

**REPUBLIC OF TURKEY
BAHCESEHIR UNIVERSITY**

**FINANCIAL INCLUSION AND ITS IMPACT ON
GROWTH AND INEQUALITY: FOCUSING ON
EUROPE AND CENTRAL ASIA (ECA)**

PhD Dissertation

ASLI CEREN ÖZHAN

İSTANBUL, 2018

**REPUBLIC OF TURKEY
BAHCESEHIR UNIVERSITY**

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

**FINANCIAL INCLUSION AND ITS IMPACT ON
GROWTH AND INEQUALITY FOCUSING ON
EUROPE AND CENTRAL ASIA (ECA)**

PhD Dissertation

ASLI CEREN ÖZHAN

Dissertation Advisor: DR. ÖĞR. ÜYESİ AYŞE ALTIOK YILMAZ

İSTANBUL, 2018



**REPUBLIC OF TURKEY
BAHÇEŞEHİR UNIVERSITY
GRADUATE SCHOOL OF SOCIAL
SCIENCES**

01/06/2018

We hereby recommend that the dissertation prepared under our supervision by **Aslı Ceren ÖZHAN** entitled “**Financial Inclusion and Its Impact on Growth and Inequality: Focusing on Europe and Central Asia (ECA)**” be accepted in partial fulfillment of the requirements for the Doctor of Philosophy Business Administration.

Dr. Öğr. Üyesi Ayşe Altıok YILMAZ

Thesis Supervisor

Recommendation concurred in:

Committee Members

Prof. Dr. Aslı YÜKSEL

Prof. Dr. Aydın YÜKSEL

Prof. Dr. Murat AKBALIK

Prof Dr. Ümit EROL

Approved:

Program Coordinator

ACKNOWLEDGEMENTS

I would like to dedicate this dissertation to my mother, Muzaffer Erdoğan, who has been a great inspiration in my life. Without her encouragement, trust and perseverance, this would just be a dream. I would like to express my sincere gratitude to my supervisor, Asst. Prof. Ayşe Altıok Yılmaz for her continuous support, guidance and motivation throughout all stages of this thesis. I am very grateful and appreciative of the support of my Thesis Committee Members, Prof. Dr. Aslı Yüksel and Prof. Dr. Murat Akbalık. I would like to thank them for their feedback and valuable comments throughout this process. I am very grateful to my husband, Hüseyin Özhan for his incessant support and his profound faith in me. I would like to express sincere thanks to my father, Dr. Cengiz Erdoğan and to my sister Irmak Erdoğan for always being there for me. Finally, I would like to extend my deepest gratitude to the meaning of my life, my daughter, Mira Ayşe Özhan.

İstanbul, 2018

Aslı Ceren Özhan

ABSTRACT

FINANCIAL INCLUSION AND ITS IMPACT ON GROWTH AND INEQUALITY FOCUSING ON EUROPE AND CENTRAL ASIA (ECA)

Aslı Ceren Özhan

PhD in Accounting and Finance

Dissertation Advisor: Asst. Prof. Dr. Ayşe Altıok Yılmaz

June 2018, 88

The dissertation explores the connection between financial inclusion and two imperative macroeconomic notions of growth and inequality. Financial inclusion is defined as the access to and use of financial services. After narrowing down the definition, it then measures financial inclusion by using indexation technique. A major contribution of this study is the development of a measure of financial inclusion via formation of three indices, namely financial access index, firm-level and household-level financial usage indices. These three indices capture different aspects of financial inclusion, which is comprised of access to financial services by both households and firms in addition to effective use of these services. Based on Global Findex database and the Enterprise Survey database collected by the World Bank, Financial Access database collected by the IMF, the study introduces measures of household-level and firm-level inclusion, with placing ECA in a historical and cross-country perspective. By using Panel and OLS regression analysis, it analyzes the impact of financial inclusion on two important macroeconomic variables, namely growth and inequality. Moreover, it focuses particularly on the ECA region and analyzes the dynamics in the region. The study aims at documenting the status of financial inclusion in ECA, while shedding light on the impact of financial inclusion on growth and inequality. It concludes that, in line with the contemporary literature, financial inclusion enhances growth and reduces inequality with better access to resources to finance both consumption and investment. According to the dissertation's findings, the positive impact of financial inclusion on growth is significant in the ECA region.

Keywords: Financial Inclusion, Economic Growth, Inequality, Europe and Central Asia

ÖZET

FİNANSAL KAPSAMA VE FİNANSAL KAPSAMANIN AVRUPA VE ORTA ASYA'YA ODAKLANARAK BÜYÜME VE EŞİTSİZLİK ÜZERİNDEKİ ETKİSİNİN İNCELENMESİ

Aslı Ceren Özhan

İşletme Doktora Programı

Tez Danışmanı: Dr. Öğr. Üyesi Ayşe Altıok Yılmaz

Haziran 2018, 88

Tez, finansal kapsama ve iki belirleyici makroekonomik gösterge olan büyüme ve eşitsizliğin bağlantısını inceler. Finansal kapsama finansal hizmetlere ulaşım ve finansal hizmetlerin kullanımı olarak tanımlanmıştır. Tanımı daralttıktan sonra, tez, finansal kapsamayı endeksleme tekniği kullanarak ölçmektedir. Bu çalışmanın en önemli katkısı finansal kapsamayı ölçmek için üç endeksin (finansal erişim endeksi, şirket bazlı ve hanehalkı bazlı finansı kullanma endeksleri) oluşturulmasıdır. Bu üç endeks finansal kapsamanın hanehalkı ve şirketlerin finansal hizmetlere ulaşımı ve bu hizmetlerin kullanımını içeren farklı boyutlarını kapsar. Bu çalışma, Dünya Bankası tarafından hazırlanan Global Findex veritabanı ve Enterprise Survey veritabanı ve IMF tarafından hazırlanan Financial Access veritabanını kullanarak, hanehalkı ve firma bazından finansal kapsamayı ölçmek için yollar gösterirken; Avrupa ve Orta Asya bölgesini tarihi ve ülkeler arası karşılaştırmalı bir perspektife oturtur. Panel ve OLS regresyon analizleri kullanarak, finansal kapsamının iki önemli makro veri olan büyüme ve eşitsizlik üzerindeki etkilerini analiz eder. Ayrıca, Avrupa ve Orta Asya bölgesi üzerinde yoğunlaşarak, bölgedeki dinamikleri inceler. Bu tez, Avrupa ve Orta Asya bölgesin içinde bulunduğu finansal kapsamayı gösterirken, finansal kapsamanın büyüme ve eşitsizlik üzerindeki etkisine de ışık tutar. Güncel literatürle uyumlu olarak, finansal kapsamanın tüketim ve yatırım için kaynaklara ulaşımın finansmanı sayesinde büyümeyi artırdığı ve eşitsizliği azalttığı sonucuna varılmıştır. Tezin bulgularına göre finansal kapsamanın büyüme üzerindeki etkisi Avrupa ve Orta Asya bölgesinde anlamlı çıkmıştır.

Anahtar Kelimeler: Finansal Kapsama, Ekonomik Büyüme, Eşitsizlik, Avrupa ve Orta Asya

CONTENTS

TABLES	viii
FIGURES	ix
ABBREVIATION.....	x
SYMBOLS	xii
1. INTRODUCTION	1
2. LITERATURE REVIEW	5
2.1. DEFINITION OF FINANCIAL INCLUSION AND INDEX FORMATION	5
2.2. INDEX FORMATION AND ANALYZING GROWTH, INEQUALITY AND STABILITY	11
2.3. WORLD BANK ECA STUDY.....	27
3. DATA AND METHODOLOGY	34
3.1. DATA.....	34
3.1.1. Composition of the Index	34
3.1.1.1. Global index	34
3.1.1.2. Enterprise survey	35
3.1.1.3. Financial access survey	37
3.1.2. Methodology of the Index.....	38
3.2. METHODOLOGY	40
3.2.1. Panel Data Analysis	41
3.2.2. Cross-country Ordinary Least Squares (OLS) Estimation.....	49
4. FINDINGS	53
4.1. PANEL REGRESSIONS	53
4.2. OLS REGRESSIONS.....	58
4.2.1. Household-level Growth Regressions.....	58
4.2.2. Household-level Gini Regressions	60
4.2.3. Firm-level Growth Regressions.....	62
4.2.4. Firm-level Gini Regressions	67
4.3. ECA FINDINGS.....	70
4.3.1. Household-level Financial Inclusion	70
4.3.2. Firm-level Financial Inclusion	77
4.3.3. Access to Financial Institutions.....	84

5. CONCLUSION AND RECOMMENDATIONS.....	86
REFERENCES	89
APPENDICES.....	95
Appendix-1: Countries included in the 2014 Global Findex Database	96
Appendix-2: Global Findex Questions.....	97
Appendix-3: Countries included in the 2013 Enterprise Survey	101
Appendix-4: Enterprise Survey Questions.....	102
Appendix-5: Countries included in FAS database	107
Appendix-6: List of FAS Indicators.....	108
Appendix-7: Household-level Global Findex Index Results	110
Appendix-8: Firm-level Index Enterprise Survey Index Results	112
Appendix-9: Financial Access Index Results.....	115

TABLES

Table 2.1 Composite index variables (Amidžić).....	9
Table 2.2 Construction of the financial development index	17
Table 2.3 Financial inclusion index.....	23
Table 2.4 Benchmarked ECA financial development indicators	29
Table 2.5 Index indicators.....	31
Table 3.1 Composition of indices.....	39
Table 3.2 Descriptive statistics of dependent variables	44
Table 3.3 Descriptive statistics of independent and dummy variables.....	45
Table 3.4 Hausman test (GDP per capita dependent variable)	47
Table 3.5 Hausman test (GINI dependent variable)	47
Table 3.6 Unit Root test	48
Table 3.7 Correlation matrix (correlations)	49
Table 3.8 Correlation matrix (pairwise correlations).....	49
Table 3.9 Correlation matrix (correlations: 2011).....	51
Table 3.10 Correlation matrix (correlations: 2014).....	51
Table 3.11 Correlation matrix (correlations: 2006).....	51
Table 3.12 Correlation matrix (correlations: 2009).....	51
Table 3.13 Correlation matrix (correlations: 2010).....	52
Table 3.14 Correlation matrix (correlations: 2013).....	52
Table 3.15 Heteroskedasticity	52
Table 4.1 Panel data regression for GDP per capita.....	53
Table 4.2 Panel data regression for Gini Coefficient.....	54
Table 4.3 OLS regression for GDP per capita (FINDEX 2011)	58
Table 4.4 OLS regression for GDP per capita (FINDEX 2014)	59
Table 4.5 OLS regression for Gini Coefficient (FINDEX 2011).....	61
Table 4.6 OLS regression for GDP per capita (Enterprise Survey 2006).....	63
Table 4.7 OLS regression for GDP per capita (Enterprise Survey 2009).....	64
Table 4.8 OLS regression for GDP per capita (Enterprise Survey 2010).....	65
Table 4.9 OLS Regression for GDP per Capita (Enterprise Survey 2013).....	66
Table 4.10 OLS regression for Gini Coefficient (Enterprise Survey 2006)	68
Table 4.11 OLS Regression for Gini Coefficient (Enterprise Survey 2009)	69

FIGURES

Figure 4.1 ECA countries household index	72
Figure 4.2 Regional household index	73
Figure 4.3 ECA Findex: holding an account.....	74
Figure 4.4 ECA Findex: borrowed from a financial Institution.....	74
Figure 4.5 ECA Findex: saved at a financial institution.....	75
Figure 4.6 ECA Findex: credit card usage.....	76
Figure 4.7 ECA Findex: debit card usage	76
Figure 4.8 ECA firm-level index.....	77
Figure 4.9 Regional firm-level index.....	78
Figure 4.10 ECA firm-level index: firms with bank loan or line of credit	79
Figure 4.11 ECA firm-level index: firms with savings or checking account.....	81
Figure 4.12 ECA firm-level index: firms identifying access to finance as a major constraint.....	81
Figure 4.13 ECA firm-level index: firms using banks to finance investments	82
Figure 4.14 ECA firm-level index: firms using banks to finance working capital	83
Figure 4.15 ECA access to financial institutions (FAS Index- 2014 and 2015)	84
Figure 4.16 Regional access to financial institutions	85

ABBREVIATION

AE	: Advanced Economies
ATM	: Automated Teller Machines
BCP	: Basel Core Principles
BIS	: Bank of International Settlements
CEMAC	: Central African Economic and Monetary Community
ECA	: Europe and Central Asia
EM	: Emerging Markets
EU	: European Union
FA	: Factor Analysis
FAS	: Financial Access Survey
FD	: Financial Development
FIA	: Financial Index of Access
FID	: Financial Index of Development
FIE	: Financial Institutions' Efficiency
FMA	: Financial Markets' Access
FMD	: Financial Markets' Development
FME	: Financial Markets' Efficiency
GDP	: Gross Domestic Product
GDI	: Gender Development Index
GFDD	: Global Financial Development Database
GMM	: Growth Mixture Modeling
GNI	: Gross National Product
HDI	: Human Development Index

HPI	: Human Poverty Index
IFI	: International Financial Institution
IMF	: International Monetary Fund
LAC	: Latin America and Caribbean
LIDC	: Low-income Developing Countries
MFI	: Microfinance Institution
ODC	: Other Depository Corporations
OECD	: Organisation for Economic Co-operation and Development
OLS	: Ordinary Least Squares
SME	: Small and Medium-sized Enterprises
SSA	: Sub-Saharan Africa
UNDP	: United Nations Development Programme

SYMBOLS

d_i	: Dimension index
A_i	: Dimension's actual value
MIN_i	: Dimension's minimum value
MAX_i	: Dimension's maximum value
n	: Number of observations
FI_i	: Financial index for dimension i
GR_{it}	: Growth of country i at time t
$GINI_{it}$	: Income inequality of country i at time t
$GINI_{it}$	: Income inequality of country i at time t
FAF_{it}	: Financial access index
FIH_{it}	: Household-level financial inclusion index
FIF_{it}	: Firm-level financial inclusion index
IRS_{it}	: Interest rate spread
$MCAP_{it}$	: Market capitalization to GDP
$MTURN_{it}$	: Stock market turnover ratio
β	: A vector of parameters to be estimated
ε_{it}	: Error term
ECADummy	: Measure of not whether country i belongs to ECA or not
CRISDummy	: Measure of not measure of whether time t is 2008 or not

1. INTRODUCTION

Financial inclusion has become a very popular topic in the recent years particularly after the 2008 financial crisis. It has displayed an increasing trend in many countries worldwide and its degree varies extensively from region to region. To analyze financial inclusion, it is very important to define it properly in a quantifiable manner.

Numerous definitions of financial inclusion have been proposed. The World Bank highlights the concept of financial inclusion which ranges from “access and use of services provided responsively and sustainably” to “delivery of financial services at affordable costs to disadvantaged and low-income segments of society”. Financial inclusion is described as “the access to and use of formal financial services by households and firms” in line with Sarma’s definition (Sarma 2008).

Financial inclusion stands for access of households and firms to beneficial and reasonably priced financial products and services which are in line with their necessities. These could be financial transactions, transfers, savings, and loans. The first step for achieving financial inclusion is the access to a financial account given that it enables households and firms to store their wealth and to transfer and to receive payments.

Financial inclusion can also be defined as the access to and household- level and firm-level utilization of formal financial services. Only financial access is not sufficient to define the financial inclusion given that access without any usage does not explain financial inclusion. Therefore, in this study, to measure financial inclusion, the definition has been narrowed to cover access and usage.

There are two main indicators to measure financial inclusion: access and usage indicators. Access indicators display how deep the financial services’ outreach is. These include the branch or ATM network and their penetration levels. Usage indicators measure the clients’ utilization of financial services. These include how frequently the products/ services are used over a certain period (calculated by balance of average savings, amount of transactions for each account, amount of electronic payments).

Access indicators are captured by supply-side data. Supply-side data surveys give information for the formal financial institutions either directly from them or via financial regulators. The data contain information on geographical access (location of branches), network or utilization of products and services. Supply-side data can be collected regularly given that there are formal and regulated providers of this data. Its cost base is low compared to the demand-data surveys. Usage indicators are captured by demand-side data. Demand-side data surveys give information about users of financial services (households and firms) collected by conducting surveys of household and firms. Users' financial needs are captured by these surveys (either met or unmet), also the survey results point out to encountered barriers while looking for formal financial services and products. It should be noted that demand-side data and supply-side data are complementary and both should be used to evaluate financial inclusion in a holistic approach.

Measuring financial inclusion has been very challenging at both country and regional level. This study uses both supply-side and demand-side data to measure financial inclusion. Majority of the literature starting in 1970s uses the ratio of private credit to GDP, stock market capitalization as a proxy to financial inclusion. A contribution of this study is the development of a measure of financial inclusion via formation of three indices, namely financial access index, firm-level and household-level financial usage indices. These three indices capture different aspects of financial inclusion, which is comprised of access to financial services by both households and firms in addition to effective use of these services.

Even though there is a deep interest from the policy makers, studies on the macroeconomic impact of financial inclusion has been limited. The reason behind this was mostly the lack of sufficient macro-level data pertaining to financial inclusion. The aim of this dissertation is to contribute to the literature by studying the macroeconomic relevance of financial inclusion with an emphasis on Europe and Central Asia ("ECA")¹ countries. This study examines the linkages of financial inclusion with economic growth

¹ "Europe and Central Asia ("ECA") includes Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Georgia, Kazakhstan, Kosovo, Kyrgyz Republic, Macedonia, FYR; Moldova, Montenegro, Poland, Romania, Russian Federation, Serbia, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan according to World Bank Group classification." As per World Bank's definition.

and inequality. The study will analyze financial inclusion in three main sections: index formation, regression analysis and qualitative analysis of the ECA region.

Lately, ECA displayed a noteworthy progress pertaining to financial inclusion. Region's well-advanced microfinance sector and common usage of wage accounts are the success signs; however low savings rates and high levels of suspicion for the formal financial system are cause of concern for the policy makers in the region. As shown in the contemporary literature, financial inclusion enhances growth and reduces poverty and inequality with better access to resource necessitated to finance both consumption and investment. This study aims at documenting the status of financial inclusion in ECA, while shedding light on the impact of financial inclusion on growth and inequality.

The benefits of financial inclusion could be mainly revealed in ECA where both poverty and inequality persist to be high, saving rates are low and most underbanked adults are excessively women, poor, from remote areas, living in Central Asia. Account penetration is under 5 percent of the population in Kyrgyz Republic, Tajikistan, and Turkmenistan. Women are 25 percent less likely than men to have a formal account, with the major gender gaps in Albania, Bosnia and Herzegovina, Kosovo, and Turkey.

The study aims at measuring financial inclusion with the formation of three indices. Similar indices were formed by using similar approaches from the literature. The aim of this study is to quantify financial inclusion and to examine the relationship between financial inclusion and growth and inequality, after controlling for financial structure indicators (both covering financial markets and financial institutions). The intention is to decide if financial inclusion has an impact on growth and on inequality with a particular focus on the ECA region.

The remainder of the study is organized as follows. The subsequent section places this study's analysis in the framework of previous literature. The following section describes the complex concept of financial inclusion and explains the methodology including the index formation. The subsequent section looks at the effects of financial inclusion on growth and inequality via regression analysis. This section also includes a qualitative

analysis of financial inclusion for ECA countries. The final section concludes and discusses the ways to improve the analysis.



2. LITERATURE REVIEW

In the literature, both definition of financial inclusion and index formation to define financial inclusion have been extensively discussed. Studies of causes of financial inclusion either focused on particular regions or covered all countries. In this section, first, definition of financial inclusion and index formation will be discussed; then literature looking at financial inclusion's impact on growth, stability and income equality will be presented. Finally, a recent World Bank ECA Study will be reviewed.

2.1. DEFINITION OF FINANCIAL INCLUSION AND INDEX FORMATION

Financial inclusion literature has different concept explanations. The notion of financial inclusion attracted a mounting interest from the academia. Numerous studies described the concept by referring to financial exclusion instead linking it to a wider context of social inclusion. Sinclair (2001) indicated that the notion of financial exclusion was the incapability to access essential financial services while Leyshon and Thrift (1995) defined it as the processes which serve to preclude some social groups and/or persons from accessing the formal financial system. Similarly, Carbo et al. (2005) defined financial exclusion as the incapacity of some groups in accessing the financial system.

On the other hand, Government of India's definition of financial inclusion lies on the basis of creating a system that guarantees/ensures access by exposed groups (including low income ones) to financial services with (i) acceptable credit conditions and (ii) with an affordable cost, in a timely manner. Rajan (2014) signifies that financial inclusion encompasses the deepening of financial services for those people with limited access as well as extension of financial services to those who do not have any access. Furthermore, financial inclusion is directly defined by Amidžić, Massara, and Mialou (2014) and Sarma (2008). The former describes financial inclusion as an economic state where persons and corporates have access to rudimentary financial services.

