's sphere by the customer to co-create value with them?

Payne et al. (2008) argued that companies, which would approach their customers with superior value propositions would enrich in-use experience, and serve as an active party during value extraction and consumption. This view supported Prahalad and Ramaswamy's (2004a) approach as they suggested that the companies could only penetrate customer's sphere through continuous interaction of dialog after point of exchange. In short, the conceptual ground for co-production and co-creation phenomena has suggested that as important as co-production was in itself, which created offerings that fit better with the unique needs of the customer, it could not be the end in itself, because value could never be delivered but could only be created during usage. Consequently, the companies should seek ways to accompany their customers to the stage, which value was actually created and consumed. This way the company would serve as the facilitator to increase the quantity and quality of the value derived. In order

to fulfill the role of facilitator the company would propose superior value propositions, showing various ways of extracting increased levels of value. Yet, the value propositions could only get across the borders to customer's sphere if the customer heard and listened. As explained previously, customer's attitude towards co-creation of value represents individual's evaluation of realizing value in-use by interactive process of learning (ways to extract and consume value) together through continuous dialog. Therefore, attitude towards co-creation of value represents customer's views on increasing the value that may be extracted from the offering during consumption. Although measuring attitude towards co-creation of value may be important to interpret customer's views on co-creation process, it is equally important to try to explain attitude towards co-creation of value in relation to co-production process. An empirical link that ties satisfactory co-production processes to positive attitude towards co-creation of value represents an even more important justification for companies that are to make such an immense investments on co-production processes. In other words, such result would demonstrate that a satisfactory co-production process would serve as the entry pass to customer's sphere, where the company would be able to establish the bond needed to be the facilitator during the value creation process.

The findings of this study demonstrate that co-production satisfaction, which is the ultimate output of the process itself, has a positive impact on customer's attitude towards co-creation of value as hypothesized (H28 supported). This result suggests that there is a link between co-production outputs and value co-creation; in that, once the customer is satisfied with co-production, his/her attitude towards evaluating the superior value propositions offered by the company to enhance the value created is increased. Therefore, co-production not only represents a process, which the parties come closer to produce an offering with mutual commitment of resources and efforts, but also a process that serves as the initiator of sharing of the rewards after point of exchange. This means, customer's engagement in co-production results in inviting the company to extract and consume the value together by seeking new ways to increase value realized. This is argued to be the longest journey that a company can have with its co-production partners. This journey had been previously argued by Etgar (2008, p. 97) as he asserted that "consumption activities are not separate form production activities, but connected to them." The findings of this study suggest that satisfactory co-production processes

are ways to link production activities to consumption activities. As argued previously, the results show that successful co-production episodes are reasons for customers to select certain companies to embark on future learning with them to enable collaborative value creation and consumption.

In order to test for the discussed results, one important obstacle faced was the lack of a robust measure of co-creation of value. Once, attitude towards co-creation was defined, the researcher's attempt to locate scales that would measure the described phenomenon was ineffectual. Therefore, relying on Churchill's (1979) paradigm for developing measures, the said scale was generated by the researcher.

The conceptual foundation of the scale relied on literature review and the focus group findings. The focus groups participants implicitly stated the importance of communication with the company in order to gain added value. The added value was referred in the context of additional benefits realized in consumption of the total offering that could be possible through company's involvement. Furthermore, those benefits, that the customer not even thought about or realized was possible, could solely be generated by the expertise of the company. In light of the literature reviewed and the findings of the focus group discussions, comprehensive pool of items that would measure attitude towards co-creation of value scale was generated and tested for validity and reliability.

The comprehensive pool of 15 items included the customers' attitude towards utilizing company's superior value propositions to increase the value they derived from the offering, being in continuous dialog with the company in order to get the chance to explain sought value-in-use, and engaging in collaborative effort to increase value that could possibly be extracted from the offering. The results of the exploratory factor analysis (EFA) and confirmatory factor analysis(CFA) on the main data showed that six indicators of the original 15 loaded considerably higher on a single factor. The short version of the scale showed a substantial increase in level of reliability as well as variance explained. The short version of six items covered the domain of the construct as it included items related to:

- a. taking advantage of the company's expertise,

- b. co-creating the use experience,
- c. receiving support from the company to increase the overall value,
- d. receiving various superior value propositions,
- e. exchanging ideas to increase value-in-use, and
- f. continuous dialog to increase the use experience.

Therefore, a six item scale that measured attitude towards co-creation of value covered the domain of the intended meaning and was tested, and demonstrated applicability for the context under study.

One of the distinct contributions of this study is the inclusion of moderators between antecedent conditions and co-production motivation since theory indicates various constructs may specify the conditions under which the theorized effect may vary in direction and in strength (Holmbeck 1997). It has been argued that role clarity and enjoyment represents such conditions where realization of such moderators may strengthen the relationship between proposed antecedent conditions and motivation.

The findings of the study indicate that role clarity strengthens the positive relationship between optimism and co-production motivation (H20f supported). This result suggests that there is positive relationship between being optimistic about technology and the feeling that it gives people flexibility and control over their daily lives with co-production motivation. In other words, customers' positive beliefs about technology motivate them to use technology to co-produce. Furthermore, when customers feel high role clarity on the task they are to perform, such impact is strengthened. Therefore, the positive slope between optimism and co-production motivation is stronger with the existence of role clarity. Role clarity has the same effect on the relationship between relative advantage and co-production motivation. This suggests that belief about the co-produced offering, possessing relative advantage compared to other forms of servicedelivery, influences customers motivation to co-produce. Yet, when the customer is highly clear about the role s/he is asked to play during the production of the offering, the said relationship is strengthened (H20j supported).

Another interesting effect that is reported through the findings is the moderating effect of enjoyment between antecedent conditions and co-production motivation. Enjoyment is defined as the reinforcement that activity provides in its own right. In short, it is doing the activity for no other reason than *the kick* the customer gets out of the activity alone. The results indicate that enjoyment strengthens the positive relationship between risk-taking capacity and co-production motivation (H21b supported). As discussed through literature review, risk-taking capacity is unique to the current study in co-production and SSTs context. Constructs related to risk have been examined before, usually under the rubric of perceived risk in relation to attitudinal constructs in SSTs context (Eastlick et al. 2012, Shamdassani et al. 2008, Meuter et al. 2005). However, the degree of risk absorption or propensity, as defined through this study, has never been included before. Yet, from a practical point of view, it makes perfect sense that an individual, who has high degree of tolerance for uncertainty or who is willing to compromise his/her resources for uncertain consequences, will have higher degree of motivation if s/he enjoys doing the activity itself. The results indicate that individuals whose enjoyment levels are high, the already positive relationship between risk-taking capacity and co-production motivation is strengthened.

Enjoyment, also, moderates the negative relationship between need for interaction and co-production motivation. This result inherently suggests that there is a negative relationship between need for interaction and motivation to co-produce using SSTs. In other words, individuals, who are in need of personal relationship during the making of the service, will be less motivated to co-produce since they would be missing on the interaction aspect. However, when the individuals enjoy the activity of co-production, the negative impact of need for interaction on co-production motivation is dampened. In other words, need for interaction's negative effect on co-production motivation is weaker when there is high enjoyment of the activity (H21d supported).

The other two paths, that enjoyment moderates, are the impact of observability and the impact of perceived waiting time have on co-production motivation (H21m and H21r supported). This result indicates that there exists a positive relationship between observability and co-production motivation, meaning when the results of the co-production is visible to others, it has a positive impact on motivation to use the system.

However, such impact is enhanced if the activity is enjoyed by the user. Similarly, enjoying the activity strengthens the positive relationship between perceived waiting time and co-production motivation. In other words, while the perception of having to wait a longer period of time to check-in, as opposed to using the online check-in system, motivates the customer to co-produce over the technological system, the level of motivation increases, if the individual actually enjoys the activity.

Another interesting discussion point is the results breeding from demographic variables. As it can be recalled from previous sections, the relationships in the model have been tested when controlling for the demographic variables of age gender, marital status, income and education. The results showed that demographic variables' addition of explanatory power was very modest. In other words, it was not possible or adequate to try to explain co-production phenomenon through demographics, since much of the explanation was owed to theorized predictors. Although very little variance was added through the inclusion of demographic variables, all paths that were formerly significant remained significant with the inclusion of demographic variables (H29b, H29c, H29d, H29f, H29g, H29j, H29l, H29o, H29p, H29q, H29s, H29t, H29u, H29v, H29w and H29x supported)

These findings will be further discussed in terms of managerial and theoretical implications in the next section.

7. CONCLUSION

Service Dominant Logic (SDL), regarded as the next frontier towards the formation of a general theory of marketing (Bolton 2006, Vargo and Lusch 2006, Vargo and Lusch 2004a, Vargo and Lusch 2004b), has been drawing the attention of marketing scholars and practitioners alike. Yet, Randall (2007, p. 6) argues that SDL, to this day, lacks “a theoretical model, operationalized constructs and theoretical relationships between constructs”. This study is addressed to close the gap in literature, regarding conceptualization and operationalization of the elements of the co-production process, which is accepted to be the cornerstone of SDL (Etgar 2008). Furthermore, it seeks to link co-production process’ outputs to co-creation value, in order to understand conceptually proposed link between co-production and co-creation of value (Grönroos 2008).

The next section concentrates on the theoretical implications of the study delineating the ways the theoretical gaps have been addressed. Next, managerial implications bred through the findings of the study have been discussed. The third section concentrates on the theoretical and managerial limitations of the research. Finally, the study is concluded with suggested future research avenues.

7.1 THEORETICAL IMPLICATIONS OF THE STUDY

This research strives to extend our existing knowledge on co-production process and its relation to co-creation of value. To this end, several theoretical implications will be discussed.