Other studies have results that certainly could have significant policy implications with regards to increasing the level of financial inclusion. For instance, Burgess and Panda (2005) found that the new bank branch openings have significantly impacted alleviating poverty in rural India. Meanwhile, Allen et al. (2013) explored the factors behind the financial development and inclusion amongst African countries. Particularly, Brune et al.

(2011) conducted experiments in rural Malawi examining how the lives of the poor were improved by access to formal financial services pertaining to saving instruments.

Although it appears that there is a consensus on the definition of financial inclusion, there certainly is no standard way of measuring it. Hence, existing studies offer differing measuring techniques of financial inclusion. As an example, Honohan (2007 and 2008) constructed an indicator measuring access to finance by taking into account the overall adult population in a country with access to financial institutions. For countries with existing data on financial access, the composite indicator is formulated by utilizing household survey data. For the countries which do not have household survey, the indicator is formed by utilizing bank account information in combination with GDP per capita. The data is formulated as a cross-section series selecting the latest data as the reference year varying across countries. However, Honohan's (2007 and 2008) calculations only deliver a snapshot of financial inclusion across various countries and is not appropriate for comprehending the relative trends and changes across countries over time.

In order to overcome the aforementioned deficiencies, Sarma (2008, 2010, and 2012) and Chakravarty and Pal (2010) suggested construction of composite indices of financial inclusion that combine numerous banking sector parameters. Importantly, these allocate equal weights to all parameters and dimensions, with the assumption that these dimensions have equal effect on financial inclusion. These indices are created in order to gauge the availability and accessibility; as well as the usage of banking services.

Sarma (2008) described financial inclusion as the level of ease for any individual or a group to access, to reach availability and to utilize the formal financial structure. The study followed a multidimensional approach with an index of financial inclusion (IFI). Information on several dimensions of financial inclusion under single digit between 0 and 1 was captured by the multi-dimensional index. On the one extreme, 0 displayed complete financial exclusion; while on the other side of the spectrum 1 reflected thorough financial inclusion in a country at a given point in time. The easy to calculate index contains information on an inclusive financial system with numerous dimensions. The calculated index in this paper could be utilized to compare different financial inclusion levels across countries at a specific time. It could also be utilized for observing the advancement of policy initiatives for financial inclusion within a time frame. These two

attributes were the biggest advantage of this study. In other words, this paper filled the gap of a comprehensive measure that can be utilized to measure the extent of financial inclusion across economies.

The construction methodology and computation for this index was relatively similar to the well-known development indices of the HDI, the HPI, the GDI. Similar to these indices, the study proposed a dimension index for each dimension of the financial inclusion. The dimension is calculated by subtracting the minimum value from the actual value and dividing it by the difference between the maximum and minimum values. Once each dimension is computed, the index then was determined by the Euclidian distance's normalized inverse of the ideal point.

The IFI index took into account three fundamental dimensions which were selected mainly due to the availability of data for many countries as well as the recent trends in literature.

- i. banking penetration which is measured by dividing number of bank accounts by the total population;
- ii. availability of the banking services which is proxied by bank branch numbers per 1000 inhabitants; and,
- iii. banking system usage which is estimated by dividing the amount of outstanding credit and deposit by the GDP.

Diverging from the methodology utilized by the UNDP for the HDI, the HPI, the GDI which is the simple arithmetic average; the IFI index was a measurement of the distance from the ideal. Moreover, the choice of minimum and maximum values for the dimensions was also different since the UNDP methodology preferred pre-fixed values for the minimum and maximum values for each dimension to calculate the dimensional index. Instead, this study considered the minimum and maximum values within the dataset for each dimension. It was difficult to determine the minimum and maximum for any dimension of financial inclusion. For several dimensions such as the literacy rate and life expectancy, used in UNDP's HDI, it was easy to define limits. However, this was a dynamic index where minimum and maximum values for any dimension may alter at different time points.

In sum, Sarma (2008) followed another method to calculate the indicator. First, he calculated a dimension index for every single financial inclusion dimension and then aggregated each index as the Euclidean distance's normalized inverse. The distance is calculated with respect to an ideal reference point. It is then normalized by the number of dimensions in the composite index. The index did not impose any weights for each dimension.

The index had some limitations; it did not have country specific information, geographical aspects and gender dimension. Due to lack of appropriate data, Sarma was not able to combine numerous aspects of an inclusive financial system including financial services' affordability, timeliness and quality.

Amidzic et al. (2014) defined financial inclusion as an economic state where persons and corporates have access to fundamental financial services based on motivations excluding the criteria for efficiency. They concluded that financial inclusion played an important role in maintaining employment, economic growth, and financial stability. However, it was not robustly measured yet. There was no new composite index with weighting methodology. In their paper, countries were ranked based on the new composite index (variables are listed below on Table 1.1). They provided an additional tool that could be utilized for monitoring on a regular basis for policy purposes.

Table 2.1 Composite index variables (Amidžić)

Variable	Description
Number of ATMs per 1,000 square kilometers	Sum of all ATMs multiplied by 1,000 and divided by total area of the country in square kilometers.
Number of branches of ODCs per 1,000 square kilometers	Sum of all branches of commercial banks, credit unions & financial cooperatives, deposit-taking microfinance institutions and other deposit takers multiplied by 1,000 and divided by total area of the country in square kilometers.
Total number of resident household depositors with ODCs per 1,000 adults	Sum of all household depositors with commercial banks, credit unions & financial cooperatives, deposit-taking microfinance institutions and other deposit takers multiplied by 1,000 and divided by the adult population.
Total number of resident household borrowers with ODCs per 1,000	Sum of all household borrowers from commercial banks, credit unions & financial cooperatives, deposit-taking microfinance institutions and other deposit takers multiplied by 1,000 then divided by the total adult population.

Source: Assessing Countries' Financial Inclusion Standing A New Composite Index, Amidžić et al., February 2014.

For every year, the sample size was comparatively small, given that few economies were reporting the data for the four variables at the same time. Even with a small sample, the calculated index showed remarkable results pertaining to financial inclusion. The utilized dataset in this paper satisfied the prerequisites for the usage of factor analysis (FA).

In order to compute the index, the authors used a five-step sequence. As a first step, the variables were normalized making the scale which they were measured irrelevant similar to the UNDP's approach. Then, using FA, the authors introduced a statistical definition for the dimensions of financial inclusion to make sure that the statistical groups formulated from FA are similar to the theoretical dimensions. With the statistical dimensions matching with the theoretical dimensions, the authors then used in the next step, dataset's statistical properties to give weights to each variables and sub-indices. Finally, dissimilar the UNDP's indices which were calculated by using the simple average mean the results of the second and final steps let them choose in the fourth and fifth steps a weighted geometric average to aggregate the calculation of the dimension and composite indices.

Aggregation of variables that were measured in different units with different ranges necessitates normalization. Normalization addresses the lack of scale invariance. In the literature, there has been various proposed normalization approaches. An inclusive review of the different approaches can be seen in Freudenberg (2003), Jacobs et al. (2004), and OECD (2008). Practically speaking, however, the standardization, the minimum-maximum, and the distance to a reference are the most common methods. Of the three main techniques, Amidzic et al. utilized the distance to a reference in their study. The distance to a reference is measured by the relative position of the variable compared to its reference point. The reference point was a goal at a specified time or the variable's value in the reference country. The authors identified the reference point for every variable to be the highest value of the variable across countries. In other words, for a given variable, the benchmark country was identified as the group leader. The normalized variable ranged between 0 and 1 where a score of 1 was given to the leading country and the other countries were assigned percentage points away from this particular leading country. Additionally, this method satisfied most of the prerequisite methodological properties. In a nutshell, Amidzic, Massara, and Mialou (2014) built a financial inclusion indicator as a composite indicator of variables with respect to its dimensions, outreach (in other words geographic and demographic penetration), usage (deposit and lending), and quality (disclosure requirement, dispute resolution, and cost of usage). Every measure was first normalized, then identified statistically for each dimension, and then finally aggregated into one indicator using statistical weights. Weighted geometric mean

was used as the aggregation technique. A downside of this approach was that it used factor analysis method to decide which variables to include for each dimension. In other words, it did not entirely utilize all available data for each country. Additionally, it assigned several weights for every dimension, which implied the standing of one measure compared to the other.

Unlike Amidzic et al. (2014) and Sarma (2008), Honohan (2008) formed a financial access indicator for 160 countries which combined both data of household surveys and published data on financial institutions into a single composite indicator. The study furthermore evaluated country characteristics that might affect financial access. Among tested variables, aid as percentage of gross national income (GNI), age dependency ratio, and population density significantly lowered financial access; while mobile phone subscription and quality of institutions significantly increased financial access. Their results showed that financial access considerably reduces poverty. While looking at the cross-country link between poverty and financial access. This result held only when financial access was the only regressor, however it lost its significance when additional variables were included as regressors.

Honohan (2007) particularly tested the significance of his financial access indicator in lowering income equality in an earlier version of his study. Per his conclusion, higher financial access reduced income inequality significantly as measured by the Gini coefficient. Yet, the linkage between the two variables depended on the specification that was utilized, i.e., when the access variable was included on its own and/or included financial depth measure, the results were significant, but the same result did not hold when the control variables including per capita income and dummy variables used.

2.2. INDEX FORMATION AND ANALYZING GROWTH, INEQUALITY AND STABILITY

The research on the relationship between financial inclusion, inequality and macroeconomic growth has been limited. While studying the Mexican towns with the highest rate of bank branch network growth, Bruhn and Love (2014) conducted a natural experiment to show that increased access to financial services results in an increase in income for low-income individuals by allowing informal business owners to maintain their business. This in turn created an overall increase in employment. Previous studies

have tested the impact of financial inclusion on poverty and income inequality. Similarly, Burgess and Pande (2005) showed a decrease in rural poverty in India as a result of an expansion of bank branches in rural areas. These results have been challenged (Panagariya 2006 and Kochar 2011). Precisely, the authors had strong evidence that extension of bank branches in rural locations in India (where unbanked population is high) was linked to the lessening of rural poverty in these parts. Similarly, Brune et al. (2011) stated that in rural parts of Malawi, increased financial access via savings account improved the welfare of poor families as it provided access to their savings in order to use agricultural input. Allen et al. (2013) stated that in Kenya by serving for the deprived families, commercial banks can increase the financial access of the poor.

Park and Mercado (2015) examined the importance of financial inclusion given that increasing the access to financial services for the poor households was known to be an effective instrument to reduce poverty and to alleviate income inequality.

The paper used Sarma's definition (2008) that indicated "financial inclusion as a process that facilitates the access, availability, and usage of financial services" for the whole society.

In order to test whether financial inclusion diminishes poverty and income inequality in developing Asia, the authors created their own financial inclusion indicator covering 37 Asian countries utilizing numerous dimensions of financial inclusion including accessibility and usage.

The authors followed Sarma's methodology (2008) in building their financial inclusion indicator. They included five indicators: (i) automated teller machines (ATM) per 100,000 adults, (ii) commercial bank branches per 100,000 adults, (iii) borrowers from commercial banks per 1,000 adults, (iv) depositors with commercial banks per 1,000 adults, and (v) domestic credit to GDP ratio. The first two indicators belonged to the availability of banking services as a dimension of financial inclusion, while the following three indicators belonged to the usage dimension of financial inclusion. All of the indicators were taken from the World Bank's World Development Indicators, and every indicator for every economy used the value of average from 2004 to 2012. The authors preferred to use averages, rather than conducting an annual analysis, to overcome yearly instabilities and to contain as many countries as possible. In sum, the authors downloaded data for 188 countries counting those from developing Asia.

Once computing average for the covered period for every indicator of financial inclusion for 188 countries, the dimension index was calculated in line with Sarma (2008), where the dimension index for i^{th} dimension d_i was derived as:

$$di = \frac{Ai - MINi}{MAXi - MINi} \quad (2.1)$$

where A_i represents i dimension's actual value, MIN_i was dimension i 's minimum value, MAX_i represents dimension i 's maximum value. Country i 's financial inclusion index was then calculated by the normalized inverse of Euclidean distance of point d_i computed in Equation (1) from the ideal point I which was equivalent to 1. Precisely, the formula was the following:

$$Fli = 1 - \frac{\sqrt{((1-d1)^2 + (1-d2)^2 + \dots + (1-dn)^2)}}{\sqrt{n}} \quad (2.2)$$

The second term of the numerator in equation stood for the Euclidean distance from an ideal point. The authors then normalized it by taking the square root of the number of observations and then subtracting it by 1. The authors normalized the indicator for placing the calculated values between 0 and 1, where 1 was the uppermost financial inclusion index and 0 was the bottommost, again in line with Sarma (2008).

The difference between their indicator with Sarma's (2008) indicator was that they had all data which is available irrespective of dimension. Domestic credit and deposit were included as usage dimension measures in Sarma's (2008) index. In addition to usage indicators, credit to GDP indicator was included.

The financial inclusion indicator displayed a parallel pattern in terms of ranking as the indicators of Honohan (2008) and Sarma (2008). The factors that considerably influenced financial inclusion indicator in developing Asian countries were tested. The estimates showed per capita incomes', rule of law's, and demographic factors' significance. The authors then tested if the financial inclusion reduces poverty and income inequality in the covered region. Their results evidently pointed out a significant and robust correlation

between greater financial inclusion and lesser poverty and income inequality. The results were robust utilizing Honohan's (2008) indicator for financial access.

First, the level of financial inclusion was significantly influenced by the demographic characteristics of countries in developing Asia. Highly populated countries had a tendency to offer better access to financial services. The countries with higher dependency ratios had lower access to financial services. The findings had essential implications for the policy makers, particularly for the countries with fast aging population. For these countries, the provision of pensions from retirement and other old-age benefits would be critical in increasing access to financial services of elderly population.

Second, close to the findings of Honohan (2008) and Rojas-Suarez (2010), financial inclusion was significantly increased by good governance and high quality of institutions. This implies that to widen financial access, developing Asian countries must continue to advance the quality of their governance and institutions, particularly by the reinforcement of the rule of law, together with the implementation of financial contracts and financial regulatory controls. Sustaining high quality rule of law will lessen involuntary financial exclusion of majority of the inhabitants.

Third, their estimates provided solid correlation between access to finance and poverty levels. Their findings pointed out that in order to reduce poverty rates in Asia, policymakers must implement policies which addresses barriers to financial inclusion. Encouraging inclusive growth must accompany efforts to raise financial inclusion. Credit availability to lower income groups would improve their access to finance, which consecutively would give them competence to conduct productive activities and to smooth their consumption during short-term adverse shocks.

In summary, this paper developed a measure for financial inclusion that utilized cross-country data that was available while concentrating on developing countries in Asia. Additionally, this paper aimed at comprehending the relationship between financial inclusion; poverty; and income inequality in developing countries of Asia.

Within precincts of country level data, financial inclusion was connected with a number of macroeconomic outcomes including economic growth, stability and equality (Sahay et al. 2015). Their analysis suggested that financial inclusion could be positively linked to these outcomes but the relationship may depend on dynamics including the level of per

capita income or quality of regulatory setting. Before this study, there was no robust research showing a direct impact of financial inclusion on economic growth and inequality at the country level.

Data availability was one of the reasons behind the lack of research showing the relationship between financial inclusion and macroeconomic performance indicators (GDP growth and income inequality). A sufficiently long time-series on financial inclusion measures was needed to establish such a relationship. Until lately, there were no comparable data on financial inclusion which restricted the ability to assess the impact. Collection of data on financial inclusion on selected economies started in 2004 as a piece of the IMF's Financial Access Survey. Additionally, there was no comparable demand-side data globally on financial inclusion collected from individuals until the World Bank launched its first Global Findex database in 2011 (Demirguc-Kunt et al. 2015).

Sahay et al. (2015a) constructed a comprehensive measure of financial development which was called the Financial Development ("FD") index. Since the 1970s, majority of the literature approximated financial development by private credit to GDP ratio, and also by stock market capitalization to GDP ratio. The index formulated in this paper included both banking and non-banking financial institutions as well as three dimensional markets comprising of depth, access and efficiency.

This paper then explored the impact of finance on economic growth. Many authors, starting from Bagehot (1873), pointed out the explanations in order finance to play a role in facilitation of economic growth. McKinnon (1973) and Shaw (1973) stated that barriers to financial development (for example financial repression) were expected to hinder growth by restraining the savings that could otherwise be mobilized for investment purposes, and by precluding financial intermediation from directing these resources into the more productive accomplishments. The 1990s were marked by numerous theoretical models utilizing the before mentioned ideas, depending on endogenous growth and concentrating on the financial system's several functions. As stated by Levine (2005), the leading channels through which finance was likely to affect growth included: production of information; capital allocation to productive uses; monitor of investments and exertion of corporate control; facilitation of trade, risk diversification, and management; mobilization of savings; and expedition of goods and services exchange. The previously used variables in the studies on finance—including the private credit to GDP ratio and

market capitalization to GDP ratio—were the approximations which do not explain how much finance achieves the numerous functions.

The Financial Development index was formulated by utilizing literature's standard practice explained as following: Indicators were selected to measure each sub-index at the bottom of the pyramid in other words, FID, FIA, FIE, FMD, FMA, and FME, with the letters D, A, and E representing depth, access, and efficiency, respectively, and I and M representing institutions and markets, respectively. Each indicator was then normalized between 0 and 1. By doing so, the highest (or lowest) value of a given variable within the time frame and economies was equivalent to one (or zero). The other values were measured comparative to these maximum (minimum) values. In order to overcome the drawbacks stemming from outliers, the data were winsorized with the 5th and 95th percentiles as the limits. The indicators were defined so that higher values stood for more financial development. Then, all indicators were aggregated into the six sub-indices at the bottom of the pyramid. The aggregation was formulated by a weighted average of the underlying series. The weights were taken from the principal component analysis, which reflected the input of each underlying series to the specific sub-index's variation. Lastly, sub-indices were aggregated into higher-level indices by utilizing the above explained procedure, closing the analysis at the most aggregated level in the final FD index.

The dataset contained yearly data for the years starting from 1980 and ending in 2013 for 128 advanced, emerging, and low-income countries from the World Bank Global Financial Development Database and World Bank FinStats, IMF's Financial Access Survey, Dealogic corporate debt database, and Bank for International Settlement (BIS) debt securities database. These variables (Table 2.2) followed the general logic described in Sahay et al. (2015a) and had the aim of covering a broad range of economies within an extensive period. As an example, the Global Findex provided beneficial user-side data on access. However, the data were only available for two years (2011 and 2014). Likewise, a conceptually attractive efficiency measure based on distance from a "production frontier" was available for only a limited number of AEs, but not for most EMs and LIDCs, so including it would reduce the representativeness of the estimates significantly. As an alternative, Table 2.2 was based on proxy variables with restrictions, yet were all well formulated and available for the wide-ranging country sample. Robustness checks

were conducted pertaining to the below listed individual variables' inclusion, including return on assets and return on equity, to the index.

Table 2.2 Construction of the financial development index

	Financial Institutions	Financial Markets
Depth	- Private-sector credit (% of GDP) - Pension fund assets (% of GDP) - Mutual fund assets (% of GDP) - Insurance premiums, life and non-life (% of GDP)	- Stock market capitalization to GDP - Stocks traded to GDP -International debt securities government (% of GDP) -Total debt securities of nonfinancial corporations (% of GDP) -Total debt securities of financial corporations (% of GDP)
Access	-Branches (commercial banks) per 100,000 adults - ATMs per 100,000 adults	-Percent of market capitalization of to 10 largest companies - Total number of issuers of debt (domestic and external, nonfinancial corporations, and financial corporations)
Efficiency	-Net interest margin -Lending-deposit spread -Non-interest income to total income -Overhead costs to total assets -Return on assets -Return on equity	-Stock market turnover ratio (stocks traded/capitalization)

Source: Rethinking Financial Deepening: Stability and Growth in Emerging Markets, Sahay et al., May 2015.

The utilized approach started with the eminent growth regression specifications, while replacing the financial depth's traditional measures with the composite measure along with its components. As in Beck and Levine (2004) an estimator of dynamic system generalized method of moments (GMM) was utilized with a set of regular controls including initial income per capita, education (secondary school enrollment), trade-to-GDP, consumer price index inflation, government consumption-to-GDP ratio, and foreign direct investment-to-GDP ratio. A dummy variable namely "banking crisis" dummy (Laeven and Valencia 2012) was also introduced in order to control for the growing number of banking crises starting in the 1990s, as proposed by Rousseau and Wachtel (2011).