One of the research questions of this study inquired about the nature of the co-production process. Through the discussion of the findings, it can be concluded that co-production process is a process of collaborative production that is ignited with various antecedent conditions that belong to the parties of the basic SDL trivet as well as situational factors. The antecedent conditions serve as the igniter of the process and various stages are carried out to realize co-production outputs. The conceptual framework of this research had pointed out that co-production could only be labelled as

a process if, in fact, it was ignited with combination of antecedent conditions proposed. Once the importance of each antecedent condition was established, the research had to demonstrate that the findings supported theoretical framework proposed. If in any of the stages proposed, the link was broken, then the findings would be interpreted as a caption of a co-production process rather than a continuous process as suggested. In other words, although marketing literature as well as literature related to consumer behavior have suggested a domino effect between antecedent conditions and motivation (Eastlick et al. 2012, Meuter et al. 2005), motivation and Theory of Reasoned Action (TRA) (Eastlick et al. 2012, Lanseng and Andreassen 2007, Weijters et al. 2007, Bruner II and Kumar 2005, Nysveen et al. 2005a, Dabholkar and Bagozzi 2002, Childers et al. 2001), TRA and perceived values (Pura 2005), perceived values and satisfaction (Eggert and Ulaga 2002), and satisfaction and future intentions (Eastlick et al. 2012, Shamdasani et al. 2008), it is only through a co-production model such as the current one, all the antecedent conditions, cognitive, affective, and conative constructs were included to describe co-production as a continuous phenomenon (Eggert and Ulaga 2002).

One of the major theoretical contribution of this study is its attempt to delineate the co-production process, which has been imperative for studies in co-production and co-creation areas that built upon SDL, besides from the descriptive model proposed by Etgar (2008). This study represents the first co-production model that starts with antecedent conditions deemed necessary to initiate the process, explains different stages that the customers to go through to realize co-production and finally describes the outputs of the co-production process. In doing so, several important issues need to be pointed out.

Prior studies have attempted to empirically examine a portion of a co-production process on a limited basis. However, a comprehensive approach that takes all parties, as well as the service to be co-produced into account has been lacking. By examining the antecedent conditions of the customer, the company and the service to be co-produced conjunctionally, this study theoretically establishes the essential elements of the “SDL trivet” conceptually proposed previously (Payne et al. 2008). In the proposed model, the antecedent conditions for the customer, for the company and for the service to be co-

produced are studied simultaneously to understand their impact on customer's motivation to engage in co-production. This study concludes that customers' motivation to co-produce rely on different qualities of the parties that constitute the basic trivet. Customer's risk-taking capacity, resource capacity, need for interaction, optimism and discomfort regarding technology are the factors that impact their motivation. Relative advantage, trialability and observability of the service to be co-produced also induce customers' motivation to take part in the process of co-production. Customers evaluate companies on the basis of their service quality while they build their motivation to co-produce. Finally, access convenience and perceived waiting time are the situational factors that impact customer's co-production motivation.

The second research question of the study inquired about the different stages that the customer went through in order to achieve co-production outputs. The stages are confirmed as hypothesized. The process of co-production consists of five distinct stages as described by Etgar (2008) as presented in Figure 1.1. The first stage is development of antecedent conditions. The second stage is the development of co-production motivation. Third stage is formation of positive attitude towards co-production and formation of intention to co-produce, respectively, where the customer calculates the cost and benefits of co-production to assess if s/he should engage in actual behavior. Once the benefits are calculated to be higher than the costs as the result of the third stage, positive intentions are translated into actual behavior (Fishbein and Ajzen 1975). Activation is the fourth stage of the process, where the customer actively engages in co-production. Once the behavior is performed, customer realizes different values to form satisfaction with co-production process and the results are realized. This is the fifth and final stage of the process which is labelled as generation of outputs and evaluation of the results. The co-production process satisfaction serves as the ultimate output, which also serves as the processor for future intention to co-produce and positive attitude towards co-creation of value with the specific co-production partner. Therefore, the process does not only have explanatory power over its immediate output –satisfaction but also over generation of long term outputs of the process in terms of future intentions and attitude towards co-creation of value.

The third, fourth and fifth research questions are intervening queries that challenge the factors effecting customers in each of the five stages delineated above. The framework proposed asserts that SDL trivet covers the most basic form of parties that can realize co-production process conjunctionally. In other words, in order to form the first stage, various qualities of each leg of the trivet need to serve as the antecedent conditions. The importance of this proposition lies on the domain that a party, or a special innovative nature of a co-produced service offering by itself, cannot serve as the igniter of the process. This is one of the reasons why, previous studies as valuable as they are, failed short of interpreting co-production phenomenon as a process. Through delineation of all parties' antecedent conditions as well as situational factors, this study was able to explain factors effecting various stages of the process.

The results showed that antecedent conditions of all parties as well as the situational factors had an impact on co-production motivation. Customer's risk-taking and resource capacity, their optimism towards technology as well as their decreased need for interaction and discomfort with technology were first set of effecting factors of this stage. Other factors included customers' view on quality of the service offered by the company, relative advantage of the service to be co-produced compared to traditional service offerings and trialability of the co-produced service before committing to co-production. The findings, also, demonstrated that convenience in access and perception of decreased waiting time effected the ignition of the process under the rubric of situational factors.