The equation of basic estimation is:

$$\dot{y}_{it} = \alpha + \beta_0 FD_{it} + \beta_1 FD_{it}^2 + \beta_2 (FD_{it} \cdot Interact_i) + \beta_3 X_{it} \quad (2.3)$$

Consequently, in the economic growth regressions, per capita real GDP growth was regressed on the corresponding financial development indicator (FD or a subcomponent) and its square, additional interactions, and the set of above mentioned controls. The equation was run over five-year periods covering the period between 1980 and 2010, and for 128 economies.

A quadratic function was selected due to its results in former studies that with a focus on traditional depth measures (Arcand, Berkes, and Panizza 2012). While the quadratic form enforced curvature onto the relationship which was estimated, the quadratic term was not necessarily found to be significant. In fact, for many of the FD's subcomponents, the quadratic term was found to be non-significant, and thus there was a linear relationship between estimated finance and growth.

By utilizing the new wide-ranging FD index, the study confirmed the positive relationship between financial development and growth. It was summarized that at higher levels of financial development, the marginal returns to growth from further financial development decreased.

Focusing on a sample of 128 economies for the years between 1980–2013, this study's analysis showed that financial development boosts growth, however the impacts deteriorate at greater levels of financial development, and finally turn into negative. According to the empirical analysis, there was a significant and a bell-shaped relationship between financial development and growth. The approach of estimation pointed out the problem of endogeneity and controls for events of crisis in addition to other standard growth elements, such as initial income per capita, education attainment, trade openness, foreign direct investment flows, inflation, and government consumption. This relationship was consistent with the latest conclusions in the literature (Arcand, Berkes, and Panizza 2012).

There is not many information on financial inclusion's macroeconomic implications, with limited latest exceptions. Sahay and others (2015a), demonstrated that access to finance of the household has a very strong positive link with growth. Additionally, the same paper

displays that there is a bell-shaped relationship between depth and growth (i.e. the law of diminishing returns), which suggests that growth returns decreases much faster beyond a point. Yet, financial institution access (FIA), which is an index of the density of ATMs and bank branches defining inclusion narrowly, had a monotonic link with growth. Dabla-Norris and others (2015) utilized a general equilibrium model in order to demonstrate how decreasing costs of monitoring, lessening requirements of the collateral and by so doing, increasing access to credit of firms would then increase growth. Buera, Kaboski, and Shin (2012) via an entrepreneurship model found that microfinance influences consumption and output in a positive way.

Sahay et. al. (2015) examined the links between financial inclusion and economic growth, financial and economic stability, additionally inequality. The analysis provided by Sahay et. al. demonstrated the macroeconomic ramifications of the notion of financial inclusion and its potential impact. It provided information on the benefits and trade-offs of financial inclusion pertaining to growth, financial and macroeconomic stability, and inequality. Financial inclusion was defined as the access to and use of formal financial services by households and businesses. The paper drew on numerous data sources covering financial inclusion. The data included cross-country surveys conducted in two different years, long-time series across some economies, and other data on firms' access to finance (survey based). Utilizing numerous sources had the advantage that the analysis can examine various features of financial inclusion. The disadvantage was that this method includes the datasets which are not firmly comparable and has some deficiencies.

The indicators included both sides of the providers and the users. Regarding the providers, the FIA index presented in Sahay et. al. (2015a) included several commercial bank branches and ATMs per one hundred thousand adults. For the users, several indicators were investigated including business share and bank financed investments, population share with account at a formal financial institution (also by gender and income groups), firm share identifying finance as a main impediment, adults share utilizing accounts for obtaining transfers and wages, banks' share for borrowers and lastly, insurance products' usage.

The major challenge in building a link between long-run growth and financial inclusion was the absence of sufficient time series of financial inclusion (FI) data. For instance, Financial Institution Access (FIA) index assembled by Sahay and others (2015a) had time

series - number of ATMs and bank accounts - from the IMF's Financial Access Survey (FAS) beginning in 2004 only. Since the sample period was between 1980 and 2010, which was combined with a five-year average for all variables (used in order to smooth out cyclical variations) did unfortunately not deliver strong and usable outcomes in a standard GMM growth regression. Under this particular framework, FIA only delivered two practical time observations (averages of 2000 and 2004 and 2005 and 2010). Due to this, this type of GMM regressions cannot test for the effect of FIA—or other financial inclusion indicators— given that the regressions would not be qualified for the standard diagnostic tests. This paper used OLS estimation for the growth and inequality regressions.

In comparison to the FAS data, the Global Findex data are certainly more comprehensive and would potentially allow for a more robust analysis. However, the Global Findex data looks at financial inclusion only at two points including years 2011 and 2014 assuming that relative financial inclusion did not vary significantly in a given period. Hence, the Global Findex data could be understood as a ranking instead of an absolute level.

An ordinary least squares (OLS) estimation was conducted taking into account a number of countries, relating an FI measure at one particular time (or over a period average) with growth over a time period. Preferably, it would be better to have the initial FI linked to successive growth (as per the King and Levine study) to examine the inverse causality:

$$\dot{y}_{2004-14,i} = \beta_0 + \beta_1 FI_{2004,i} + \beta_2 X_{2004,i} + \beta_3 FIN_{2004,i} \quad (2.4)$$

in which *i* stands for the economy and *X* stands for the controls. Additionally, a financial depth/development variable (*FIN*) can also be included which could be (i) privy (private credit to GDP), (ii) FID (index of financial institution depth), or (iii) FD (the broad financial development index).

To test the relationship between financial inclusion and stability, Sahay et al. (2015) used panel regression with country fixed effects for the timeframe from 2004 to 2011. Dependent variables were bank Z-score, taken from database of the Global Financial Development. Financial inclusion variables were taken from IMF's Financial Access

Survey². These variables in the regression had a lag of one year. Interaction variables were formulated by using the explanatory variables and the variable BCP, which is the approximation for the bank supervision quality by measuring the compliance degree with Basel Core Principles (BCP). Two BCP measures were tested: a composite of all the principles, and a subcategory of BCP principles related to financial inclusion (Core Principles 1, 3, 4, 5, 8, 9, 10, 11, 14, 15, 16, 17, 18, 24, 25, and 29). Control variables were the lagged values of the Financial Institutions Depth index (FID) from Sahay and others (2015a), real GDP per capita, excess of credit growth above nominal GDP; contemporaneous variables of population, FDI-to-GDP ratio, trade-to-GDP ratio, inflation, government balance, a dummy for banking crisis, and the Lerner index. The variable coefficient namely “number of borrowers per 1,000 adults” was negative and significant for both X and X₂. The interaction coefficient with both BCP measures was positive. Pertaining to the other financial inclusion variables, the relationships were trivial or unconvincing.

Sahay et al. (2015) defined inequality by the “ratio of 40”— income share of the bottom 40 percent divided by the income share of the middle 40 percent. Controlling for human capital development measures (income, health, and education), the study found that adults loan attainment ratio has a significant positive impact on the “ratio of 40” during the years covering 2007 and 2012. Yet, this impact did not hold once considering only financial institution loans; therefore, pointing out the informal finance’s role which include family and friends, employers, and other sources. This outcome (reduction of inequality) held for the women share of receiving loans. The impact was robust and greater for a subsample which excludes high-income economies. Lastly, the positive impact on income equality was less noticeable for inequality’s other measures including the Gini coefficient, in which changes can be led by movements in economies with high income levels, with already high financial inclusion. In general, financial inclusion had a positive impact on achieving various macroeconomic goals; however, the magnitude of subject gains diminished with the rise of both dimensions (financial inclusion and depth). Furthermore, there were noteworthy trade-offs in terms of financial stability – i.e.

² ATMs per 100,000 adults, ATMs per 1,000km², commercial bank branches per 100,000 adults, commercial bank branches per 1,000km², registered mobile money accounts per 1,000 adults, deposit accounts with commercial banks per 1,000 adults, depositors with commercial banks per 1,000 adults, household depositors with commercial banks per 1,000 adults, household deposit accounts with commercial bank per 1,000 adults, loan accounts with commercial banks per 1,000 adults, household loan accounts with commercial banks per 1,000 adults, borrowers from commercial banks per 1,000 adults

increased inclusion could result financial destabilization. The paper reached to the conclusion that greater financial inclusion caused higher growth but only to a certain extent. Increased access to banking services by the individuals and businesses led to higher economic growth. Same held true for increasing women users of these services as well. However, there was no solid evidence on the macroeconomic financial inclusion's macroeconomic impact which was mainly because macro data on financial inclusion across economies were in short supply.

Another paper which investigated the linkage of financial inclusion and macroeconomic topics was Dabla-Norris et. al. (2015). In this paper, three indices that embody various fragments of financial inclusion were formed which are (i) utilization of financial services by individuals, (ii) utilization of financial services by SME's; and (iii) access to financing. The paper used three most widely referred sources including the World Bank Global Financial Inclusion dataset (Findex - available for two years: 2011 and 2014), which recorded the methods of borrowing saving and payment structures in 148 countries; the IMF's Financial Access Survey (FAS), which presented the global supply-side data on financial access in 187 areas, and finally the World Bank Enterprise Survey, which firm-level data on access to finance for a representative sample of companies in 135 economies. The authors developed composite measures of individual and company financial inclusion looking at Latin American countries with both time-based and cross-country perspectives. The indices were constructed to encapsulate various aspects such as "access and effective usage of financial services" by individuals and households. The study also appeared to have optimized the use of most relevant parameters (i.e. the account usage, savings, borrowings, and method of payments but omitting of insurance for household inclusion index) given data availability. Finally, the authors looked into various aggregation methods, specifically, weights calculated by using the principle component analysis (Camara, N., and D. Tuesta, 2014), factor analysis (Amidžić et al. 2014) and equal weights. The outcomes were alike after utilizing alternative measures. One of the most significant additions of Dabla-Norris et. al. (2015) study to the inclusion literature was the construction of the index of financial inclusion for SMEs. Didier and Schmukler, 2014 previously analyzed the individual components of the Enterprise Survey data; however, a composite indicator was not previously explored. The comprehensive indicator of company's financial inclusion (see table 1.3 below for details) certainly

resulted in better understanding the relative position of Latin American Countries vis-à-vis the other regions on different aspects of financial inclusion. This is particularly important given the fact that improving SME's access and use of finance is a key economic policy priority in the subject region.

Table 2.3 Financial inclusion index

Financial inclusion index		
Use of Financial Services		Access to financial institutions (physical infrastructure, FAS, WDI)
by households (FINDEX)	by firms (SMEs with <100 employees, Enterprise Survey)	
Account at a formal financial institution (% age 15+)	% of SMEs firms with a checking or savings account	Number of ATMs per 1,00 sq km
ATM is main mode of withdrawal (% with an account, age 15+)	% of SME firms with bank loans/ line of credit	Number of branches of ODCs per 1,000 sq km
Debit card (%age 15+)	% of SME firms using banks to finance investments	Number of branches per 100,000 adults
Loan from a financial institution in the past year (% age 15+)	Working Capital bank financing (%)	Number of ATMs per 100,000 adults
Saved at a financial institution in the past year (% age 15+)	Value of collateral needed for a loan (% of the loan amount)	
Credit card (% age 15+)	% of SME firms not needing a loan	
	% of SME firms identifying access/ cost of finance as a major constraint	

Source: Identifying constraints to financial inclusion and their impact on GDP and inequality: a structural framework for policy, Dabla-Norris et al., January 2015.

The paper concluded that the performance on financial inclusion of companies had been particularly commendable. The region was broadly in line with other emerging markets and, on average, was better than what would be suggested by the economic fundamentals including the income per capita, dominance of foreign owned firms, reliance on fuel exports on financial inclusion of firms. Nevertheless, country experiences varied, and a

few countries have negative firm inclusion gaps. More generally, collateral requirements remained high and access to/cost of finance is seen as a major constraint by a large share of SMEs in some countries. In contrast to firm financial inclusion, Latin American countries trailed behind other emerging market economies on financial inclusion of individuals, especially with regards to accounts and savings which is a result of the region's weak domestic fundamentals including income per capita, educational attainment, the unrecorded economy's portion, and the rule of law.

Inclusion policies' economic impact depended on the source of financial frictions and other country characteristics. Higher financial inclusion could support to spur economic growth and decrease inequality though tradeoffs are likely. In particular, while policies aimed at lowering collateral requirements (e.g. strengthening the legal framework for managing and seizing collateral, reducing the size of collateral requirements, and creating modern collateral registry) were most beneficial for growth, they may also lead to higher inequality as marginal benefits accrue to the top of the wealth and income distribution. In contrast, policies aimed at reducing participation costs (e.g. lowering documentation requirements, reducing red tape and the requirement for informal sponsors for financial access) could help reduce inequality but may not yield substantial growth benefits. Hence, developing tailored policies required an understanding of the country-specific constraints and priorities. Moreover, given potential trade-offs between growth and inequality, a multi-pronged approach to foster financial inclusion was warranted. In addition, financial inclusion strategies may lead to unintended "side effects" (e.g. increased financial instability) that need to be monitored and addressed.

The financial benchmarking literature was used by Alter and Yontcheva (2015) in their analysis. Utilizing a cross-country financial data, Beck, et al. (2008) suggested a method for benchmarking financial development's policy component. Cihak, et al. (2012) introduced the Global Financial Development Database (GFDD) which contained the financial sector characteristics over 200 economies. In this paper, Cihak, et al. used the benchmarking approach both to evaluate financial development in the Central African Economic and Monetary Community (CEMAC) and to make a measure of financial development "gap" for countries covered under their research.

Sub-Saharan Africa (SSA)'s financial development has been bumpy and averagely less progressive when compared with other low-income regions, notwithstanding former reforms and development. In SSA, CEMAC region lagged further behind. As the previous studies have comprehensively demonstrated, financial development affects economic growth and could have a substantial impact in the reduction of poverty and inequality.

In their analysis, annual data covering years between 1997 and 2012 (both included) were used. The so-called country dimension covered 42 SSA economies. All variables were taken average over four-year intervals that were not overlapping intervals (the intervals were as follows: (1997-2000; 2001-2004; 2005-2008; and 2009-2012) following Levine (2005).

The dependent variables included the private credit to GDP ratio and a financial development gap measure which was defined as the gap between the benchmark and the realized level of private credit to GDP. Even though the measures of access and depth had usually dissimilar concentrations and were not perfect substitutes theoretically, these variables were significantly correlated in the covered economies. Higher credit to GDP related factors could be related to greater measures of access to finance.

In line with the literature on the nexus of finance-growth (Levine 2005), the authors included numerous macroeconomic variables including income per capita, inflation, debt to GDP and natural resources to GDP ratio. The natural resources to GDP ratio was calculated by dividing the non-renewable resources by the total GDP. They further included the institutional variables including the effectiveness of the government, political stability and rule of law. They expected healthier institutions (better functioning) to be positively associated with private credit to GDP ratio, and negatively related to the financial development gap. Other independent variables were pertaining to infrastructure of the banking sector and features of the banking systems. High amount of deposits, and low interest rate spreads were expected to positively impact the private credit to GDP ratio. Similarly, a well-functioning institutional framework (including coverage of registry, credit information depth) was predicted to decrease asymmetric information between lenders and borrowers. By so doing, it would enhance financial development. High cost-to-income ratios and increased costs of operations of banks were predicted to be negatively related to financial development as these increased the lending costs. After they accounted for the country's size, density of the population and urban population's

share were predicted to impact access to finance and financial development positively by letting economies of scale. High poverty rates and high infant mortality were mostly linked to lower income and also lower financial inclusion. They further added two variables to measure the new technology development, in other words subscriptions of mobile phones and utilization rates of internet, to examine their link to the development of the financial sector. They identified a CEMAC dummy to show their identification in the CFA franc zone. A panel data analysis was conducted.

The outcome of the regressions showed that more than guaranteeing macroeconomic stability, formal factors and characteristics of the financial sector could influence financial development. Well-functioning institutions of the financial sector, better eminence of credit information (and increased trustworthiness of the information) and enhanced governance could result in promoting the development of the financial sector. Although the theory points out to an association between access to finance and income inequality, the current literature has primarily examined the relationship between financial depth and income inequality. While the conclusion is unsettled on the course of causation between financial development and income inequality; recent studies demonstrated significant impact of financial development on income inequality. It was concluded by Beck, Demirguc Kunt and Levine (2007) that financial development enhances the income of the poor not proportionately and lessens income inequality. According to their findings, reforms in the area of finance that aim at diminishing market frictions can increase growth without altering policies of redistribution. Conducting a panel data analysis of 22 sub-Saharan African economies for the years from 1999 to 2004, Batuo and et al. (2010) found that income inequality decreases, when the economies advance their financial sector.

Aslan and et al.'s (2017) cross-country regressions concluded that financial inclusion was linked to income inequality. The study explored the impact of inequality focusing on gender in access to finance on income inequality. The effect of financial development on poverty and inequality was examined by the current studies. However, there were no cross-country analysis which looked into financial inclusion and income inequality. The authors particularly focused on sub-Saharan Africa, where there was persistent gender and income inequality, much more compared to other regions. The authors utilized the Findex data to construct an index of financial inclusion. The author's conclusion was that

at the country level, unequal financial access was significantly related to the higher income inequality. The authors used the 2011 data for the empirical analysis given that there is only available data on income inequality till 2013, hence with a lag. They constructed indices for both 2011 and 2014.

2.3. WORLD BANK ECA STUDY

Although there is no direct comprehensive index formation to examine financial inclusion, this study is worthwhile to summarize given it highlights important dynamics of the region this paper is covering, namely ECA. The study looked at depth, stability, efficiency and inclusion separately and compared ECA with regional and world averages. The second chapter briefly introduced an inclusion index which will be summarized in the upcoming section.

According to Gould and Melecky (2017), emerging ECA's financial system is significantly less developed and less diversified than Western Europe and East Asia and Pacific which is its middle-income peer. The paper clearly states that finance can be most useful for inclusive growth when people and firms can access and use finance responsibly; when finance is priced competitively; and when it is reliable and when finance helps people confront shocks rather than spreading shocks.

Within ECA, financial progress changes remarkably from country to country. ECA displays the poorest performance in the efficiency frontier and top performance in financial inclusion. The financial inclusion is contributing the most to long term growth. Only firm inclusion and household inclusion are strongly related to long term income growth pertaining to the bottom 40 percent of earners. For overall growth, firm inclusion is mostly associated with growth, followed by efficiency, stability, household inclusion; and depth. The global financial crisis has affected ECA significantly. Although credit growth decelerated in the crisis, financial inclusion was high compared with other regions- albeit very uneven across ECA sub-regions.

ECA has reached comparatively high levels on firm and household access to finance. By the early 1990s, ECA displayed nascent financial systems. Rapid financial deepening during the last two decades advanced ECA's financial inclusion. However, this also resulted in two waves of banking crisis- that of late 1990s and that associated with the 2008 global financial crisis. Overall ECA's financial development is still low given the

region's medium income standing. Even though ECA has deep banking systems and displays progress in financial inclusion, financial stability and efficiency remained frail and capital markets were shallow.

The paper used four financial outcomes to assess ECA financial systems: (i) depth (all indicators as percentage of GDP): private sector credit by financial intermediaries; domestic bank deposits; consolidated foreign claims of banks which is reported to the Bank for International Settlements (BIS); stock market capitalization; and assets of nonbank financial intermediaries; (ii) stability: nonperforming loans to total gross loans, balance sheet Z score, percentage of liquid assets in deposits and in short-term funding; and banks' equity to assets ratio; (iii) efficiency: net interest margin (percentage of interest bearing assets); overhead costs (percentage of total assets); cost to income ratio of the bank; stock market turnover ratio (representing percentage of average market capitalization); (iv) inclusion: amount of branches for each 100,000 adults; percentage of adults who own an account at a monetary intermediary, with borrowings from a financial institution, debit or credit card, or savings at a financial intermediary.

The four dimensions (listed in table 2.4) showed that ECA was situated below the global average compared to other regions on depth and stability and about average when it comes to efficiency and inclusion. ECA's financial systems were governed by banks. More than half of ECA countries had higher credit and cross-border banking than other countries. Furthermore, ECA countries were behind pertaining to financial stability. Levels of non-performing loans were considerably higher. Banking sector efficiency was relatively high in ECA, more than half of ECA countries have lower cost to income ratios and overhead costs than the global median. However, the stock market turnover ratio was significantly lower, which indicated that there is a greater reliance on banking compared to the nonbank sector. Finally, most of the financial inclusion indicators in the region, containing the number of bank account owners, loan and/or credit card holders were over the world average. However, the share of population savings formally was low.