This study fills several gaps regarding to the antecedent conditions that are being discussed. Prior studies have established the importance of perceived risk especially in technology related contexts (Meuter et al. 2005, Featherman and Pavlou 2003). Yet, this study argues that in addition to the type and the level of perceived risk, the motivational and attitudinal decisions are based on the level of a person's risk absorption. Therefore, this study have investigated propensity towards risk-taking to understand, whether increased tolerance towards risk had impact on engaging collaborative production using self-service technologies. This study being the first one to investigate the customer's risk-taking capacity's impact on motivation to co-produce have demonstrated that as

customer's propensity towards risk increase, they will be more motivated to co-produce through SSTs.

Another important theoretical contribution comes in the form of resource capacity. Although, the importance of resources have been studied since Smith (1776/1994) within the boundaries of economics and marketing, and the distinction between operant and operand resources have been established since Constantin and Lusch (1994). As a result, no marketing study to this day has ever measured the degree of operand resource ownership, since no scale that measures operand resources have been proposed. One of the important theoretical contributions of this study and proposing and establishing a reliable scale that measures ownership of operand resources that can be used in future studies of SSTs. Through the scale of resource capacity, ownership of operand resources that will be invested in co-production process are investigated. As proposed, increased ownership of operand resources are a clear indicator of customer motivation. Although, this finding seems to fairly straightforward, since no person can use SSTs without having necessary technological resources, theoretically defined as operand resources, to do so, the attention given to customers' operand resources have been lacking. One plausible explanation for the lack of interest is Service Dominant Logic's (SDL) increasing interest in operant resources. Operant resources are defined as those intangible and dynamic resources that produce the desired effect when employed on operand resources (Vargo and Lusch 2004a). SDL considers expertise, ability and mental capacities to be the most important operant resources in arguing, it is only through the implementation of operant resources on the operand ones, the value would emerge (Vargo and Lusch 2008a). Yet, a customer must have operand resources to begin with in order to employ such expertise, knowledge or mental capacities to create desired effects. Consequently, although the level of expertise considered is important, possession of tangible resources (speaking strictly from Goods Dominant Logic perspective) need to be measured to understand the impact of operand resources to the process under investigation.

Another important finding related to customer linked factors was the established cause and effect relationship between need for interaction and co-production motivation. Results indicated that as customers need for interaction increased they were less

motivated to co-produce in SSTs context. Although this finding echoed some of the previous studies' findings, explaining the discrepancies surrounding need for interaction is a theoretical contribution of this study.

Eastlick et al. (2012) have investigated the need for interaction's impact on extrinsic motivation in grocery store self-checkout context and reported an insignificant relationship. The authors' explanation for the discordant findings was that since the customers have been in direct contact with grocery store employees during their shopping experience, they had the opportunity to fulfill their need for interaction prior to self-check-out. This view is supported by Gelderman et al.'s (2011) study findings, since they presented the users of self-kiosk machines in an international airport were in less need for interaction compared to non-users. This study explained the discrepancy in findings in terms of service outlets to conclude, the amount of interaction that the customer needs vary according to service setting. Settings, in which there are other service cues available through the servicescape may serve as the interaction needed by the customer. This finding strengthens Bitner's (1992) views on the impact of physical settings' have on the interaction between parties. Consequently, the inclusion of the construct of need for interaction in theoretical models may need to depend on not only the general context of the study, but also on the specifics of the environment.

While including the commonly studied construct of expertise capacity, this research has relied on the findings of previous studies which have presented the importance of previous experience (Eastlick et al. 2012, Reinders et al. 2008, Meuter et al. 2005), ability (Meuter et al. 2000) and self-efficacy (Oyedele and Simpson 2007, Dabholkar and Bagozzi 2002). Yet, in line Kim et al.'s (2012) findings, the relationship between expertise capacity and motivation was found to be insignificant. In order to shed light on the gap in findings, Alba and Hutchinson's (1987) work on expertise have been utilized. From theoretical point of view it is argued that what customers interpret as having expertise may be quite different than the theorization of the construct. Therefore, in line with Alba and Huntchinson's (1987) conceptualization, proper measurement of expertise may have to include the dimensions of; simple repetition, cognitive effort, ability to analyze information, ability to elaborate information and ability to remember information.

Final set of customer linked factors included mental enablers and mental inhibitors in the form of technology readiness. Parasuraman's (2000) widely accepted index of Technology Readiness Index (TRI) was used to measure customer's propensity towards technological means.

TRI (Parasuraman 2000) is an index that measures person's propensity towards using technology in everyday tasks. Mental enablers of innovativeness and optimism, mental inhibitors of discomfort and insecurity originally make up the overall readiness index. From a theoretical stand point, there are two issues related to the dimension of insecurity. Insecurity is defined as "distrust of technology and skepticism about its ability to work properly" (Parasuraman 2000, p. 311). It has been argued that the construct name of skepticism represents the intended meaning better, thus, has been used to explain the dimension. Second, just as previous studies conducted in the past in the SSTs context (Gelderman et al. 2011, Liljander et al. 2006, Taylor et al. 2002), the indicators of skepticism did not load on their parent dimension as suggested by Parasuraman (2000). This study represents corroborating theoretical evidence that although TRI might be used through parceling the exogenous items where the different parcels may represent a set of enablers and a set inhibitors, the utilization of the four dimension as separate should be handled with care.