Table 2.4 Benchmarked ECA financial development indicators

Indicator	ECA median value	Global median value	Percent Difference
Depth (% of GDP)			
Private sector credit	57.3	41.9	26.9
Domestic bank deposits	45.1	48.8	-8.2
Consolidated BIS claims	30.7	20.2	34.1
Stock market capitalization	13.0	28.1	-116.2
Insurance company assets	4.0	5.3	-32.5
Mutual fund assets	2.9	11.9	-310.3
Pension fund assets	4.0	9.7	-142.5
Stability			
Nonperforming loans	11.3	4.3	61.9
Z-score	11.1	13.4	-20.7
Liquid assets to short-term funding	25.8	28.0	-8.5
Bank capital to assets	13.5	9.6	28.9
Efficiency (%)			
Net interest margin	4.2	3.8	9.5
Overhead costs	3.2	2.8	12.5
Bank cost-to-income ratio	59.0	56.1	4.9
Stock market turnover ratio	5.2	13.2	-153.8
Inclusion			
Account at financial institution	56.5	45.1	20.2
Borrowed from financial institution	13.2	9.7	26.5
Debit card	39.7	28.5	28.2
Saved at financial institution	8.7	14.9	-71.3
Credit card	13.5	10.1	25.2
Number of branches	24.3	12.3	49.4
Firms financially constrained	16.3	25.3	-55.2

Source: Risk and Returns Managing Trade-Offs for Inclusive Growth in Europe and Central Asia, Gould and Melecky, 2017.

This paper compared the level of financial development with the global median values. Indicators with a value greater than zero indicated financial outcomes that were greater than the global median values.

Financial inclusion for the median country in Central Asia, South Caucasus and other Eastern Europe was lower than the global median, although these sub-regions showed some improvement in recent years. Central Europe had higher level of financial inclusion albeit with a decline in recent years. Private credit by financial intermediaries and bank

deposits are relatively higher than the global median benchmark, for all sub-regions except Central Asia, South Caucasus, and Other Eastern Europe. Stock market capitalization to GDP has remained low for most sub-regions.

Banking overhead costs and cost-to-income ratios were high across the region. Russia and Turkey had large market turnover rates, showing their ease of capital market transactions compared to other ECA sub-regions. Indicators of financial inclusion exceeded the global median in many ECA countries except for Central Asia and several indicators in the South Caucasus and Other Eastern Europe. Savings remained very low across the region. Countries in Central Asia showed very low levels of financial inclusion. For example, almost all adults in Slovenia had a bank account, in Turkmenistan the level of account ownership was very low and improved only slightly from 2011 to 2014. In Central Asia, adults with borrowings from a financial intermediary comprise a very low share. The debit card usage was very common in Central Europe but low in some countries in Central Asia and South Caucasus. In addition, saving at a financial institution was higher in Central Europe.

The level of financial inclusion among firms was more diverse. The number of financially constrained firms increased during the post crisis period in several countries, and a lower share of firms had access to bank financing or raised funds on the stock market in 2013 compared to 2019.

The analysis in the second chapter of the study highlights that ECA's financial sector development stood to benefit inclusive growth the most. Main messages included: (i) For inclusive growth, the most important dimension of finance was the firm level access to finance, particularly access to equity financing. Finance can affect income growth mostly by enhancing allocative efficiency rather than mobilizing savings for investment. (ii) Banking crises reduced medium-term growth in both the advanced European Union (EU) countries and Emerging ECA. Greater firm and individual level financial inclusion can mitigate the busts in the cumulative growth in the course of banking crises. However, for the bottom 40's income growth, the mitigation factor is not noteworthy.

Excluding the impact of financial sector development, the median annual gross domestic product (GDP) growth in the region, for the period 2000-14, was 1.8 percent higher than indicated by the growth fundamentals. This corresponded to the highest unexpected

growth among the developing regions, and is even greater than the unexpected growth in the developed European countries.

Financial development was positively associated with economic growth in ECA. Higher-than-expected cumulative income growth and bottom 40 percent's income was significantly associated with indicators of financial development, categorized by depth, stability, efficiency, and inclusion.

ECA already scored relatively high on financial inclusion and access (frequency and ease of interaction with the financial system by firms and individuals) so the benefits to further enhancements may be smaller than through greater efficiency. The region may still increase growth by adopting policies designed to advance financial access.

The study looked at four different indices reflected in the table 2.5:

Table 2.5 Index indicators

Depth Index	- Private credit by deposit money banks to GDP (%) - Liquid liabilities (M3) to GDP (%) - Stock market capitalization to GDP (%) - Deposit to GDP
Stability Index	- Average output loss during banking crisis - Average number of years in a financial crisis - Average fiscal cost of a financial crisis - Bank credit to bank deposits (%) - Credit / GDP volatility - Increase in NPLs
Efficiency Index	- Bank lending-deposit spread (%) - H-statistic - Bank overhead costs to total assets (%) - Bank net interest margin (%)
Firm Inclusion Index	- Investments financed by equity or stock sales (%) - Firms using banks to finance working capital (%) - Firms identifying access to finance as a major constraint (%) - Firms with bank loans or line of credit (%)
Household Inclusion Index	- Borrowed from a formal financial institution (% age 15+) - Purchased agriculture insurance (% working in agriculture, age 15+)

Source: Risk and Returns Managing Trade-Offs for Inclusive Growth in Europe and Central Asia, Michael Gould and Melecky, 2017.

Gould and Melecky (2017) had the independent variables as composite indexes composed of mean and standard deviation- centered variables (including stability, depth, efficiency, firm-level inclusion and household-level inclusion). The level of significance of the growth regression determined the selection of variables in each index. Each index was formed by taking a simple average of the variables with the properly adjusted weights for the missing observations.

Firm-level financial inclusion was measured by using the Enterprise Survey. Account ownership was measured by using the variable namely: “Percent of firms with a checking or savings account.” Payment was quantified with the variable “Used an account at a financial institution for business purposes.” Corporate savings were analyzed by the variable “Saved to start, operate, or expand a farm or business.” The credit usage was captured by “Percent of firms using banks to finance working capital” and “Percent of firms using banks to finance investments”.

The World Bank’s Global Findex and Enterprise Surveys data were used to measure financial services. The authors made a distinction between individuals and firms and categorized their variables with respect to the financial service type. The selection of the variables was based on the past research (Beck et al. 2008; Demirgüç-Kunt, et al. 2012), on the country coverage availability.

The financial firm inclusion variables were significantly correlated with growth, and many of these coefficients are large. The portion of firms with access to equity investment had a foremost impact on growth. Raising investment through equity sale could develop corporate governance and the accountability of the firm and by so doing could improve growth. The number of firms which have loans or lines of credit from the banks is highly and positively related to both growth and income growth of the bottom 40.

Overall, as the utilization of formal finance (such as firms with bank loans or firms that finance their investment through equity issuance) increases, the long-term growth rate also rises. Credit availability may let entrepreneurs to utilize business opportunities and to withstand economic downturns. Greater firm inclusion also could encourage firms to leave the informal sector to utilize financial services.

Household-level financial inclusion was positively related to economic growth as well. Loans and insurance products have the highest impact. Loans could constitute a restriction on households that are planning to human capital investments. Growth rates of

income could be increased by the greater household inclusion. The amount of household inclusion indicators that were significantly associated with growth was small compared to the number of significant firm inclusion most likely due to the fact that households use financial services for nonpecuniary reasons, such as consumption smoothing.

In conclusion, according to the Gould and Melecky's findings (2017, pg. 56):

the strongest associations between financial development and overall growth, in order of size, come from firm inclusion (0.622 index coefficient), efficiency (0.611 index coefficient), depth (0.445 index coefficient and 0.138 index squared coefficient), stability (0.354 index coefficient), and household inclusion (0.326 index coefficient). For the bottom 40 percent only, firm inclusion and household inclusion are significantly associated with income growth (index coefficients of 0.505 and 0.369, with firm inclusion having a larger impact).

3. DATA AND METHODOLOGY

3.1. DATA

3.1.1. Composition of the Index

This study will measure the financial inclusion by using a multi-dimensional indices approach. It will use Norris and Deng's approach (Norris et al. 2015) in constructing three multi-dimensional indices that encompass different aspects of financial inclusion:

- i. household-level utilization of financial services (demand side) (Global Findex);
- ii. firm-level utilization of financial services (Enterprise Survey); and,
- iii. access to finance, particularly financial institutions (Financial Access Survey).

3.1.1.1. Global index

The Global Financial Inclusion (Global Findex) dataset was launched in 2011 by the World Bank. It was comprised of comparable indicators showing how people globally tend to save, to borrow, to make payments; and to manage risk. The survey was carried out covering 2011 and the 2014 by Gallup, Inc. under the umbrella of Gallup World Poll. The Global Findex dataset for 2014 contains more than 100 indicators, while covering information regarding gender information, age classification, and household income. The indicators were formed by using the survey data from interviews conducted with 150,000 nationwide representative and randomly selected adults (more than age 15) and in 143 countries representing more than 97 percent of the global population (see Appendix-1 for the list of included countries and Appendix-2 for the survey questionnaire).

Face to face surveys were carried out in countries where telephone coverage constitutes less than 80 percent of the population. Mostly, the fieldwork was finalized between two to four weeks. In countries where face-to-face surveys were completed, the first sampling stage was the primary sampling unit classification. Survey respondents were randomly selected within the designated households.

Data weighting was used to make sure that each country was represented by a nation-wide sample. Closing weights comprised of the base sampling weight, which provided corrections for probability of unequal selection based on size of the household; and the post stratification weight. This then corrected sampling and nonresponse error. Population statistics on gender, age, education and socioeconomic status, where there was reliable data, was used for post stratification weights.

It should be noted that Global Findex data were a milestone, which delivered exceptional comprehension to how people saved, borrowed, made payments and managed risks in more than 140 countries.

The Findex is complimentary to other datasets given that it focuses on persons, rather than financial institutions. It does not provide aggregate measures of financial depth, as in the case of the IMF's Financial Access Survey data and World Bank Enterprise Surveys.

However, Findex dataset also have some restrictions. The probable econometric methodologies and realistic endogeneity controls were limited due to the lack of a time dimension. Additionally, an examination of development of financial inclusion over time and its impact assessment on macroeconomic outcomes are also very limited. Finally, individuals are not observable between different years (Aslan et al., 2017).

3.1.1.2. Enterprise survey

Enterprise Survey is a vast dataset with an extensive collection of economic data on 131,000 firms in 139 countries. An Enterprise Survey is survey at the firm level representative of a sample of private sector of a country. The surveys contain a variety of business environment topics including but not limited to access to finance, corruption, crime, infrastructure, competition; and performance measures.

The World Bank Group and its partners globally that include small, medium, and large companies conducted the Enterprise Surveys. The surveys were directed to a demonstrative sample of firms in the formal private economy excluding agri-firms. The survey respondents were consistent in all economies and included the whole manufacturing, services, transportation and construction sectors. The main sectors were the manufacturing and services. Government services, public utilities, financial services and health care were not involved in the selected group. Since 2006, majority of

Enterprise Surveys have been implemented in a constant universe, implementation methodology. There has been a main questionnaire creating the foundation for the Global methodology. See the Appendix-3 interview questions regarding finance (these include only the questions that were used in the firm level index in this study).

The Enterprise Surveys brought together a broad range of both qualitative and quantitative information by conducting interviews in person with executives and company-owners at the firm level pertaining to the business environment in their economies and the firm productivity. There are various topics covered in Enterprise Surveys including but not limited to business licensing, crime corruption, finance, innovation, informality, infrastructure, labor, perceptions about limitations for doing business, regulations, taxes and trade.

The economies' business environment dynamics are connected to the firms' performance and productivity by the qualitative and quantitative data which were coming from the surveys. The Enterprise Survey is beneficial tool both for the policymakers and academics. The surveys are reconducted over time in order to track deviations and benchmark the effect of reforms on surveyed firms' performance.

On behalf of the World Bank, privately hired contractors finalize the Enterprise Surveys. Due to delicate survey questions referring to relations between businesses and the government; and topics related to bribery, private contractors do not have any association with any government agency or an organization affiliated to the government/government agencies. The World Bank directly hires the contractors to collect the relevant data. The interviewees are owners of the businesses or top managers in these businesses. In some cases, the contractors call accountants of the company and managers of human resources to answer questions in the sections of sales and labor of the survey. In general, in large countries, 1200-1800 interviews are conducted, in medium-sized countries, 360 interviews are conducted; and in smaller countries, 150 interviews are conducted.

The Enterprise Surveys deliver indicators that show how firms finance their operations and features of financial transactions at the firm level. For instance, Enterprise Surveys deliver indicators that compare the relative utilization of numerous sources for financing the investment. According to the surveys, relying excessively on internal funds could potentially lead to inefficient financial intermediation. Second indicator set measures individual firms' usage of financial markets. This second set indicator contains the

question referring to the amount of working capital which is financed externally. In this set, a measure of the additional restrictions imposed by loan agreement covenants was analyzed by levels of collateral with respect to the value of the loan. Other indicators concentrate on private firms' financial service usage both on the credit and deposit aspects. On the credit, it looks at the number of firms which have lines of credit (in percentage terms). Regarding the mobilization of deposit, it looks at the number of firms which have either a checking or savings account (in percentage terms).

Enterprise survey questions on the finance section included:

- i. Percent of firms with a bank loan or with a credit line.
- ii. Proportion of investments that are financed by banks.
- iii. Proportion of working capital which is financed by banks.
- iv. Percent of firms which use banks to finance investments.
- v. Percent of firms which use banks to finance working capital.
- vi. Percent of firms that identify access to finance as a major constraint.
- vii. Percent of firms with a checking or saving account.
- viii. Percent of firms which do not need a loan.
- ix. Percent of firms which applied to a loan but got rejected.

3.1.1.3. Financial access survey

In June 2010, the IMF began to disseminate the results of its annual Financial Access Survey (FAS).

The IMF's FAS database publicly publishes at no cost key indicators of geographic and demographic reach of financial services, in addition to the primary dataset. The FAS covers the main indicators of financial access and utilization by both households and firms which are globally comparable. It is one of the broadest sources of international supply-side database on financial inclusion.

The FAS questionnaire is updated sporadically to reflect the major trends and innovations in provision and usage of the financial services. In 2012, the questionnaire was expanded to include time series for credit unions, financial enterprises, and MFIs; to classify distinctly SMEs, households, both life insurance, and non-life insurance firms. In 2014, the questionnaire was further extended to include data on mobile money indicators.

The FAS has been conducted annually since 2004. Seventh series was completed on September 2016. The FAS database contains annual meta-data including 189 countries. The FAS aimed at collecting global comparable dataset on financial inclusion including as many economies as possible. It was ensured that the finalized questionnaires were accurate and fully completed. Throughout the survey, a list of country representatives was developed and maintained to make sure that future rounds of the survey could be conducted.

FAS mainly encompasses two main dimensions of financial inclusion including access to basic consumer financial services and utilization of basic consumer financial services. Pertaining to institutional coverage, it covers all financial corporations which provide financial services.

The concepts in FAS are taken from the methodology in the IMF's Monetary and Financial Statistics Manual and its supplementary Compilation Guide. All surveyed economies are given a set of documents with the relevant methodologies where the utilized concepts are defined. All interviewers are requested to document any deviations from the FAS concepts in the corresponding country notes. These country notes are also published in addition to the FAS data in the website (See Appendix-5 for the list of countries included in FAS database and Appendix-6 for list of FAS indicators)

3.1.2. Methodology of the Index

First, three different indices were formulated; however, there was no composite index given that it would limit the data only for 2011 and 2014 since the household survey (Global Findex) data is only available for those dates. Individual components of the Enterprise Survey were already analyzed (Dider and Schmuckler 2014). Composite indicator for the Enterprise Survey, Global Findex and FAS has not been analyzed in detail. The indicators were kept the same with a focus on ECA region. The comprehensive indicator of firms' and household's financial inclusion help understanding the relative position of ECA on various aspects compared to other regions particularly improving access and use of finance are viewed as key policy areas in the region. The other components of the indices are based on the literature (R. M. Sahay 2015) and the indicators that were selected are in line with (Dabla-Norris Era 2015) (Amidžić 2014).

These three indices capture different aspects of financial inclusion, which include access to financial services by both households and firms in addition to effective use of these services. The diagram below shows the indicators included in each of the indices. This study does not calculate a single index from the three separate indices, particularly due to variance in cross-country datasets and their coverage within households and firms. Instead, it will compare ECA to other regions for households across period, and distinctly on each dimension.

Table 3.1 Composition of indices

Indices	Subcomponents	Variables	Sources
<u>Use of Financial Services</u>	Households (% age 15+)	- Account at a financial institution - Debit card - Credit card - Loan from a financial institution in the past year - Saved at a financial institution in the past year	Global Findex
	Firms/SMEs (Enterprise Survey <100 employees)	% of firms a checking or savings account % of firms with bank loans/ line of credit % of firms using banks to finance investments % of firms using banks to finance working capital % of firms identifying access/ cost of finance as a major constraint	Enterprise Survey
<u>Access to Financial Infrastructure</u>		- Number of ATMs per 1,000 square km - Number of branches of ODC's per 1,000 square km - Number of branches per 100,000 adults - Number of ATMs per 100,000 adults	Financial Access Survey

The subcategories are chosen based on the previous studies including Sahay et al., Dabla-Norris et al. and Amidzic which were explained in detail in the literature review section. All variables were normalized as shown below, while formulating the composite index:

$$\text{Index}_{a,it} = \frac{a_{it} - \min(a_{it})}{\max(a_{it}) - \min(a_{it})} \quad (3.1)$$

Where $\text{Index}_{a,it}$ is the normalized variable of a of country I and on year t, $\min(a_{it})$ is the minimum value of variable a_{it} over all it; and $\max(a_{it})$ is the maximum value of a_{it} . For those indicators, which display an absence of financial inclusion, (for example, the percentage of firms that identify access or cost of financial services as a key limitation), the reverse formulation was utilized:

$$I_{a,it} = 1 - \frac{a_{it} - \min(a_{it})}{\max(a_{it}) - \min(a_{it})} \quad (3.2)$$

In the existing literature, quite a few methods were utilized for the estimation of the weights comprising of the principal component analysis, factor analysis, in addition to equal weights assigned within the index's subcomponent. Looking at the previous and on-going studies, it was decided that the equal weights method is more robust for the aggregation. Norris and Deng used the index with equal weights for the simplicity of exposition and the weights (Dabla-Norris Era 2015). (See Appendix-7,8 and 9 for index results)

3.2. METHODOLOGY

After the completion of the index formation, the relationship between the explanatory variables and financial inclusion was explored. For usage indices including household-level index and firm-level index, cross sectional analysis; for access index panel data analysis was conducted while looking at the effect of financial inclusion on growth and on equality. The available access to finance data for a longer time period made panel data analysis feasible with robust results.

3.2.1. Panel Data Analysis

Panel analysis on FAS data was conducted. Given the availability of data for a longer time period from 2004 to 2015, the use of panel data was appropriate. Hausmann test was conducted resulting in significance of fixed effects model so in both growth and inequality regressions, fixed effects model was used.

As explained earlier there are three levels of analysis including financial access, firm level financial inclusion and household level financial inclusion. In the initial analysis, panel data was utilized for examining the link between growth and financial inclusion and between income equality and financial inclusion, after controlling for FI efficiency, FM depth and FM efficiency. Since our sample includes 189 countries from all regions over the period of 2004 to 2015, the use of panel data was a better choice compared to the use of either cross-sectional or time-series only data.

The panel data usage has noteworthy advantages compared to the purely cross-sectional or the purely time-series data. First, by merging the data, the panel analysis improves the correctness of the estimates and by so doing increases the degrees of freedom and variability in the sample. Second, panel estimation procedure results in the reduction of the estimation bias. Third, panel data provides the specification of multipart behavioral hypothesis. Finally, the panel analysis allows for modeling the differences among the subjects, in other words panel data allows to control ‘heterogeneity’.

In this study, the countries in the sample are diverse in terms of their macroeconomic dynamics, their financial institutions and their political setting. Thus, all of these country specific characteristics have an impact on the estimated variables.

A panel data has double subscript on its indicators in both time series and cross-section dimensions. This makes panel data superior to these two alternatives. Hence this characteristic improves the quality and quantity of data.

The following panel regression was conducted:

$$Y_{it} = \alpha + \beta X_{it} + u_{it} \quad (3.3)$$

$$i = 1, 2, \dots, N; t = 1, 2, \dots, T$$

where i stands for subjects (countries) as the cross-section dimension and t stands for time as the time-series dimension. α is a scalar, β is $K \times 1$ and X_{it} is the it^{th} observation of L explanatory variables. The error component is as shown below:

$$U_{it} = \mu_i + v_{it} \quad (3.4)$$

Where μ_i stands for the unobservable specific effects over time and v_{it} for the remainder disturbance, μ_i is assumed to be independently and similarly distributed.

The empirical test is focused on the determinants of growth and equality of the world with a specific emphasis on the ECA region. The model formulated is:

$$GR_{it} = \alpha_0 + \beta_1 FAF_{it} + \beta_2 IRS_{it} + \beta_3 MCAP_{it} + \beta_4 MTURN_{it} + ECADummy + CrisisDummy + \varepsilon_{it} \quad (3.5)$$

$$GINI_{it} = \alpha_0 + \beta_1 FAF_{it} + \beta_2 IRS_{it} + \beta_3 MCAP_{it} + \beta_4 MTURN_{it} + ECADummy + CrisisDummy + \varepsilon_{it} \quad (3.6)$$

Where,

GR_{it} is the growth of country i at time t . One proxy, GDP per capita is used to measure growth.

$GINI_{it}$ is the income equality of country i at time t . One proxy, GINI Coefficient is used to measure income inequality.

FAF_{it} , Financial Access Index, is the measure of access to finance for country i at time t .

IRS_{it} , Interest Rate Spread, is the measure of efficiency of financial institutions for country i at time t .

$MCAP_{it}$, Market Capitalization to GDP, is the measure of depth of financial markets for country i at time t .

$MTURN_{it}$, Stock Market Turnover ratio, is the measure of efficiency of financial markets for country i at time t .

$ECADummy$, is the measure of not whether country i belongs to ECA or not.

$CRISISDummy$, is the measure of whether time t is 2008 or not.

β is a vector of parameters to be estimated.

ε_{it} is the error term.

Two dependent variables used in this study are GDP per Capita (GR) and GINI coefficient (GINI). GDP per Capita is used to measure growth. Economic output and well-being of a country are most appropriately measured by the GDP per Capita. It is the total output measure of a country which is calculated by dividing gross domestic product (GDP) by the country's population. When comparing different countries, the GDP per capita is particularly handy because it demonstrates the relative performance of the countries. Growth in the economies can be tracked by an increase in GDP per capita.

Inequality, as a concept, is much broader than poverty and it includes the entire population. Therefore, it does not specifically focus on the population which is below the poverty line. The most popular way of measuring inequality is by sorting out the population from poorest to richest and then by showing the income percentage relevant to each quintile or decile of the corresponding population. However, this measure does not capture the mid-income population. GINI coefficient, on the other hand, covers all of the segments in the population. GINI coefficient displays all properties including independence of the mean, independence of the size of the population, symmetry and transfer sensitivity. The only caveat with the GINI coefficient is that it is not easy to decompose the causes of inequality. However, this is not needed for the purpose of the study. In this study, GINI coefficient is used to measure income inequality consistent with the literature. The Gini coefficient is a statistical distribution measure formulated in 1912 by the Italian statistician Corrado Gini. It is frequently utilized as a tool of economic inequality, measuring income distribution or to a lesser extend wealth distribution among a population. The coefficient is within the range of 0 (Alter 2015) (or 0 percent) and 1 (or 100 percent), with 0 representing perfect equality and 1 representing perfect inequality. Values over 1 are theoretically probable due to negative income. A country with the same income level of all the residents would have a Gini coefficient of 0. A country which has one individual earned all the income, while others do not earn any income, would have a Gini coefficient of 1 (or 100). Descriptive statistics of dependent variables are given in Table 3.2.

Table 3.2 Descriptive statistics of dependent variables

<u>Variable Name</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>N</u>
GR (GDP per Capita)	8.43	1.53	2173
Gini	37.65%	8.93%	715

The mean value for GDP per capita is 8.43 for 189 countries in 11 years and 37.65 percent for the Gini.

FAF, Financial Access Index is used as a proxy to access to finance. The effect of financial access on growth and income inequality was analyzed in the panel regression analysis. The main adversity in formulating an affiliation between growth and access to finance is unavailability of sufficient time series data of financial inclusion. The Financial Access Index is using the same approach as Sahay and others (Sahay 2015a) did in constructing the Financial Institution Access (FIA) index. The index contains time series— as described in the index formation section—obtained from the Financial Access Survey (FAS) of the IMF beginning in 2004 and ending in 2014. This data is not sufficient to offer robust results using a standard GMM growth regression. Consequently, a panel analysis was used to identify the impact of FAF on growth given the data limitations of the abovementioned index.

There were four control variables initially introduced in line with Sahay et al. (2015). These included the depth and efficiency indicators both for Financial Institutions and Financial Markets; namely private sector credit of GDP (%) for the depth and IRS (Interest Rate Spread) for the efficiency of Financial Institutions; MCAP (Market Capitalization to GDP) for the depth and MTURN (Stock Market Turnover Ratio) for the efficiency of Financial Markets. Private credit to GDP was dropped after the analysis of autocorrelation tests. Interest rate spread is a widely used ratio to measure the efficiency of the financial institutions. It is the difference between the average yield received from loans and other interest-bearing activities and the average rate paid on deposits and borrowings. The net interest rate spread is one of the key determinants of a financial institution's efficiency. The Market Capitalization to GDP ratio is obtained by dividing the total value of all publicly traded stocks in a given country by that country's GDP. It

is mainly used to assess whether the country's stock market is overvalued or undervalued, at the same time it provides the depth of the financial markets in that country. Stock Market Turnover Ratio (MTURN) is calculated by dividing the total value of shares traded during the period by the average market capitalization for the period. All these control variables introduced above were obtained from the World Bank's Databank under Global Financial Development (<https://data.worldbank.org/data-catalog/global-financial-development>).

In addition to the control variables elaborated above, there are two dummy variables, namely ECA and Crisis Dummy. Given that the study investigates the financial inclusion in ECA particularly, the ECA dummy was introduced to identify if it makes a difference to be part of ECA countries in the financial inclusion's impact on growth and income inequality. Additionally, given the period has a year of crisis, the CRISISdummy is introduced to control for the global financial crisis year of 2008 consistent with the existing literature. Previous studies have used other regional dummies for Africa (Alter 2015), Latin America (Dabla-Norris Era 2015) , and Asia (Park 2015).

Table 3.3 Descriptive statistics of independent and dummy variables

<u>Variable Name</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>N</u>
FAF	.06	.06	1,883
IRS	7.55	5.97	1,528
MCAP	58.5	93.91	1,247
MTURN	39.3	58.08	1,231
ECADummy	.19	.46	2,190
CRISISDummy	.14	.34	2,190

Fixed effect and random effect models estimate the parameters of the panel data regression. Panel data models analyze fixed or random effects of the country (or the subject that is analyzed) or time.

While running panel regressions, it is assumed that some regression coefficients alter across individuals and/or over time in order to account for individual differences. There are fixed parameters, even though the regression coefficients are not exactly known. The model is classified as fixed effect model, when the coefficients can change either in one or in two dimensions.

In the current model, the intercept is allowed to change across individuals (households, firms or countries). However, it is assumed that the parameters of the slope and error variances are constant in these dimensions. The random effects model utilizes random quantities unlike the fixed parameters. Random effects are associated with these unsystematic quantities. In the model, the intercept and slope parameters are not different while there is a variance in the components of error variances across individuals and/or times. If the fixed effects model results in huge losses in degrees of freedom, due to too many parameters in these types of models, then the random effects model becomes more appropriate choice. As Judge et al. (1988) and Baltagi (2001) explained in their studies, the random effects model is chosen when individuals are randomly selected from a big population. There has been a heated debate on the selection of the fixed effects and random effects model amongst the econometricians for so long. The choice of the suitable model is based on the assumptions of the interrelationship of the exogenous variables, both cross-sectional and within a period, the error term assumptions, and/or the researcher's propensity for increased efficiency and decreased bias in the estimators. Even though, fixed effects model is mostly less efficient, the model is known to be more consistent and less biased. Random effects model is more restricting than the fixed effects models. The random effects model, which is a specific case of the fixed effects model, needs additional assumptions. Fixed effects model delivers control for all variables that do not vary across time. However, the coefficient estimates for variables that do not vary across time can be calculated by using the random effects model.

It is true that the random effects model has a lesser amount of sample variability which leads to more effective estimators. However, if the assumptions are not realized, the model can cause biased estimators. The researchers mostly prefer fixed effects model due to its unbiased estimators and less restrictive nature. If there is a necessity for the estimates of coefficients for time invariant variables, then random effects model is more ideal.

It was important to decide which model (fixed effects model or random effects model) can be more appropriate for the missing or unbalanced data, which is the case in the current study. Both models are sufficient to work with unbalanced data designs, while maintaining degrees of freedom compared not including observations to generate a balanced data.

In this study, the fixed effects model was expected to be the suitable method given that we expect to see the effect of 2008 global crisis on most of the countries in the sample. Additionally, our sample matches with the population of the study. Finally, our data does not contain any time-invariant regressors. However, it should be asserted that in line with the existing literature, the appropriate model that fits the sample and the research's objective must be used. Hausman and Taylor (1981) test is conducted to decide on the utilization of the appropriate model. In Hausman Test, the correlation between individual effects and regressors is tested with the null hypothesis that there is no correlation between individual effects and regressors. The Hausman Test results for each of the models for two dependent variables are summarized in Table 3.4 and Table 3.5 respectively.

Table 3.4 Hausman test (GDP per capita dependent variable)

Correlated Random Effects: Hausman Test		
Equation- untitled		
Test cross-section random effects		
Test Summary	Chi-Sq Statistics	Prob.
Cross-section random	82.82	0.0000

Table 3.5 Hausman test (GINI dependent variable)

Correlated Random Effects: Hausman Test		
Equation- untitled		
Test cross-section random effects		
Test Summary	Chi-Sq Statistics	Prob.
Cross-section random	27.21	0.0001

Hausman test demonstrates that the fixed effects model is much better than the random effects model for the abovementioned equations given that the results of both tests are significant. Thus, fixed effects model is utilized for the panel data analysis.

In many techniques of time series, stationary data is generally assumed. A stationary data is with a constant mean, variance and autocorrelation structure in a given period. However, the variables need to be tested to make sure that they are all stationary. In

financial models, using non-stationary time series data can result in unreliable and spurious outcomes. If there is an issue with the data pertaining to this, time series data should be then transformed so that it becomes stationary. Stationary process could be transformed by using differencing, if the non-stationary process is a random walk with or without a drift. Detrending could be a solution to remove the spurious results, if the analyzed time series data displays a deterministic trend. In some cases, a stochastic and deterministic trend could be combined by the non-stationary series. In order not to obtain distorted results both differencing and detrending should be utilized, provided that differencing will eliminate the trend in the variance and detrending will eliminate the deterministic trend. To check whether or not the dependent and independent variables are stationary, Unit Roots (based on Dickey- Fuller tests) test is conducted for each variable. It is concluded that all the variables are stationary. Please refer to table 3.6 for summary of Unit-Root test results.

Table 3.6 Unit Root test

<u>Variable</u>	<u>Inverse Chi Squared</u>	<u>P Value</u>
GDP per Capita	570.5	0.0000
GINI	500.2	0.0000
FAF	470.2	0.0017
IRS	685.2	0.0000
MCAP	300.7	0.0283*
MTURN	453.1	0.0000

*MCAP is only significant at 5% and 10% but not at 1%.

The independent variables are tested for correlation by using correlate and pwcorr functions in STATA to check for correlations and pairwise correlations within the variables. It was concluded that private sector credit to GDP (DCR) is correlated with FAF and therefore it was removed from the model. The other independent variables were not correlated with each other. Kindly refer to tables 3.7 and 3.8 for the correlation matrices.

Table 3.7 Correlation matrix (correlations)

Variables	FAF	DCR	IRS	MCAP	MTURN
FAF	1				
DCR	0.6408	1			
IRS	-0.2533	-0.4085	1		
MCAP	0.4459	0.4924	-0.1833	1	
MTURN	0.2848	0.2813	-0.1501	0.1297	1

Table 3.8 Correlation matrix (pairwise correlations)

Variables	FAF	DCR	IRS	MCAP	MTURN
FAF	1				
DCR	0.6435	1			
IRS	-0.2848	-0.3814	1		
MCAP	0.3921	0.4052	-0.1414	1	
MTURN	0.3151	0.3386	-0.1501	0.1297	1

3.2.2. Cross-country Ordinary Least Squares (OLS) Estimation

An estimation of cross-country ordinary least squares (OLS) was conducted, with respect to the measure of household level inclusion (household FI) and firm level inclusion (firm level FI) at one point in time with GDP per capita and GINI.

The empirical test is focused on the determinants of growth and equality of the world with a specific emphasis on the ECA region. The model formulated is:

$$GR_{it} = \alpha_0 + \beta_1 FIH_{it} + \beta_2 IRS_{it} + \beta_3 MCAP_{it} + \beta_4 MTURN_{it} + ECADummy + \varepsilon_{it} \quad (3.7)$$

$$GINI_{it} = \alpha_0 + \beta_1 FIH_{it} + \beta_2 IRS_{it} + \beta_3 MCAP_{it} + \beta_4 MTURN_{it} + ECADummy + \varepsilon_{it} \quad (3.8)$$

$$GR_{it} = \alpha_0 + \beta_1 FIF_{it} + \beta_2 IRS_{it} + \beta_3 MCAP_{it} + \beta_4 MTURN_{it} + ECADummy + \varepsilon_{it} \quad (3.9)$$

$$GINI_{it} = \alpha_0 + \beta_1 FIF_{it} + \beta_2 IRS_{it} + \beta_3 MCAP_{it} + \beta_4 MTURN_{it} + ECADummy + \varepsilon_{it} \quad (3.10)$$

Where,

GR_{it} is the growth of country i at time t . One proxy, GDP per capita is used to measure growth.

$GINI_{it}$ is the income equality of country i at time t . One proxy, GINI Coefficient is used to measure income inequality.

FIH_{it} , Household Financial Inclusion, is the measure of access to finance for country i at time t (data is only available for 2011 and 2014).

FIF_{it} , Firm level Financial Inclusion, is the measure of access to finance for country i at time t (data is only available for 2006, 2009, 2010 and 2013).

IRS_{it} , Interest Rate Spread, is the measure of efficiency of financial institutions for country i at time t .

$MCAP_{it}$, Market Capitalization to GDP, is the measure of depth of financial markets for country i at time t .

$MTURN_{it}$, Stock Market Turnover ratio, is the measure of efficiency of financial markets for country i at time t .

ECA_{dummy} , is the measure of not whether country i belongs to ECA or not.

β is a vector of parameters to be estimated.

ε_{it} is the error term.

The dynamics between Financial Inclusion and growth; between Financial Inclusion and inequality will be analyzed by using OLS estimation formulated above as suggested by Sahay et al. (Sahay 2015).

Although the Global Findex is more comprehensive compared to the FAS, it is only available for two years. Enterprise Survey Data is available between 2002 to 2013; however, its maximum country coverage for the selected indicators was only for the four selected years. Except for the indices; dependent, independent and control variables are the same as the panel regression. Only ECA dummy is used to differentiate ECA from other regions.

Correlation tests were conducted for all independent variables. Credit to GDP was correlated with other independent variables; therefore, it was excluded from the regressions. Please find below the autocorrelation matrices for each regression.

Table 3.9 Correlation matrix (correlations: 2011)

Variables	FIH	MCAP	MTURN	DCR	IRS
FIH	1				
MCAP	0.3424	1			
MTURN	0.4523	0.2365	1		
DCR	0.5935	0.5904	0.6231	1	
IRS	-0.3093	-0.1143	-0.2175	-0.3337	1

Table 3.10 Correlation matrix (correlations: 2014)

Variables	FIH	MCAP	MTURN	DCR	IRS
FIH	1				
MCAP	0.3545	1			
MTURN	0.3120	0.0386	1		
DCR	0.7012	0.6562	0.4775	1	
IRS	-0.2772	-0.0766	-0.1162	-0.2940	1

Table 3.11 Correlation matrix (correlations: 2006)

Variables	FIF	MCAP	MTURN	DCR	IRS
FIF	1				
MCAP	0.1100	1			
MTURN	-0.1379	0.0923	1		
DCR	0.3817	0.5144	0.1732	1	
IRS	-0.0576	-0.1978	-0.0592	-0.3522	1

Table 3.12 Correlation matrix (correlations: 2009)

Variables	FIF	MCAP	MTURN	DCR	IRS
FIF	1				
MCAP	0.2040	1			
MTURN	-0.0324	0.0892	1		
DCR	0.3641	0.5315	0.3468	1	
IRS	-0.0704	-0.1151	-0.0555	-0.3642	1

Table 3.13 Correlation matrix (correlations: 2010)

Variables	FIF	MCAP	MTURN	DCR	IRS
FIF	1				
MCAP	0.2926	1			
MTURN	0.1011	0.2019	1		
DCR	0.3171	0.5591	0.4217	1	
IRS	-0.1865	-0.1653	-0.1558	-0.3542	1

Table 3.14 Correlation matrix (correlations: 2013)

Variables	FIF	MCAP	MTURN	DCR	IRS
FIF	1				
MCAP	0.3180	1			
MTURN	0.0926	-0.0219	1		
DCR	0.4875	0.6659	0.4860	1	
IRS	0.0522	-0.1955	-0.0420	-0.2969	1

Breuch-Pagan/ Cook-Weisberg test is conducted to test heteroscedasticity in 12 OLS regressions that are conducted. According to the test results, no heteroscedasticity is identified. All tests displayed low chi. Find the summary of results in table 3.15 below.

Table 3.15 Heteroskedasticity

<u>OLS Regression</u>	<u>Chi-Square</u>	<u>P value</u>
GDP per Capita/ FIH (2011)	0.42	0.5148
GINI/ FIH (2011)	0.02	0.8846
GDP per Capita/ FIH (2014)	0.85	0.3563
GINI/ FIH (2014)	0.70	0.4044
GDP per Capita/ FIF (2006)	0.75	0.9786
GINI/ FIF (2006)	1.94	0.1636
GDP per Capita/ FIF (2009)	0.00	17.62
GINI/ FIF (2009)	0.73	0.3928
GDP per Capita/ FIF (2010)	0.03	0.4050
GINI/ FIF (2010)	0.82	0.3652
GDP per Capita/ FIF (2013)	0.79	0.3736
GINI/ FIF (2013)	0.07	0.7866

4. FINDINGS

4.1. PANEL REGRESSIONS

This section provides empirical evidence on the effect of financial inclusion on growth and income inequality. The outcome of the unbalanced panel regression on GDP per Capita and Gini Coefficient are given in Table 4.1 and 4.2 respectively.

Table 4.1 Panel data regression for GDP per capita

Dependent Variable: GDP per Capita					
Method: Panel Least Squares					
Sample: 2004-2015					
Periods included: 10					
Cross-sections included: 98					
Total panel (unbalanced) observations: 775					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
FAF	5.860736	.6045067	9.7	0.000	***
IRS	-.0412652	.0056563	-7.3	0.000	***
MCAP	.0002437	.0005977	0.41	0.684	
MTURN	-0.000388	.0002294	-1.69	0.091	*
ECADummy	.0732247	.1090583	0.67	0.502	
CRISISDummy	-.0426154	.0232217	-1.84	0.067	*
Effects Specification					
Period fixed (dummy variables)					
R-squared	0.5832				
Adjusted R-squared	0.5779				
F-statistic	81.46				
Prob (F-statistic)	0.000				

Table 4.2 Panel data regression for Gini Coefficient

Dependent Variable: GINI					
Method: Panel Least Squares					
Sample: 2004-2015					
Periods included: 10					
Cross-sections included: 67					
Total panel (unbalanced) observations: 293					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
FAF	-26.06109	5.367706	-4.86	0.000	***
IRS	.062117	.0479609	1.3	0.197	
MCAP	.0069336	.0074804	0.93	0.355	
MTURN	.010408	.0045361	2.29	0.023	**
ECADummy	-1.466959	.9552657	-1.54	0.126	
CRISISDummy	-0.156644	.258999	-0.6	0.546	
	Effects Specification				
Period fixed (dummy variables)					
R-squared	0.2232				
Adjusted R-squared	0.1599				
F-statistic	70.57				
Prob (F-statistic)	0.000				

As explained in the methodology section, the panel regressions were checked for autocorrelation, heteroscedasticity and normality of the residual term. There were no issues regarding these basic assumptions of the regression analysis. Adjusted R-squared values are 0.58 for GDP per capita and 0.16 for GINI which are in line with the existing literature. The F-test is found significant for both panel regressions.