The second set of antecedent conditions that were argued to impact customer's motivation to co-produce over SSTs were factors related to the service. Previous studies, which have concentrated on service linked factors, have utilized innovation characteristics to explain the innovative nature of the service and its impact on the process. As argued by Etgar (2008), qualities of the service to co-produced need to bear specific characteristics for customers to assume responsibility, since co-production represents a major divergence from customers' customary practices and such characteristics are presented through the dimensions of Roger's (1995) innovation characteristics. Yet, only the dimensions of relative advantage (Eastlick et al. 2012, Weijters et al. 2007), compatibility (Liao and Lu 2008, Meuter et al. 2005) have been previously studied to explain innovation characteristics' impact on customers' motivational or attitudinal constructs. Through this study, the observability was established as a major determinant of co-production motivation.

The conceptual underpinnings of this study lies on the premise that while building motivation to co-produce over SSTs, customer not only considers factors linked to self and the service to be co-produced, but also factors related to the company which is to become their co-production partner. As explained in previous sections, the company linked factors have been investigated through service quality and communication quality.

In order to measure the quality of the service provider, Parasuraman et al.'s (1988) SERVQUAL has been utilized. SERVQUAL is a multidimensional measure that is argued to have five separate dimensions that conjunctionally make up the measure of service quality. This study in line with several previous studies have encountered a frequent theoretical shortcoming of the measure used. The factorial structure of the SERVQUAL items produced a single factor solution. Unidimensional factorial structure has been reported by Jang et al. (2006), Babakus et al. (1993), and Cronin and Taylor (1992) previously.

The recurring theme throughout this research was the importance given to the co-production process. The term process suggests that the defined co-production path needs to be made of several distinct stages. The process takes off with the established antecedent conditions and the customer moves through different stages to create co-production outputs. One of the distinct theoretical contributions of this study is the inclusion of motivational and attitudinal constructs as described by consumer behavior theorists (Fishbein and Ajzen 1975, Vroom 1964) to explain the process customers go through to realize co-production outputs. Through the inclusion of such constructs, several theoretical contributions are established.

First, the inclusion of motivation is distinct to this study. Although, Meuter et al. (2005) have argued that customers having more options than ever before, should be sufficiently motivated to choose an offering or an alternative form of service delivery, as opposed to other, the lack of empirical data on motivation, made it impossible for SDL researchers to conclude motivation's distinct role on the process.

Second, although it has been established in the literature that the underlying reason for the adoption or usage is Theory of Reasoned Action (TRA) (Fishbein and Ajzen 1975),

the trio; intention, attitude and actual behavior in research models are absent. In other words, the current research is the first model that includes the construct of motivation to examine its impact on TRA concepts, looking for the domino effect argued by Fishbein and Ajzen (1975). Through the findings of the current research, the constructs and reasoning behind TRA has been used and tested for the very first time in co-production context. The findings indicate sufficient support for the usage of TRA in future studies.

In development of motivations, which is considered to be the second stage, factors of intrinsic motivation seem to be in the forefront. Although the research model of this study has not made the distinction between extrinsic and intrinsic motivation, including indicators belonging to both types, the items of intrinsic motivation is the set of factors that affect the forming of the second stage. This result suggests that inner drives are the prevailing factors effecting motivation.

The third stage, namely calculation of co-production cost and benefits to form attitudes and intentions to ignite activation, has drawn much attention in literature. Although, some scholars have argued that only the construct of attitude to be the determinant of actual usage in SSTs (Eastlick et al. 2012, Weijters et al. 2007), others have proposed intention to be the determinant of actual behavior (Kleijnen et al. 2007, Venkatesh and Speier 1999). Yet, the results of this study have demonstrated that positive attitude towards SSTs impacts customer's intentions to use. Therefore, both factors are the affecting factors of the third stage, realizing the co-production activation.

Finally, once the activation is realized, actual co-production behavior breeds process satisfaction. The interpretation of mediating factors asserts emotional value, social value, and convenience value mediate the relationship between activation and satisfaction. In other words, the aforementioned values are the effecting factors of the final stage and by their inclusion the model has better power to explain co-production process' output of satisfaction. Accordingly, it is possible to conclude that actual behavior directly influences satisfaction with co-production process, but it is only through the inclusion of perceived values as mediating variables, we have the power the explain bigger portion of customer satisfaction with the co-production process.

The sixth research question probes the link between successful co-production episodes and future intention to produce as it has been conceptually proposed that a satisfactory co-production process has an impact on future intention to co-produce. The findings suggest that satisfactory co-production process is a very strong determinant of future intention to co-produce, explaining over 70 percent its variance. This finding indicates that breeding satisfaction with co-production processes is not only the end in itself, but it, also, serves as a surrogate for customers future behaviors. It should be noted that the explanatory power of satisfaction has on future intention to co-produce is the strongest relationship reported through the findings of this study.

Finally, the last research question of this study inquires about the link between co-production consequence of satisfaction and attitude towards co-creation of value with the co-production partner. The importance of this research question lies in the domain of searching the link between co-production and co-creation of value. As it can be recalled from the previous sections, an important gap in SDL literature was the empirical support for the conceptually proposed link between co-production and co-creation of value (Grönroos 2008, Payne et al. 2008, Vargo and Lusch 2008a, Vargo and Lusch 2004a). Although theory suggested for co-production and co-creation to be nested concepts (Grönroos 2008, Payne et al. 2008, Vargo and Lusch 2008a, Vargo and Lusch 2004a), no previous studies have investigated such proposition.

The results of this study suggest that customers' satisfaction with co-production has a direct positive impact on their attitude towards co-creation of value with their co-production partners. In other words, a satisfactory co-production episode serves as the antecedent condition for customers to invite their co-production partners to their value extraction and consumption spheres and seek new ways to increase the value they derive from the offering through continuous dialog. This represents the ultimate form of relationship formed between parties that starts even before the production of the service and evolves through different stages in order to create, increase and consume value in-use. This finding makes the importance given to point of exchange obsolete since the process explained is continuous one, starting with the making of the offering and, yet, not ending with collaborative value creation since the customer has the intention to start the whole process with the same partner from the beginning. This result has important

implications for marketing theory and for scholars' who attempt to define marketing as a process rather than discrete exchange episodes (Bagozzi 1975). The results of this study may shed light on one of the important research questions posed by Bagozzi in his 1975 (p. 39) article as he concluded "why do some marketing exchanges persist in ongoing relationships and others fall apart?" The results indicate customers' have positive intention for ongoing relationship with their partnering companies through successful co-production processes.

As argued previously, the aim of this research was not only to delineate the co-production process, but to link the alleged process' consequences to co-creation of value. Through such link, this study strived to show support for Vargo and Lusch (2009, p. 230), as they asserted co-production to be "an optional subset of the non-optional value co-creation". Therefore, the conceptually proposed link between co-production and co-creation of value has been sought.

The first challenge of this task was that, there was no established scale for the construct of "attitude towards co-creation". Therefore, another major theoretical contribution of this study is the establishment of the valid and reliable scale of "attitude towards co-creation value". Once the scale was established, the results of the hypothesis testing demonstrated that, the satisfactory co-production process had a positive impact on attitude towards co-creation of value. Therefore, the current study was the first study to measure attitude towards co-creation of value and successfully link co-production outputs to co-creation of value.

This section discussed the findings of the study in light of the theoretical relationships put forth. The findings indicated that every leg of the basic SDL trivet carries crucial indicators that motivate customers to engage in co-production in SSTs. It has also demonstrated that the relationships posed by TRA is applicable to the context of co-production. Furthermore, it has established that perceived value that breeds satisfaction causes customer's future intention to co-produce with the same co-production partner. Moreover, the findings indicated that a successful co-production episode can count for invitation to customer's sphere to support customers in creation of value in-use.

7.2 MANAGERIAL IMPLICATIONS OF THE STUDY

On the basis of the theory proposed and the theoretical contributions discussed, the aim of this section is to offer some practical and tactical suggestions to managers in order for them to successfully understand the co-production process and its impact on co-creation of value.

The findings of the study suggest that distinct qualities of the customer, innovative nature of the service to be co-produced, as well as the distinct qualities of it as perceived by the customer are the factors that affect customer to develop co-production motivation. The findings establish that the risk-taking capacity is a major determinant of co-production motivation. Hence, one of the important tasks of the managers is to develop tools to increase the risk-taking capacity of their customers. This may be carried out through measuring perceived risk and delineating the nature of the risk involved. Through such investigation, the ways to increase the level of customers risk absorption may be further studied. Moreover, providing evidence that the perceived risk may be shared with the service provider and there may be ways to recover losses regarding co-production processes may increase customers' risk-taking capacity which in return will elevate their co-production motivation.

Another important determinant of co-production motivation is customers' resource capacity. The findings suggest that the customers' motivation partially relies on the operand resources to be invested in the process. Put simply, as customers have increased level of operand resources, they will be more motivated to co-produce. This result suggests, while the companies making immense investments in the static and tangible resources to present SST options, the customers also must possess different operand resources to make use of such technologies. Explaining the resource capacity in the context of this study, which is online check-in, it is only through the operand resources of the customer in the form of a desktop computer, a laptop computer or a mobile device such as a tablet or a smart phone, the customer will be able to undertake his/her part in the task. In light of this finding, it would be in companies' best interest to support customers' procurement of necessary resources. Developing and enhancing customers' resource capacity may be viewed as a necessary business practice that may be used to further motivate them to engage in co-production.

The construct of need for interaction is found to be an important determinant for co-production motivation. As customers need for interaction decreases, they realize higher motivation levels to engage in co-production through SSTs. The examination of results of different studies which have used the construct of need for interaction have suggested that customers need for interaction has an important effect on motivation in settings, where the customer and the company are at arm's length (Lovelock 1983). In settings where the company and customer share the servicescape or where there are service cues available to customer, customer's need for interaction does not impact their co-production motivation. This finding suggests, different service cues may be used to replace interaction in order to decrease the actual need for contact with the service employee.