The first panel regression analyzes the impact of finance on economic growth. The FAF variable is the proxy variable for financial inclusion which encompasses the access component of finance. As this index gets closer to 1, there is more financial access which also contributes to the increase in GDP growth. As expected the coefficient sign is positive and significant for GDP per Capita, indicating that an increase in access to finance results in an increase in economic growth. This outcome is consistent with the previous studies which looked at impact of finance in economic growth. Many authors, starting from Bagehot (1873) searched for the finance's impact on expediting economic growth. McKinnon (1973) and Shaw (1973) stated that the limitations of financial development (including financial repression) were expected to hinder growth by impeding the savings that could otherwise be used for investments, and by inhibiting financial intermediation from utilizing the efficient usage of the resources. The new theoretical models were emerged in 1990s, which formalized these ideas while relying on endogenous growth and with a particular focus on the financial system. As stated by Levine (2005), finance is influencing growth through the main channels that comprise of: information production; capital allocation for productive purposes; trade facilitation, risk management and diversification. The variables which were utilized in finance literature—including private credit to GDP ratio and market capitalization to GDP—are the proxies. They did not essentially clarify to what extent finance captures the several functions. It is necessary to account this in the course of the interpretation of empirical results.

It has been challenging to show the direction of causality from finance to economic growth. King and Levine (1993) addressed this causality in a cross-country regression context for the first time. In order to predict the growth rates, they used the magnitude of the banking system compared to GDP. Depth of the stock market was also utilized by King and Levine (1993), while analyzing the effect of finance on growth. The empirical work utilized panel data analysis techniques in the 2000s (Beck and Levine 2004). Sahay et al. (2015) followed similar approach utilizing akin control variables and econometric methods to make sure that the relationship is not simply a correlation but a causality that goes from finance to growth, not vice versa. Related recent studies concluded that the effect of financial development to growth varies from region to region, in different

countries, and at various income levels (Barajas, Chami, and Yousefi 2013; Nili and Rastad 2007).

Empirical findings of this study showed that there is a negative and significant coefficient on Interest rate spread for the GDP per Capita regressions. There is also a negative but less significant coefficient (significant at 10% only) on MTURN for the GDP per Capita regressions. These are also in line with the literature (R. M. Sahay 2015). Interest rate spread has a negative and significant impact on the bank performance in the long run and that is translated to a negative impact on the GDP growth. Regarding the MTURN, an increase in liquidity could result in the deterioration of growth. Firstly, an increase in the liquidity of the stock market could lead to the reduction of saving rates via both income and substitution effects. The liquidity of the stock market also boosts investor myopia, which then impacts the economic growth unfavorably (Demetriades 1996). Market capitalization to GDP (MCAP) has a negative coefficient, which implies that an increase in MCAP results in a decrease in growth. It is not significant for the growth equation. Therefore, it could be concluded that it does not have a significant impact on the economic growth (as reflected by lack of significant coefficient).

The banking crises have also been defined as a contributing factor while analyzing the relationship between finance and growth (Rousseau and Wachtel 2011). Therefore a “crisis” dummy variable (Laeven and Valencia 2012) was also added to control for the global crisis beginning in the 2008, as also proposed by Rousseau and Wachtel (2011). The crisis dummy was also included in the panel regressions and for the GDP per capita regressions. There is a negative and significant coefficient (at 10% level) for the Crisis dummy in the growth regressions. The results point out that the occurrence of a financial crisis has a negative and significant impact on GDP growth in line with the above-mentioned literature. As concluded in these studies, financial crises have negative impact on the whole economy including the financial sector. Financial crises, particularly the recent subprime crisis affected the economic activity significantly in the main industrial economies, in both emerging and developing countries.

Previous studies did not use any regional dummies to test whether or not being from a specific region has a significant impact on growth. The three studies, summarized in the Literature review (Dabla-Norris et al. 2015; Alter and Yontcheva 2015; Park and Mercado 2015), analyzed the regions separately and conducted the regressions only

including the countries of those particular regions. These analyses were conducted for LAC, SSA and Asia where there are much more countries than ECA. In this study, in order to have sufficient observations, all available countries are included in the analysis and an ECA dummy is introduced to test if being an ECA country has a significant impact on the growth regressions. ECA dummy coefficient is positive, implying that being from an ECA country has a positive impact on the economic growth. However, the ECA dummy is not significant for the growth regression.

The second panel regression analyzes the impact of finance on income inequality. The FAF variable is again the proxy variable for financial inclusion which encompasses the access component of finance. As expected, the coefficient sign is negative and significant for GINI, indicating that an increase in access to finance results in a decrease in income inequality. This is in line with the recent findings of the literature. According to the recent research, access to finance helps reducing inequality. Inequality is defined in several different ways in the current literature. Plotnikov and others defined inequality as “ratio of 40”- which is the ratio of the population of the bottom 40 percent income. They found that there is a significant and negative relationship between access to finance and population of bottom 40. (They included additional controls: income, health, and education). The previous studies pointed out that the impact of financial inclusion on income inequality was less significant while using Gini coefficient as the measure of inequality (Sahay et al. 2015). Park and Mercado identified a significant correlation between financial inclusion and income inequality. They included inflation, primary school completion and growth in bank claims as control variables. They used the Gini coefficient as a proxy for the income equality. They found that the coefficients are robust and significant according to their dataset. However, they have limited number of countries (only developing Asian countries in their sample). In our study, additional regressors (including inflation, education level) decreased the efficiency of the study’s estimates given that each additional regressor decreased the degrees of freedom. Out of the three control variables/ financial development variables, MCAP, IRS and MTURN, only MTURN had a significant positive coefficient. This indicates that as market turnover increases, income inequality also increases. Both MCAP and IRS has positive coefficients; however, they are both not significant. Both dummy coefficients are negative and insignificant for the inequality equation. This implies that the crisis years

have a negative relationship with the inequality. Being from ECA region also has a negative relationship with the GINI coefficient, meaning that being from ECA region decreases the probability of inequality.

4.2. OLS REGRESSIONS

4.2.1. Household-level Growth Regressions

Below is the empirical evidence on the determinants on growth by using the OLS estimation with respect to the measure of household level inclusion. The outcome of the OLS estimations on GDP per Capita for years 2011 and 2014 are given in Table 4.3 and 4.4.

Table 4.3 OLS regression for GDP per capita (FINDEX 2011)

Dependent Variable: GDP per Capita					
Method: OLS					
Sample: 2011					
Number of observations: 76					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
FIH	4.721853	.55900316	8.45	0.000	***
IRS	-0.035594	.017233	-2.07	0.043	**
MCAP	.0009411	0.008225	1.14	0.256	
MTURN	-0.000086	0.0030661	-0.03	0.978	
ECADummy	.2668297	.259125	1.06	0.293	
Effects Specification					
Period fixed (dummy variables)					
R-squared	0.6497				
Adjusted R-squared	0.6246				
F-statistic	25.96				
Prob (F-statistic)	0.000				

Table 4.4 OLS regression for GDP per capita (FINDEX 2014)

Dependent Variable: GDP per Capita					
Method: OLS					
Sample: 2014					
Number of observations: 43					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
FIH	4.98856	0.4570761	10.87	0.000	***
IRS	-0.009286	.0256657	0.36	0.720	
MCAP	0.0007562	0.0005475	1.38	0.176	
MTURN	-0.002145	0.0021835	-0.98	0.332	
ECADummy	.6261881	.3400235	1.84	0.074	*
	Effects Specification				
Period fixed (dummy variables)					
R-squared	0.8105				
Adjusted R-squared	0.7849				
F-statistic	31.66				
Prob (F-statistic)	0.000				

There were no issues with autocorrelation, heteroskedasticity and normality of the residual term for both equations. Adjusted R-squared values are 0.62 and 0.78 for years 2011 and 2014 respectively. The F-test is found significant for both OLS regressions.

FIH, which is the household-level financial inclusion variable, has a positive and significant coefficient for both years. This indicates that the increase in household inclusion results in an increase in economic growth. The result is consistent for both years of analysis. Macroeconomic repercussions of household financial inclusion were also examined in the previous studies. As discussed by Sahay and others (Sahay et al., 2015), access of finance of the household has a significant positive relationship with growth. Additionally, in basic cross-country regressions conducted by Sahay and others, financial

inclusion indicators displayed a positive impact on growth. They included education, government consumption/GDP and private credit to GDP as control variables. However, introducing these variables decreased the explanatory power of this study's model for the cross-country regressions. These impacts are not statistically significant while including these control variables. Furthermore, private credit to GDP variable created autocorrelation problems and therefore it was removed from the regression analyses.

Empirical results of the study further pointed out that there is a negative coefficient on the IRS (interest rate spread/ lending and deposit spread) which is a measure of the efficiency of Financial institutions. As the IRS increases, the growth decreases. This is in line with the literature (Amidžić 2014). This variable is significant for 2011 but not significant for 2014. The other financial development indicators, namely MCAP (proxy for financial market depth) and MTURN (proxy for financial market efficiency) do not have significant coefficients for both years. MCAP has a positive and MTURN has a negative coefficient and this is again in line with the empirical findings in the literature. ECA dummy has positive coefficient for both years implying that being from an ECA country increases the possibility of economic growth. The dummy variable is only significant for 2014. This is mostly because for 2014, there are more ECA countries in the FINDEX database which is then used to construct the FIH variable.

4.2.2. Household-level Gini Regressions

This section provides empirical evidence on the determinants on inequality (proxied by the Gini Coefficient) by using the OLS estimation with respect to the measure of household level inclusion. These regressions were run for both years 2011 and 2014; however, the second regression was omitted due to insufficient number of observations (less than 25 observations). The outcome of the OLS estimations on Gini coefficient for 2011 is given in Table 4.5.

Table 4.5 OLS regression for Gini Coefficient (FINDEX 2011)

Dependent Variable: Gini					
Method: OLS					
Sample: 2011					
Number of observations: 26					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
FIH	-19.00776	10.68757	-1.78	0.091	*
IRS	0.05218819	.1874274	0.28	0.784	
MCAP	0.1108667	0.0345561	3.21	0.004	***
MTURN	-0.0199654	0.0715826	-0.28	0.783	
ECADummy	-9.990145	3.274733	-3.05	0.006	**
	Effects Specification				
Period fixed (dummy variables)					
R-squared	0.6086				
Adjusted R-squared	0.5107				
F-statistic	6.22				
Prob (F-statistic)	0.0012				

There were no issues with autocorrelation, heteroskedasticity and normality of the residual term for this equation. Adjusted R-squared value is 0.51. The F-test is found significant for both OLS regressions.

The household-level inclusion variable (FIH) has a negative and significant coefficient for this equation. This indicates that the increase in household inclusion results in a decrease in income inequality. Impact of household financial inclusion on income inequality was also examined in the previous studies (R. M. Sahay 2015). As discussed by Sahay and others (Sahay et al. 2015), access of finance of the household has a significant negative relationship with income inequality. Regional studies looking at

developing Asian economies had the same conclusion pertaining to the relationship between household level inclusion and income inequality (Park and Mercado 2015).

Empirical results of the study further pointed out that MCAP is found to be positively and significantly related to income inequality. In other words, as market capitalization increases, income inequality also increases. The other financial development indicators including IRS and MTURN are not significantly related to income inequality. IRS has a positive coefficient and MTURN has a negative coefficient, in line with the previous findings. This shows that an increase in interest rate spread results in an increase in income inequality. Also, an increase in market liquidity which is reflected by market turnover results in a decrease income inequality. These are not tested at the household-level in previous literature; however, it is not correct to reach any conclusions given that these two variables do not have significant coefficients.

Finally, the ECA dummy has a negative and significant coefficient for this particular equation. This implies that ECA countries are more likely to have low GINI coefficients.

4.2.3. Firm-level Growth Regressions

Below is the empirical evidence on the determinants on growth by using the OLS estimation with respect to the measure of enterprise level inclusion. The outcome of the OLS estimations on GDP per Capita for years 2006, 2009, 2010 and 2013 are given in Table 4.6, Table 4.7, Table 4.8 and 4.9 on pages 63-66.

Table 4.6 OLS regression for GDP per capita (Enterprise Survey 2006)

Dependent Variable: GDP per Capita					
Method: OLS					
Sample: 2006					
Number of observations: 77					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
FIF	2.466044	0.7523094	3.28	0.002	***
IRS	-0.053808	0.0203477	-2.64	0.010	***
MCAP	0.007474	0.0024334	3.07	0.003	***
MTURN	-0.001659	0.0027892	-0.59	0.554	
ECADummy	0.4601469	0.2743139	1.68	0.098	*
	Effects Specification				
Period fixed (dummy variables)					
R-squared	0.3643				
Adjusted R-squared	0.3196				
F-statistic	8.14				
Prob (F-statistic)	0.000				

Table 4.7 OLS regression for GDP per capita (Enterprise Survey 2009)

Dependent Variable: GDP per Capita					
Method: OLS					
Sample: 2009					
Number of observations: 67					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
FIF	3.135763	0.8719846	3.6	0.001	***
IRS	-0.050526	0.0235363	-2.15	0.036	**
MCAP	0.0062529	0.0035016	1.79	0.079	*
MTURN	8.22e-06	0.0026855	0.00	0.998	
ECADummy	0.4049207	0.3044164	1.33	0.188	
	Effects Specification				
Period fixed (dummy variables)					
R-squared	0.3254				
Adjusted R-squared	0.2701				
F-statistic	5.89				
Prob (F-statistic)	0.0002				

Table 4.8 OLS regression for GDP per capita (Enterprise Survey 2010)

Dependent Variable: GDP per Capita					
Method: OLS					
Sample: 2010					
Number of observations: 68					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
FIF	2.849408	0.8638738	3.3	0.002	***
IRS	-0.052536	0.0227191	-2.31	0.024	**
MCAP	0.003347	0.0032561	1.03	0.308	
MTURN	0.0002101	0.003698	0.06	0.955	
ECADummy	0.3905665	0.3137326	1.24	0.218	
	Effects Specification				
Period fixed (dummy variables)					
R-squared	0.3019				
Adjusted R-squared	0.2456				
F-statistic	5.36				
Prob (F-statistic)	0.0004				

Table 4.9 OLS Regression for GDP per Capita (Enterprise Survey 2013)

Dependent Variable: GDP per Capita					
Method: OLS					
Sample: 2013					
Number of observations: 32					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
FIF	2.119757	1.063519	1.99	0.057	**
IRS	-0.019369	0.0439571	-0.44	0.663	
MCAP	0.0021767	0.0040419	0.54	0.595	
MTURN	0.0013568	0.0044158	0.31	0.761	
ECADummy	0.7095273	0.6792291	1.04	0.306	
	Effects Specification				
Period fixed (dummy variables)					
R-squared	0.2333				
Adjusted R-squared	0.2205				
F-statistic	1.47				
Prob (F-statistic)	0.0002				

There were no issues with autocorrelation, heteroskedasticity and normality of the residual term for this equation. Adjusted R-squared values are 0.32, 0.27, 0.25 and 0.22 respectively. The F-test is found significant for all OLS regressions.

Firm-level financial inclusion variable (FIF) has a positive and significant coefficient. FIF consists of five main indicators including the percentage of firms with checking and savings account, percentage of firms with bank loans/ line of credit, percentage of firms utilizing banks to finance investments, percentage of firms utilizing banks in financing working capital and finally percentage of firms identifying finance costs as the major constraint. The empirical findings of this study show that as this index which captures the inclusion of firms (via the five channels listed above) is positively and significantly

related to growth. This implies that as the firm-level inclusion increases, growth also increases. Dabla-Norris and others (Dabla- Norris et al. 2015) illustrated that decreasing monitoring costs, lessening collateral requirements and increasing access of firms to credit increase growth. They found a significant positive relationship with firm level inclusion and growth. From the financial development indicators, IRS has a negative and significant relationship with growth. This holds for all three years except for 2013. For 2013, the coefficient sign is still negative; however, the coefficient is not significant. Increase in interest rate spreads results in a decrease in growth. Again, this is in line with the previous literature. MCAP also has a significant and positive coefficient for the growth equation for the years 2006 and 2009. For the other three years, although the coefficient has a positive sign, it is not significant. MTURN has a positive but insignificant coefficient for all equations. Finally, ECA Dummy has significant coefficient only for year 2006. It could be stated from the findings of 2006 firm-level growth equation that being from the ECA region increases the possibility of growth. ECA Dummy's coefficient is positive for all equations in this section however insignificant for the other years.

4.2.4. Firm-level Gini Regressions

This section provides empirical evidence on the determinants of inequality (proxied by the Gini Coefficient) by using the OLS estimation with respect to the measure of firm level inclusion. These regressions were run for years 2006, 2009, 2010 and 2013; however, the last two regressions were omitted due to insufficient number of observations (less than 25 observations). The outcomes of the OLS estimations on Gini coefficient for years 2006 and 2009 are given in Table 4.10 and Table 4.11.

Table 4.10 OLS regression for Gini Coefficient (Enterprise Survey 2006)

Dependent Variable: Gini					
Method: OLS					
Sample: 2006					
Number of observations: 35					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
FIF	-6.160574	9.690609	-0.64	0.530	
IRS	0.3876348	0.1801635	2.15	0.040	**
MCAP	0.0387437	0.0251814	1.54	0.135	
MTURN	0.0077805	0.0460901	0.17	0.867	
ECADummy	-13.90648	2.702431	-4.76	0.000	***
	Effects Specification				
Period fixed (dummy variables)					
R-squared	0.6196				
Adjusted R-squared	0.5435				
F-statistic	8.14				
Prob (F-statistic)	0.001				

Table 4.11 OLS Regression for Gini Coefficient (Enterprise Survey 2009)

Dependent Variable: Gini					
Method: OLS					
Sample: 2009					
Number of observations: 31					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
FIF	-16.62024	8.829696	-1.88	0.071	*
IRS	0.2337417	0.2137345	1.09	0.285	
MCAP	0.092637	0.0489693	1.97	0.061	*
MTURN	-0.008225	0.0428044	-0.19	0.869	
ECADummy	-13.32632	2.79962	-5.15	0.000	***
	Effects Specification				
Period fixed (dummy variables)					
R-squared	0.5585				
Adjusted R-squared	0.4824				
F-statistic	7.34				
Prob (F-statistic)	0.002				

There were no issues with autocorrelation, heteroskedasticity and normality of the residual term for this equation. Adjusted R-squared values are 0.54 and 0.48 respectively. The F-test is found significant for both OLS regressions.

Firm-level financial inclusion variable (FIF) has a negative coefficient for inequality equations. It is only significant for 2009. This implies that an increase in financial inclusion of firms results in a decrease of inequality. Pertaining to the financial development indicators, IRS has a positive and significant relationship with inequality for 2006 inequality regression. For the year 2009, the IRS coefficient is not significant. According to the sign of the coefficient, as interest rate spreads increase, the inequality increases. This is also in line with the previous literature (Sahay et al. 2015). MCAP has

a significant and positive coefficient for the inequality equation for the year 2009. The coefficient is not significant for MCAP for 2006. The sign of MCAP implies that as market capitalization increases, the level of inequality also increases. MTURN coefficients have diverging signs for the two analyzed years and these coefficients are not significant. Finally, ECA Dummy has significant negative coefficient for both years. It could be stated from the findings of the firm-level inequality equations that being from the ECA region decreases the possibility of inequality.

4.3. ECA FINDINGS

4.3.1. Household-level Financial Inclusion

There was not much information on household-level financial inclusion before 2011 (particularly pertaining to the account ownership and the detailed breakdown of gender and poor within financial inclusion). The 2011 Global Findex surveys were a milestone shedding light into the saving, borrowing, and payment management trends of individuals thus highlighting individual risk management. In 2014, new data were added including mobile payments. According to the Global Findex database, ECA had 105 million unbanked people. This number reaches to 2 billion worldwide, and ECA has a significant share in this category.

According to the survey results, ECA has displayed a continuous growth in ownership of accounts. The account ownership increased from 43 percent in 2011 to 51 percent in 2014 (average rate of account ownership in developing countries was 54 percent). Some countries in ECA showed significant increases, namely Romania, Kazakhstan and Albania. Some countries in the region maintained the same level of account ownership including Armenia, Macedonia, Moldova and Turkey.

In ECA, the most prominent factor behind financial exclusion has been the absence of trust in financial intermediaries. 30 percent of the interviewers from ECA mentioned lack of trust as the reason of not having an account, well above the global average of 13 percent. This outcome is not surprising if one looks at the history of this particular region (prevalence of bank failures and devaluations of currencies). Absence of trust in banks has been shaping the way people who are in ECA utilize formal financial intermediaries. For example, 30 percent of unbanked people (approximately doubling the global average) stated that they have no trust for financial intermediaries to open an account. This ratio

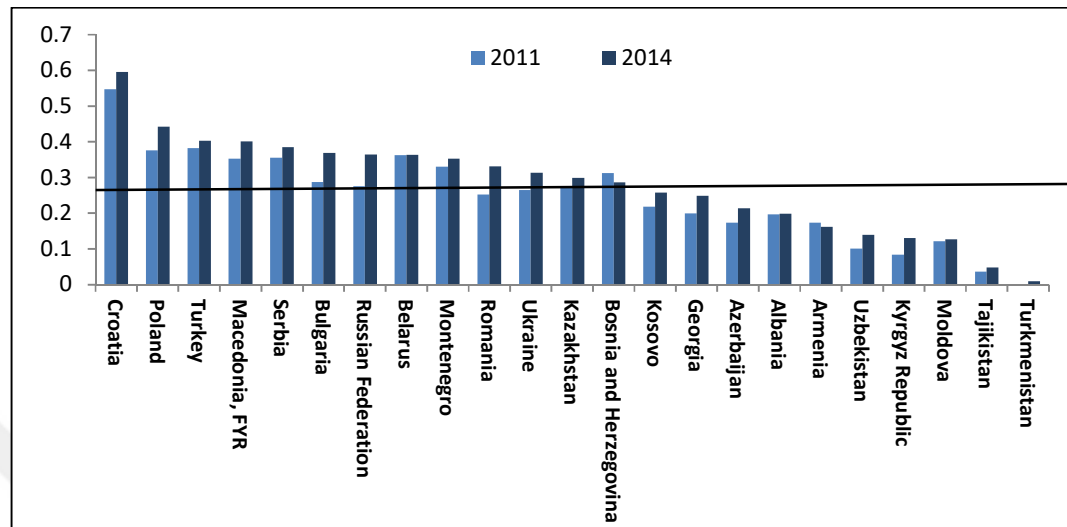
hits 55 percent in Ukraine. Only 8 percent of ECA interviewees used financial intermediaries for savings compared to 27 percent worldwide. Formal savings were even less: in ECA only 15 percent of the account holders have formal accounts, compared to 42 percent globally.

Additionally, religious factors were mentioned three times more than the global average. This is because of the predominant Muslim concentration in Turkey and Uzbekistan, where nearly 25 percent of unbanked adults gave religion as a reason of lacking a bank account. Overall, 13 percent of interviewees cited religious motives, well above the 5 percent globally.

On a positive note, although lack of trust and religious tendencies contributed to decreased formal savings and account holding, it did not hinder digital payments. 72 percent of account holders either receive or make payments by utilizing their accounts. Compared to other regions, only sub-Saharan Africa exceeds this percentage due to common usage of technologies based on card payments. 23 percent of the interviewees in ECA were using debit cards and 15 percent were using credit cards. ECA has the highest usage of cards (only Latin America had similar figures). Employers had a big role in this lion's share: 60 percent of the earnings were sent to a financial account (of the 37 percent of interviewees who are wage-earners in ECA). This is the highest percentage within developing regions.

Although there have been noteworthy enhancements between 2011 and 2014, ECA has been behind Euro Area and OECD countries on financial inclusion of households. In 2011, Croatia, Turkey and Poland displayed the highest scores on financial inclusion of the household with ECA. In 2014, the same countries had the highest score.

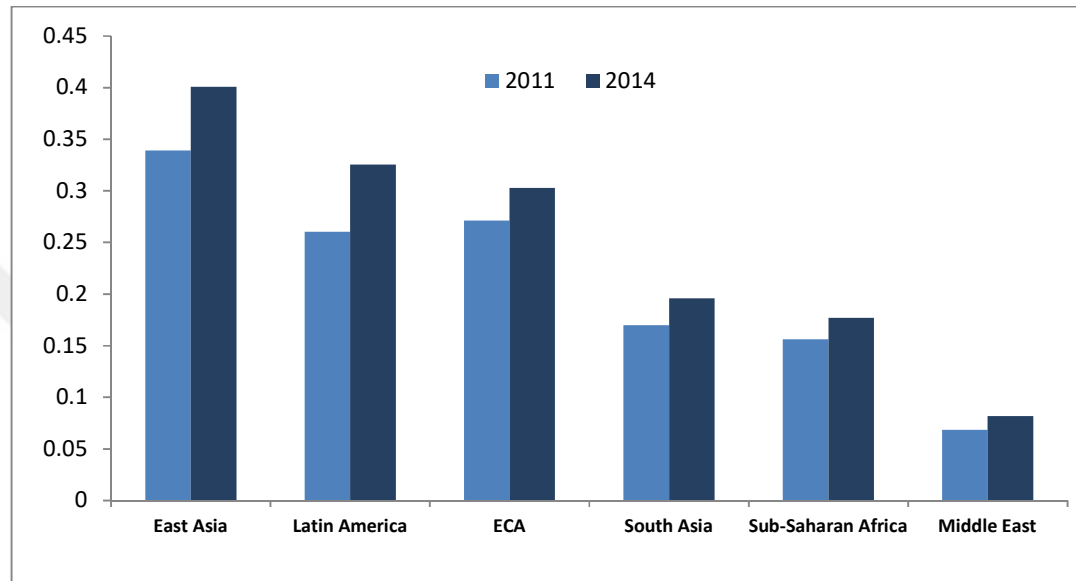
Figure 4.1 ECA countries household index



Within the covered ECA countries, Croatia stood out both in 2011 and 2014 pertaining to the household index based on Global Findex database. Croatia has deep financial markets which can serve to wide population. Financial markets are also inclusive for the low-income households. The government has worked on the consumer protection and financial literacy. They both facilitate trust of customers for the financial institutions. The European Union has also been very active in engaging Croatia to a detailed program to improve consumer protection within the financial services industry. The EU also encourages Croatia to strengthen its financial education programs. In conclusion, the EU anchor has been very instrumental for Croatia to improve house-hold level financial access. Croatia is followed by Poland and Turkey. After the global financial crisis, the Polish economy bounced back which resulted in an increase in disposable income per capita. Sentiment of the households also improved and this encouraged them to use more financial services. Additionally, in Poland, there is a well-functioning financial system which facilitates the capital movement from entities with excess funding to entities with a need for funding. The worst performers included Turkmenistan, Tajikistan and Moldova in both years of household index. Kosovo, Georgia, Azerbaijan, Albania, Armenia and Kyrgyz Republic remained under ECA average for 2014. Household-level usage of finance improved for all countries from 2011 to 2014 except for Armenia and Bosnia. In Belarus and Albania, the calculated indices remained the same; pointing out no change

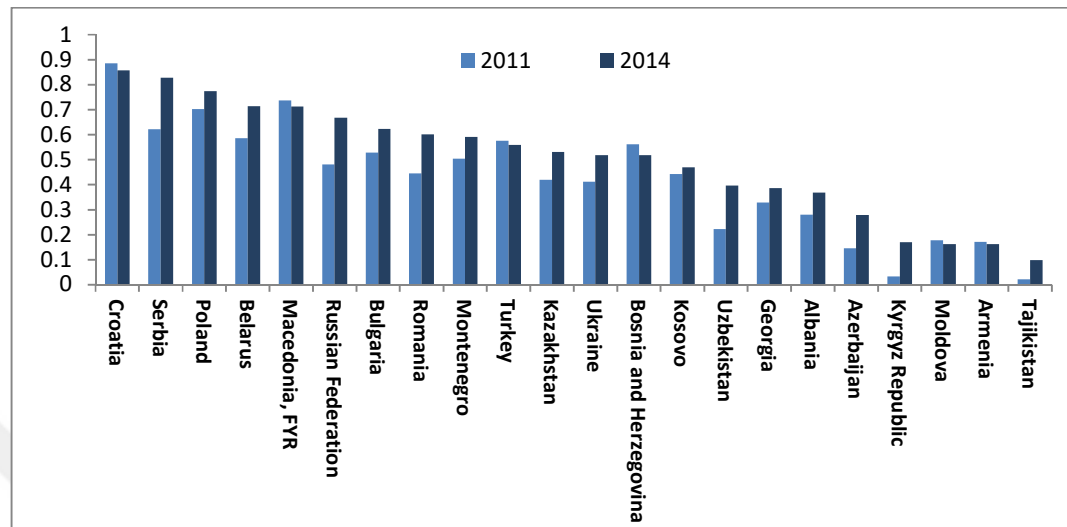
between 2011 and 2014. Kyrgyz Republic, Russia and Romania improved the most respectively from 2011 to 2014 in terms of household inclusion.

Figure 4.2 Regional household index



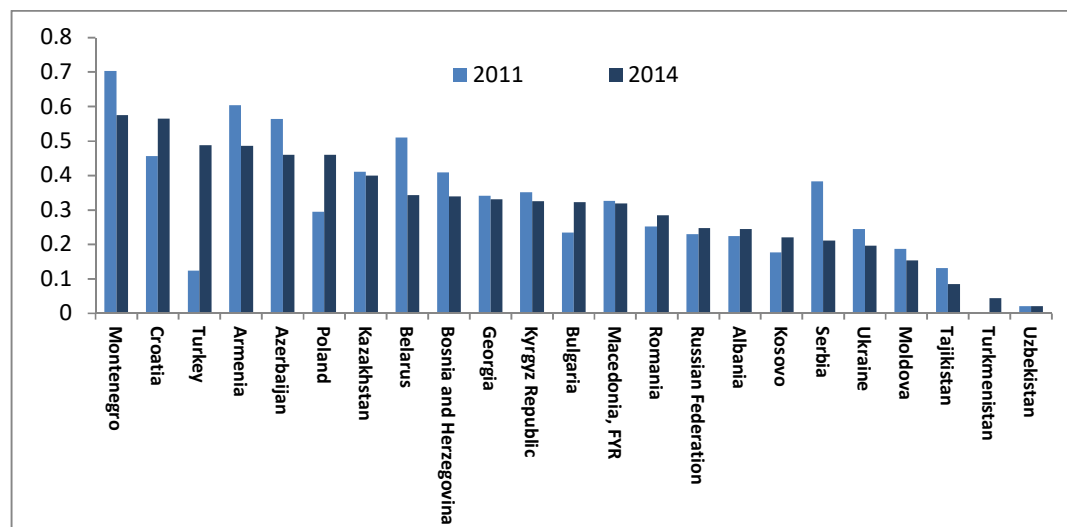
The World Bank Group categorizes the world under six regions including East Asia and Pacific, Latin America and Caribbean (Latin America), Europe and Central Asia, South Asia, Sub-Saharan Africa, Middle East and North Africa (Middle East). This regional categorization was used in this study given that same regional division applied for the data which was utilized throughout the study. All regions displayed an increase in the financial inclusion of households. East Asia outperformed other regions for both years pertaining to the household index. This is mainly driven by the positive impact of developing Asian countries including Singapore, Republic of Korea and Hong Kong. ECA moved from being second to third from 2011 to 2014. This is mainly due higher increase in Latin America compared to ECA region. Latin America and Middle East improved the most related to the household index.

Figure 4.3 ECA Findex: holding an account



According to holding an account data, Croatia outperformed other ECA countries. Croatia is followed by Serbia and Poland. Turkey remained in the mid ranks with respect to this indicator. In Macedonia, Turkey, Bosnia, Moldova and Armenia, holding an account indicator worsened from 2011 to 2014. There were remarkable improvements in Russia, Uzbekistan, Azerbaijan and Kyrgyz Republic pertaining to this indicator.

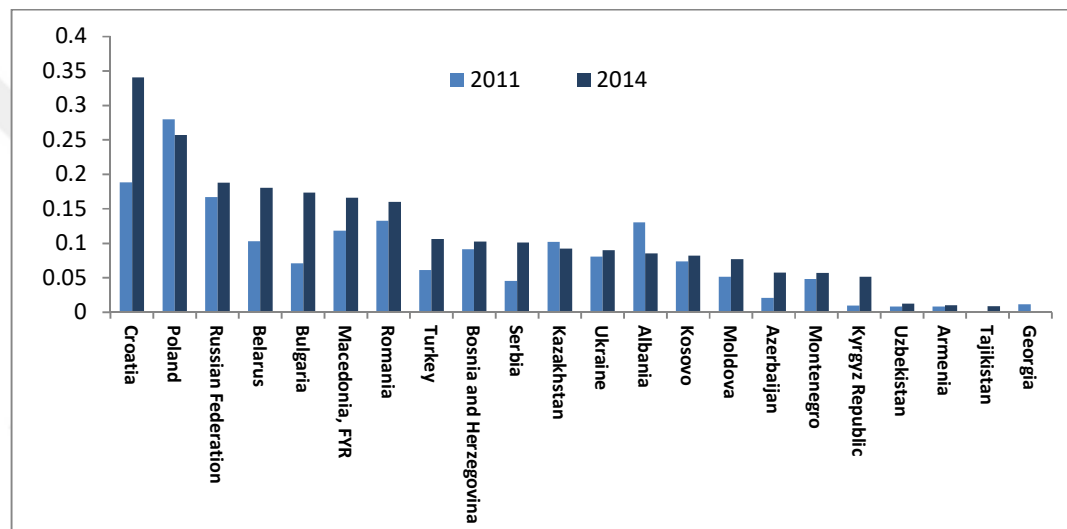
Figure 4.4 ECA Findex: borrowed from a financial Institution



With respect to borrowing from financial institutions, Montenegro ranked the highest and it was followed by Croatia and Turkey. Borrowing from a Financial Institution

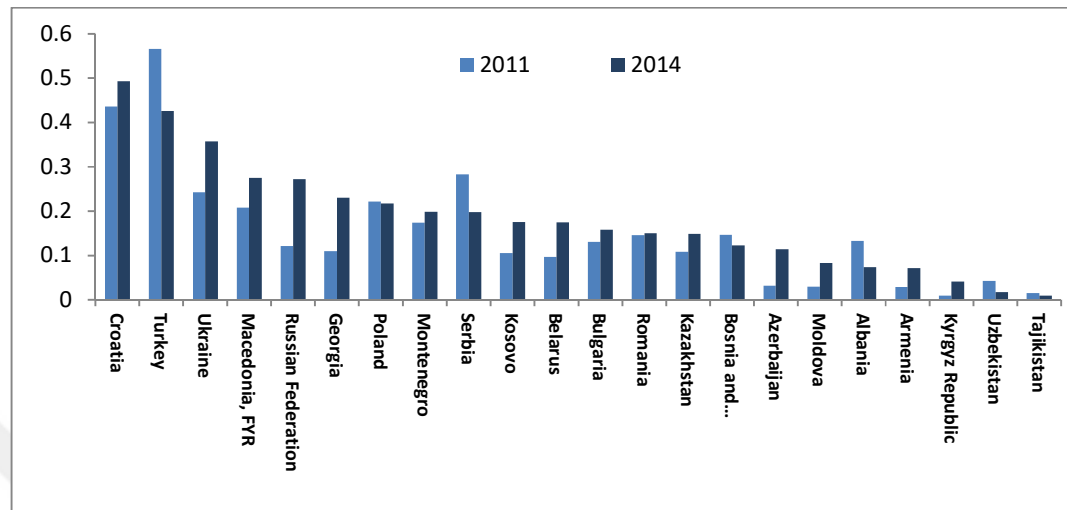
significantly increased in Turkey from 2011 to 2014. The worst performers for this indicator were Tajikistan, Turkmenistan and Uzbekistan. This is in line with loan to GDP ratios of these countries. In these three countries, the financial sector has remained small and could not meet the financing needs of the economies. The governance and level of regulation in the financial sector are low in these countries which in turn build household's mistrust for the financial institutions.

Figure 4.5 ECA Findex: saved at a financial institution



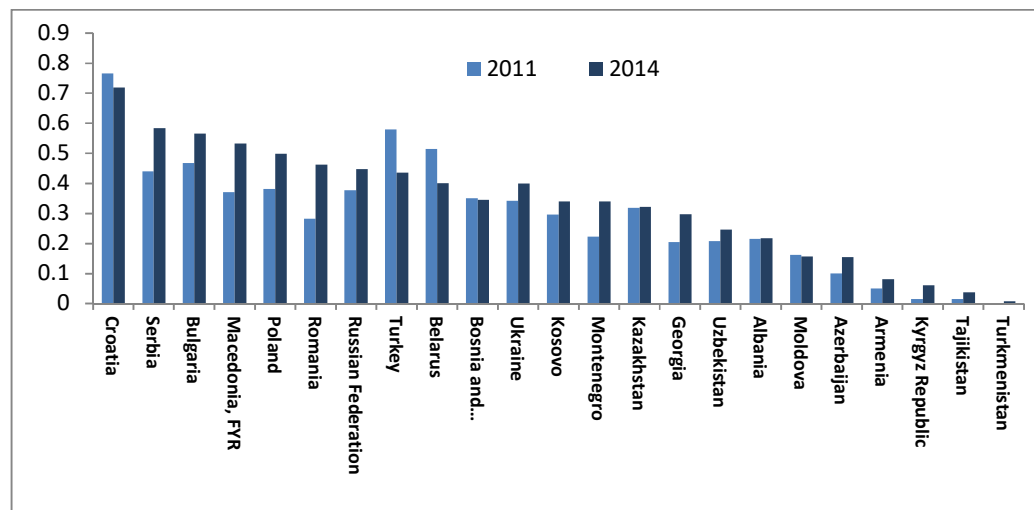
ECA countries do not perform well when it comes to saving at a financial institution. This is due to legacy of banking crisis and distrust of households to the financial institutions. Croatia and Poland again displayed the highest numbers for the indices, albeit both are below 0.4. Armenia, Tajikistan and Georgia had the lowest rankings with the region. In Georgia, the observed low level of saving is mainly as a result of a disorganized spending behavior which is not backed by sufficient income levels. The Georgian population displays natural propensity to spend in extreme amounts. In Tajikistan, the low rate of savings is mainly due to the factors described above. In both Armenia and Uzbekistan, savings rate is very low compared to the region.

Figure 4.6 ECA FinIndex: credit card usage



With respect to credit card usage, Croatia again ranked the highest within ECA region. It is followed by Turkey and Ukraine. The lowest indices belonged to Kyrgyz Republic, Uzbekistan and Tajikistan. Bulgaria, Romania, Kazakhstan, Bosnia and Azerbaijan were also at the lower end of the index rankings within the region. Credit card usage decreased in Turkey, Serbia, Poland, Bosnia and Albania from 2011 to 2014. In the Central Asian countries particularly Kyrgyz Republic, Uzbekistan and Tajikistan, credit card usage is not widespread due to preference for the utilization of cash over credit cards. These are cash economies with the lowest credit card penetration levels.

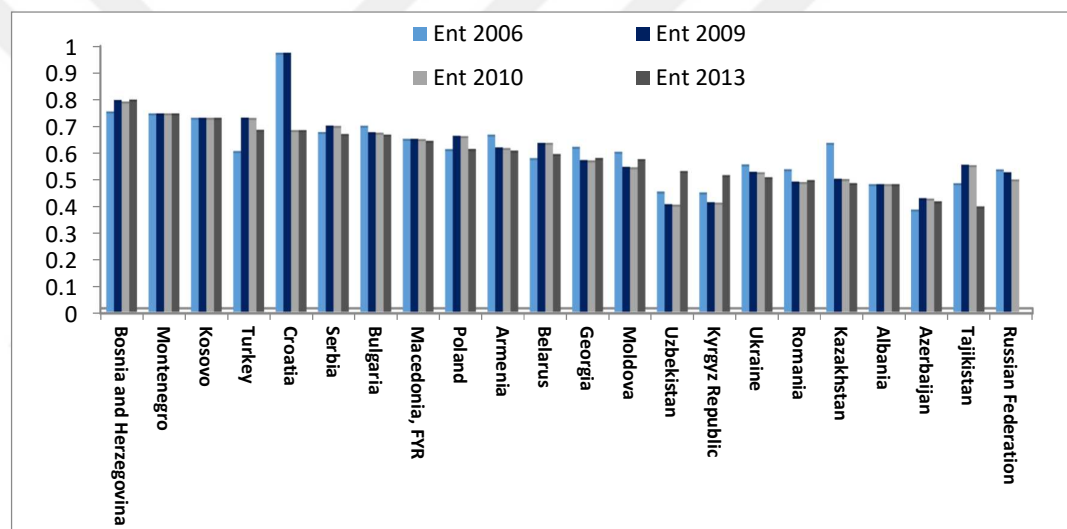
Figure 4.7 ECA FinIndex: debit card usage



Croatia had the highest debit card usage in the region for both years. It was followed by Serbia and Bulgaria. Households in Kyrgyz Republic, Tajikistan and Turkmenistan had the lowest ranking for debit card usage (the indices were closer to 0 indeed). This is also due to the fact that these are cash economies as explained above. The index worsened from year 2011 to 2014 in Croatia (less compared to other three countries) Turkey, Belarus and Moldova.