The results of the final set of customer linked factors, namely technology readiness, showed that having a positive attitude towards technology in general and the feeling that it gives people increased control and flexibility in everyday tasks is an important determinant of co-production motivation. This suggests, emphasizing such qualities of technology and the role they play in co-producing over SSTs is crucial. Managers should consider communicating advantages technology and its importance in completing everyday tasks to increase customers' co-production motivation.

While customer's optimism regarding technology in general impact their motivation to co-produce using SSTs, their view on their own lack of abilities to use technology negatively impacts their co-production motivation. Therefore, regardless of the absolute amount of ability they may possess, customers' motivation to co-produce using SSTs are negatively affected with self-distrust. This finding suggests that managers should pay attention to activities that increase customers' perceptions of own abilities to use technology. As customers become more optimistic towards their abilities and how they can employ such abilities to complete technology related tasks, such optimism will positively impact their motivation to become co-production partners. Consequently, it is in company's best interest to not only increase the amount of customers' technology related abilities, but also to communicate how such abilities may be converted into completing tasks.

The results of the study show relative advantage of the service to be co-produced has the highest impact on co-production motivation among service linked factors. In other words, the antecedent conditions that motivate the customer to engage in co-production with his/her resources are the produce of how advantageous the customer thinks the co-produced service is, compared to other forms of service delivery. This finding suggests, emphasizing the relative advantage of the co-produced service will greatly motivate customers to use SSTs and engage in production activities with the service company.

One of the important igniters of motivation is found to be trialability. Customers who are willing to co-produce with companies tend to be more motivated if they have the opportunity to try the service to be co-produced before committing to the process with their resources. Therefore, managers are advised to create platforms where customers can engage in production activities on trial basis. The opportunity to try the process will encourage the customers to become partners with companies during production stage. Similarly, observability is an important determinant of co-production motivation. This result suggests customers favor opportunities in which the results of the co-production process may be viewed by fellow customers. Accordingly, making the outcomes of the co-produced offering visible, or physically locating platforms of co-production on common grounds should be prioritized by the managers.

Service quality is found to be important determinant of customer's co-production motivation. As a matter of fact, the results of this study reveal, it is the number one antecedent condition which has the highest impact on customer motivation. This result suggests, customers are more motivated to invest their operant and operand resources to company processes when they perceive the company meets higher quality standards. Thus, increasing the quality of the service not only has an immediate effect on direct service provisions, but it also has an impact on customer's views on the selection process as they decide on companies that they will engage in collaborative production.

Regarding the situational factors, this study concludes, offering convenience in terms of time and location increases customers' motivation. As argued by Berry (2002) previously, convenience is found to be an important reason for customer to perform certain activities. Consequently, production of the service can no longer exist solely on the domain of the company in terms of location. Furthermore, the production process

needs to be broken free from company's predetermined routines. In other words, making production of the service provision available through various means and contexts will increase customers' motivation to engage in collaborative production. Put simply, customers no longer accept to make themselves available at the convenience of the company, but opt for options that give them freedom in terms of location and time.

The most important reason for companies to exist is not to motivate their customers but to profit. In order to profit, they need to ensure customers perform certain behaviors on a regular basis. Consequently, establishing the root of motivation is not an end itself, but only a beginning in terms of understanding the path the customer will follow. The results of the study suggest, motivation is an important determinant of actual behavior. Managers, who will use the delineated antecedent conditions, will be able to motivate their customers to co-produce over SSTs, which in return will translate into actual co-production behavior and inherently future intention of engagement. Therefore, the path from motivation to future behavior resembles bones of a domino deck, and the antecedent conditions are the initial force that is needed to knock down the first bone. Once motivation is heightened, the customers likely to engage in actual behavior. Once the behavior is realized, the perceived values will elevate the level of satisfaction.

An important finding of this study is understanding the roles of different values on the path to customer satisfaction. Managers are advised to amplify the social, convenience, and emotional values to increase the level of satisfaction. In other words, as the co-produced offering possesses greater convenience for the customer, they are said to be more satisfied. Similarly, social value is an important determinant of customer satisfaction. Customer satisfaction increases as they perceive that their self-image is heightened by actively contributing to the process of co-production. The sense of approval from the audience is an important reason for satisfaction. Therefore, making the process of the co-production or the co-production outputs visible to fellow customer groups will increase customer satisfaction as they will realize greater social approval.

Investing in co-production requires justifiable gains. In other words, sustainability is a priority as the companies embark in such immense process investments. Through the findings of this study, it has been established that satisfactory co-production processes lead to elevated levels of future intention to co-produce on customers' part.

Accordingly, a co-production process will serve as the base unit for customer retention. Equally importantly, a satisfactory co-production episode will open the gates of customers' sphere for the companies which then will have a chance to accompany their co-production partners to their use stage.

Therefore, co-production not only represents a process, which the company and its customers engage in a collaborative activity with the mutual commitment of different resources, but a longer commitment they realize as extended value from the offering is co-produced. During this journey, customer is expecting and willing to take advantage of company's expertise to increase value-in-use and in return committing to value creation process with feedbacks. This result for managers represent an opportunity in the sense that the successful co-production episodes are reasons for customers to select certain companies to embark on future learning with them to enable collaborative value creation and consumption.

7.3 LIMITATIONS OF THE STUDY

As with any research, this research bears several limitations that are articulated in this section.

The problem with almost all studies which is accessibility to the complete sampling frame was not possible for this study also. Although an airline with the biggest share in terms of routes flown, passengers carried and fleet was chosen in order to overcome potential bias issues, since non-probability sampling technique was used, the generalization of the findings should be made with care (Churchill 1999).

Another limitation of the study was the survey design, which was cross-sectional. It should be noted that cross-sectional survey design only breeds a snapshot of the phenomenon under investigation which, again, jeopardizes the generalizability of the results (Malhotra 2010).

Third limitation of this study is that the passengers of a single airline company was used as the source of data collection. As argued above, although the airline chosen was the largest airline in terms of different parameters, collecting data from different passengers of different airlines would contribute to validity and generalizability of the findings.

Another limitation of the study was the result of the linearity test, which concluded that five of the 28 paths were either cubic, quadratic or inverse, as opposed to being linear or sufficiently linear. Although no remedies were applied, since all five paths were found to be significant, the results should be handled with care.

An important limitation of the study was the fact that two of the scales used in this study have been developed by the researcher for the purpose of measuring constructs in question. Consequently, although the initial pool of items was generated as a result of the careful analysis of the exploratory phase, only through replicate studies in different contexts the validity and reliability of the scales will be confirmed (Churchill 1999).

It should be noted that co-production is novel and unique area of study. The context chosen to investigate the co-production phenomenon was online check-in system of an airline company. While it was relatively more practical to conduct a research on online check-in context, due to its wide adoption, online check-in may not be a complex enough context to test some of the causal relationships such as the one between expertise capacity and co-production motivation. Accordingly, one must assume, the causal relationships demonstrated might vary in different SST contexts. Therefore, additional contexts that are simpler and more complex compared to online check-in should be utilized to increase generalizability.

Finally, situational factors considered for this research covers the domain of the specific context chosen for this study. Although convenience in time and place might hold true for many different SST contexts, replicative studies with diverse types of SSTs should consider context specific situational factors.

7.4 FUTURE RESEARCH AVENUES

It is common to have extensive future research avenues in under-studied areas of research. In this sense, co-production presents a major opportunity.

Firstly, as described in the limitations section of this study, the research had several shortcomings. In order to overcome such limitations, future studies should be designed in a way that will establish relatively more generalizable results. Accordingly, future studies are advised to use different contexts of SSTs across different industries.

Second, stemming from the limitations of this study, once again, use of probability sampling would overcome issue of sampling bias. Accordingly, the generalizability of the findings will be achieved.

This research was founded on the basic Service Dominant Logic (SDL) trivet. In other words, only the antecedent conditions related to the customer, the company and the service to be co-produced were taken into consideration, alongside with situational factors. However, the markets of today are much more complex than the argued basic trivet. Akaka et al. (2012, p. 15) conceptually argue the importance of service ecosystems and their importance to the value creation process through:

Service ecosystems are relatively self-contained self-adjusting systems of resource integrating actors connected by shared institutional logics and mutual value creation through service exchange. This view...broadens the view of value cocreation beyond the firm-customer dyad and draws attention toward social contexts (i.e. institutions) that frame value cocreation and exchange.

Vargo and Lusch (2011) explain service ecosystems that inherently create, extract, and consume value are complex systems. The service ecosystem view emphasizes “the importance of shared institutions, social norms or rules of the game that influence and are influenced by interaction an exchange among actors” (Akaka et al. 2012). This view offers the foundation of SDL is much more complex than the basic trivet argued throughout this study. Although this research presents a starting point for further investigation, future studies should not only consider expanding their domains to cover different actors that have a place in the value chain, but also regard social relationships among those actors across various contexts.

Another interesting future research topic would be the exploration of co-production process in business-to-business context. Going back to the service ecosystem view, it is quickly noticed that the value chain is combination of institutions, customers, and customer groups. Accordingly, in order to hit the right note on ecosystems discussion, business-to-business applications of co-production could be explored. In doing so, the realities of the new world in terms of technological advancements (Kotler et al. 2010) deserve further attention.

An interesting point to pursue would be the relationship between co-production satisfaction of the customer and overall satisfaction with the company. Such finding

would contribute greatly to marketing literature through explaining the importance of co-production process within the bigger picture. A study that investigates the impact of co-production satisfaction on overall satisfaction with the company would mark the importance of generating collaborative production process for companies.

Finally, future research may further develop a co-production model by the inclusion of extended outcome variables. One possibility would be the inclusion of customer loyalty. Establishing the link between co-creation and customer loyalty would support the foundation of this research to further demonstrate, co-creation represents an opportunity for all parties involved for long term commitment with their resources.

It may be argued that through the inclusion of such outcome variables companies will “reconceive the definition of the marketplace, redraw the boundaries of the firm, redefine its value propositions, and rethink about how to compete” (Hamel and Prahalad 1994, p. 61). This research, in line with the viewpoint of Hamel and Prahalad (1994), suggests future research avenues may include defining the marketplace from the service ecosystems perspective, positioning the firm dynamically in the marketplace, competing through value propositions collaboratively generated with the value chain actors.

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