4.3.2. Firm-level Financial Inclusion

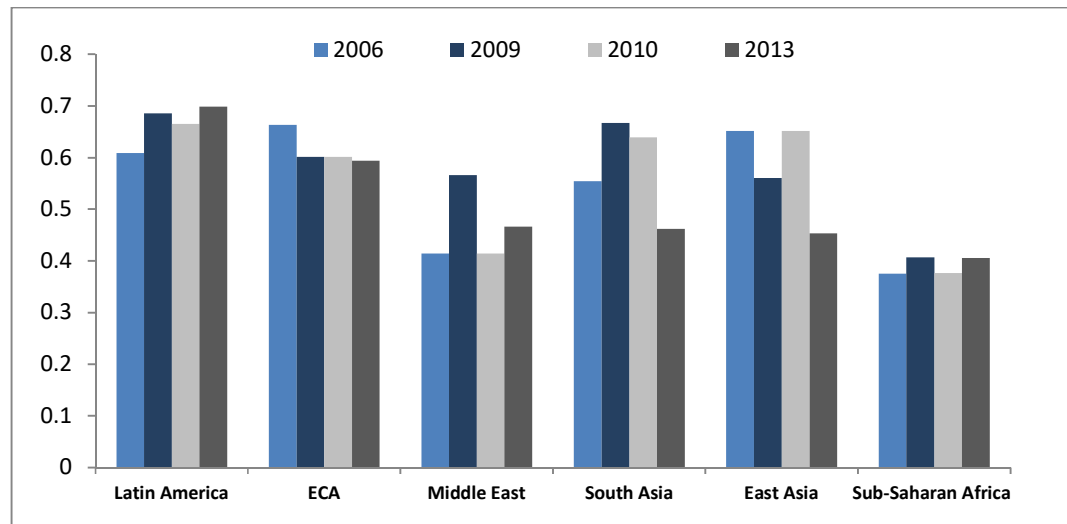
Figure 4.8 ECA firm-level index



The global financial crisis hit SMEs the most due their vulnerability to economic and financial instability. The firm-level index assesses the both large corporate's and SMEs financial access. The index performance was much better before the year of crisis for most of the ECA countries. The weakening of the economic activity was reflected particularly in the financial situation of the SMEs in forms of increased cost of getting finance. For the banks, it became costlier to attract international funding and they became more risk averse which resulted in risk aversion. Risk aversion in turn, resulted in tightening of credit standards and increase in interest rates. Also, SMEs had displayed significant increases in non-performing loan rates. Access to finance was one of the biggest challenges for SMEs before the crisis and post-crisis, the SMEs continued to face severe problems accessing finance.

With respect to firm level index, overall, ECA countries performed very well, all of them remained above 0.4 (for Russian Federation, the data is not available for 2013.). Croatia had the highest index results in 2006 and 2009; however, Bosnia, Montenegro, Kosovo and Turkey outpace Croatia in 2010 and in 2013. Azerbaijan and Tajikistan were the worst performers in ECA for 2013. In Tajikistan, the banking sector has been weak with high NPLs, low profitability, limited funding and liquidity restraints. The banking sector remained under pressure mainly due to the slowdown in the economy which was accompanied by the global financial crisis. Bad risk management policies in banks and major deficiencies in monitoring and regulating frameworks of the banks and the lack of efficient financial infrastructure put further pressure on the banking sector. This, in turn negatively affected the firm-level access in Tajikistan. The financial sector is not well developed in Azerbaijan. Banks dominate the financial sector. There is an extremely centralized banking system which is also described as a low competition environment. Banking sector penetration remains below the regional average, with around 30 percent assets-to-GDP ratio in 2013. The state has been actively involved in promotion of the improvement and deepening of the banking sector. Going forward, consequently, SME financing is likely to surge.

Figure 4.9 Regional firm-level index

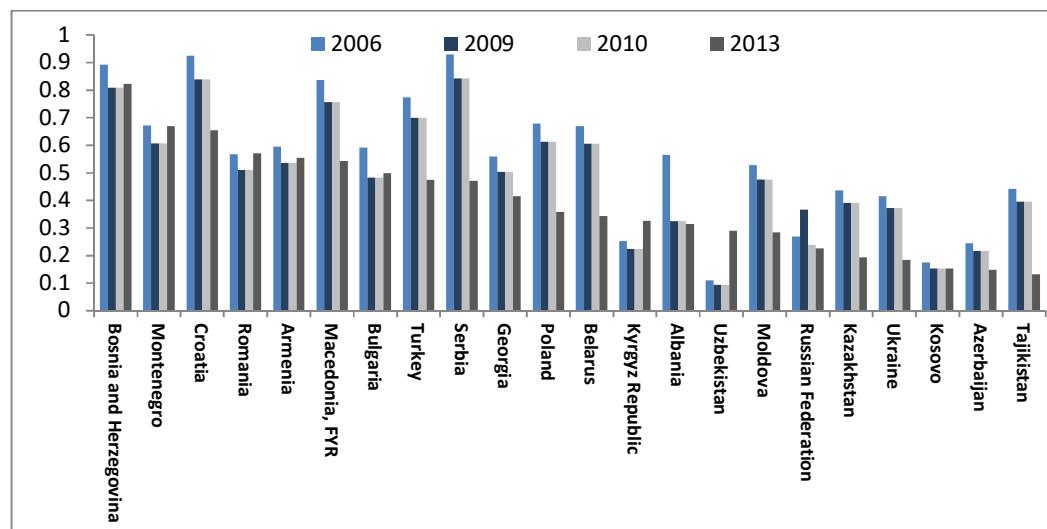


With respect to the regional performance, ECA had the second ranking for the years of analysis. Additionally, the indices have been above 0.6 in all four years. Although ECA

outpaced Latin America in 2006, after 2006 for the years that were covered by the table above, Latin America took over the first ranking. ECA was followed by Middle East with respect to the firm level inclusion. Firm level inclusion decreased slightly in ECA from 2006 to 2011.

Same with household index, ECA lagged behind LAC in later years (2010, 2013). However, as a region, it has a comparative advantage with respect to firm level financial inclusion. Bosnia, Montenegro, Kosovo, Turkey and EU accession countries played an important role in this ranking. The firms' share with a credit line is at 40 percent versus 46 percent in Latin America. However, the collateral requirements are still identified as a major concern for many SMEs. Some of the countries in the region have cumbersome regulations, while in some other countries the main issue was the deficiency of trustworthy information on credit (for example Tajikistan, Uzbekistan). The legal procedures in order to get the collateral in default cases are also extremely difficult particularly in Central Asian countries. These restrictions, partially, are being bypassed via the utilization of fast developing nontraditional sources of finance including leasing and factoring. This is particularly evident in Poland, Croatia and Turkey.

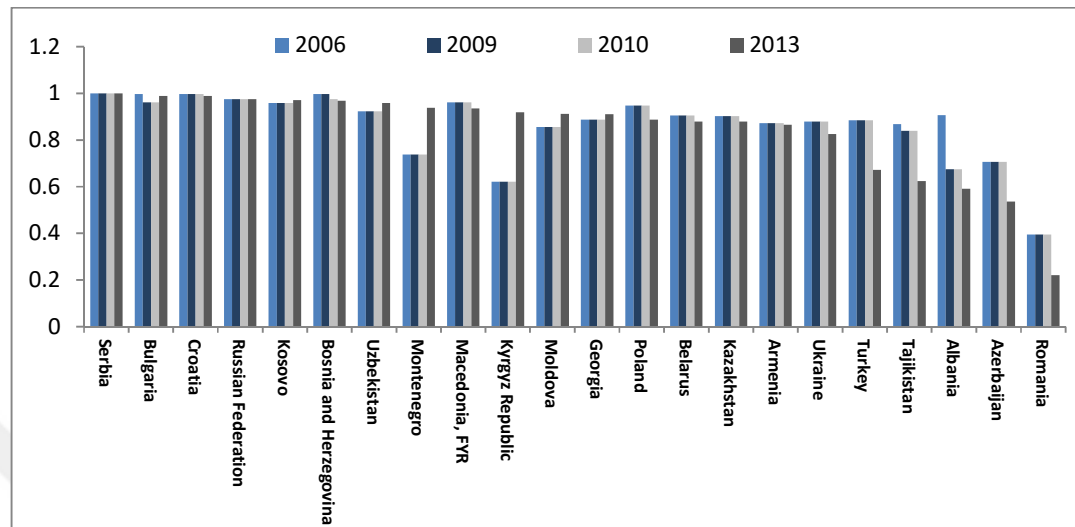
Figure 4.10 ECA firm-level index: firms with bank loan or line of credit



Balkan countries performed better than their counterparts in ECA region with respect to firms with bank loan or line of credit (particularly Bosnia, Montenegro, and Croatia). Although Serbia ranked highest in 2006, the firms' access to loans or line of credit

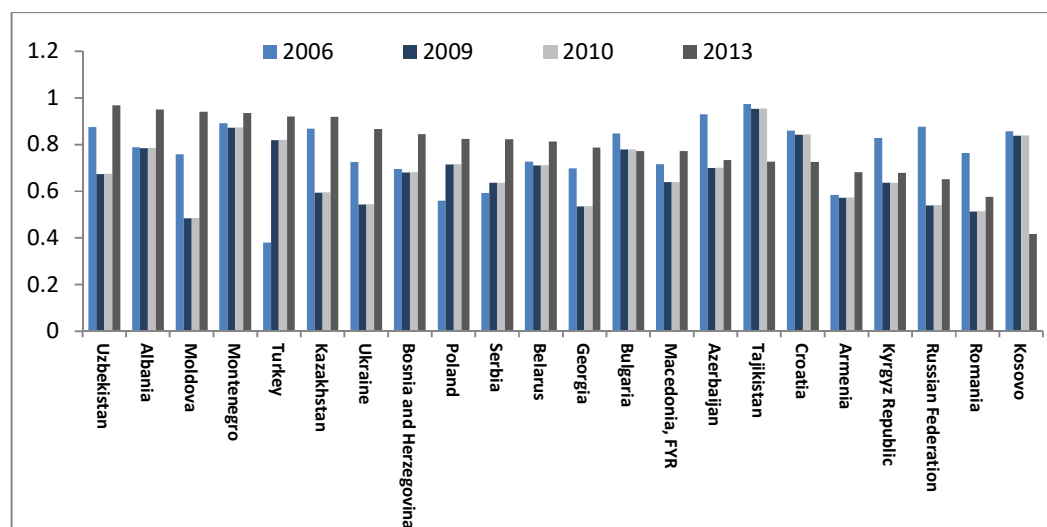
decreased from 2006 to 2013. Tajikistan, Azerbaijan and Kosovo are the worst performers in this category. For example, in Azerbaijan (according to the average of covered years) only 15 percent of SMEs have access to line of credit versus 18 percent of least developed countries, 45 percent of middle income countries. In these three countries, SMEs are mainly dependent on financing by themselves, while financing via bank loan or line of credit is the sole source of external finance as a result of undeveloped other financing structures. In Azerbaijan, according to the MSME Access to Finance Survey 2014 results, although 67 percent of the firms have a bank account, 14 percent of these firms have a line of credit or a bank loan. The firms do not apply for a loan mainly due to complexity of the application procedures, high collateral requirements. In Kosovo, most of the SMEs are not registered. Kosovo is a cash/ barter economy. The firms do not conduct their transactions by using the banking system. Additionally, SMEs do not have sufficient financial statements and/ or financial projections to apply for a loan. Many of them do not even have a proper credit history. Finally, most of the firms do not have adequate property to fulfil banks' collateral requirements. In sum, the abovementioned factors make it hard for most of the SMEs to have access to line of credit in Kosovo. In case of Tajikistan, although SMEs are private sector's major players, they face constraints in doing business and having access to line of credit. This is mainly due to lack of capital and weak banking system in Tajikistan. Microfinance institutions could not meet SMEs' financial necessities. In the worst performing countries, there is a need to simplify and to standardize the lending procedures for loan applications and on-going processes. Also, it is necessary to advance the market infrastructure. This could be done by facilitating the formation of a private credit bureau and by making sure that there is a sufficient regulatory framework to review these processes, to ensure safety of data and to protect consumer.

Figure 4.11 ECA firm-level index: firms with savings or checking account



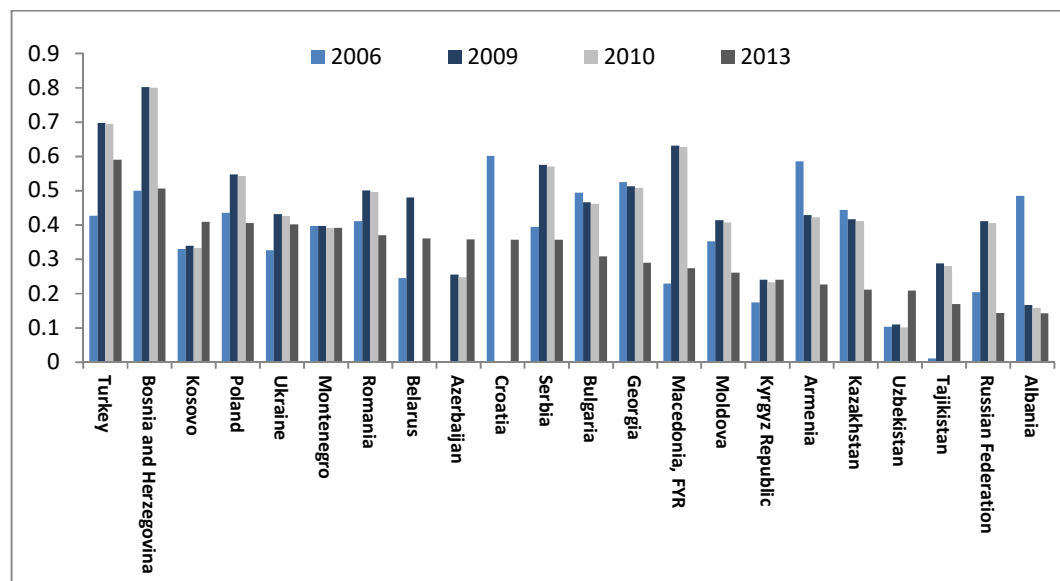
Overall in ECA, firms have access to savings or checking accounts. Serbia, Bulgaria and Croatia are the forerunners in this category within the region. Serbia was the best performer also within all countries. Albania, Azerbaijan and Romania remain under the regional average. In Azerbaijan and in Albania, the entrepreneurs face major challenges when it comes to access to finance. In Azerbaijan, 75 percent of the entrepreneurs find it difficult to seek operational financing.

Figure 4.12 ECA firm-level index: firms identifying access to finance as a major constraint



Uzbekistan performed the worst within ECA countries with respect to identifying access to finance as a major constraint. 40 percent of the firms identify access to finance as a major constraint versus 20 percent of ECA average. Uzbekistan does not have developed financial markets which could reduce the reliance on internal funding and funding from informal sources. There is a significant improvement with respect to this indicator for Kosovo. This is mainly due to agile government to make Kosovo more attractive country for doing business. Romania is the second-best performer according to this indicator. Romania had the highest number of reforms (four consecutive reforms) in getting credit from 2006 to 2015. Romania introduced government support namely de minimis scheme for SMEs which was built on a support program for young entrepreneurs and women entrepreneurs. Russian Federation also performed well with respect to this indicator. In Russian Federation, one third of the population is still underbanked. Also, population from the remote parts of the country is specifically unbanked given that they are costly for banks and not profitable to open branches in those regions. That said, there are many non-banking agents which helped Russian Federation to avoid the access constraint to some extent.

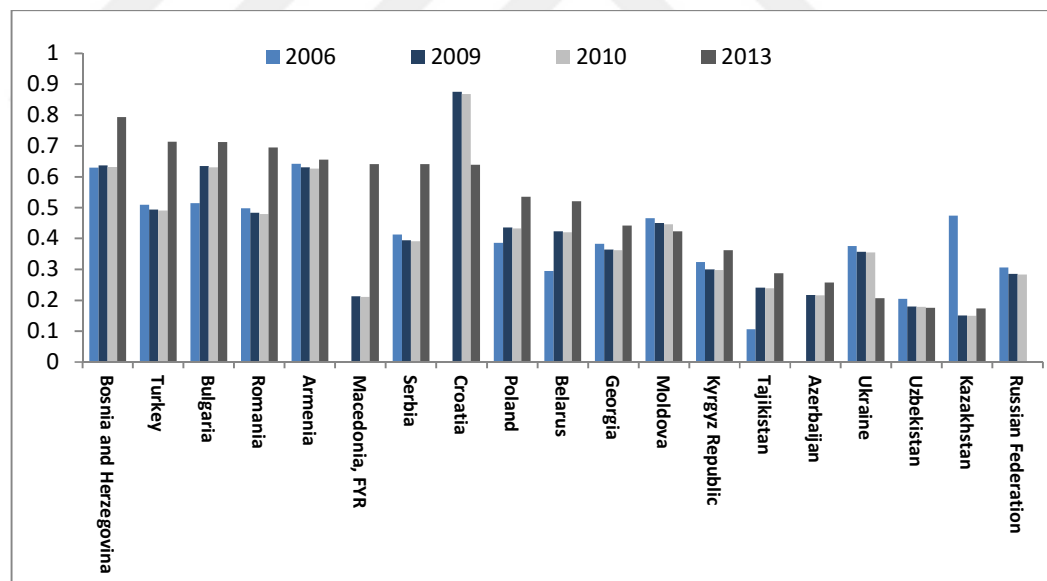
Figure 4.13 ECA firm-level index: firms using banks to finance investments



Firms use banks to finance their investments, which includes the purchase of fixed assets such as vehicles, machinery, buildings, and land, mostly in Turkey, Bosnia and Kosovo within ECA region. As explained earlier, there is a decreasing trend from 2006 to 2013

mainly due to the impact of financial crisis. After the financial crisis, it became significantly difficult for the small and medium sized firms (firms include small, medium and large sized firms but in most of the economies consist of small and medium sized firms) to receive funding from banks due to increased cost of funding and more conservative risk management policies of the banks. In Tajikistan, Russian Federation and Albania, firms remained in the low ranks when it comes to reaching out to banks for financing their investments. In Tajikistan and Russian Federation, there was a problem of lack of bank branches in rural areas. In Albania, there is a significant funding gap for bank lending mainly due to conservative approach of the banks. This is mainly due to high number of non-performing loans. Also, bank lending is mostly collateral based which increases the funding gap further in rural regions. Additionally, Albania's macro indicators have remained behind pre-crisis levels.

Figure 4.14 ECA firm-level index: firms using banks to finance working capital

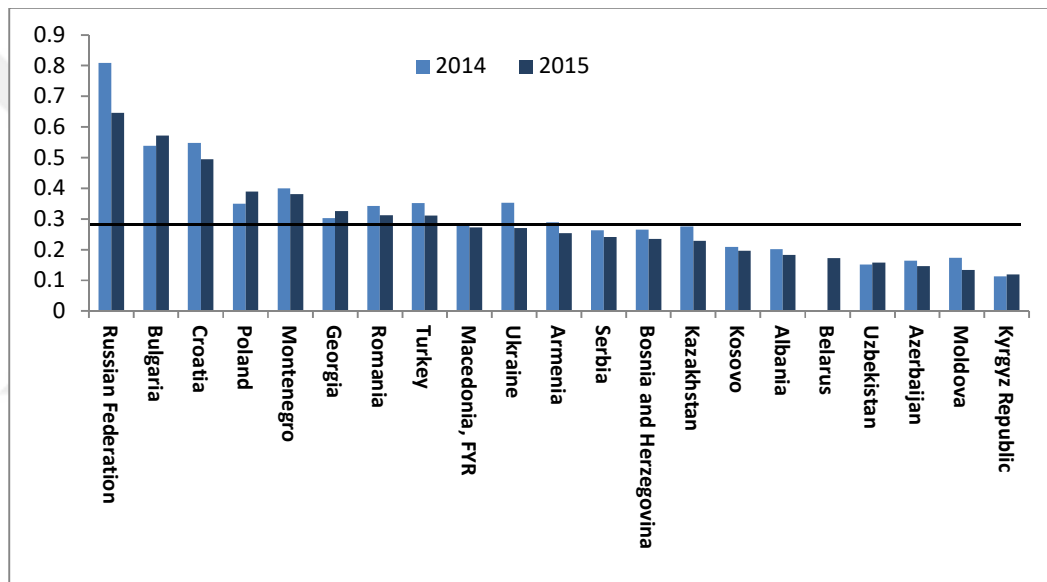


For working capital purposes, again Bosnia and Turkey are the two best performers. In Bosnia, there are many financial institutions compared to country's size. Most of these financial institutions work with the SMEs. Bosnia and Turkey are followed by two EU countries, namely Bulgaria and Romania, where the governments have been very supportive of lending particularly to small and medium sized firms. Also, both countries had the loan guarantees of European structural funds which helped SMEs to increase their

access to line of credit- which was also reflected in working capital. The worst performers are Uzbekistan, Kazakhstan and Russian Federation for this indicator. The reasons explained above for both Uzbekistan and Russian Federation hold for this indicator as well. In Kazakhstan, access to finance for firms remain subdued which is reflected in the limited usage of banks for working capital.

4.3.3. Access to Financial Institutions

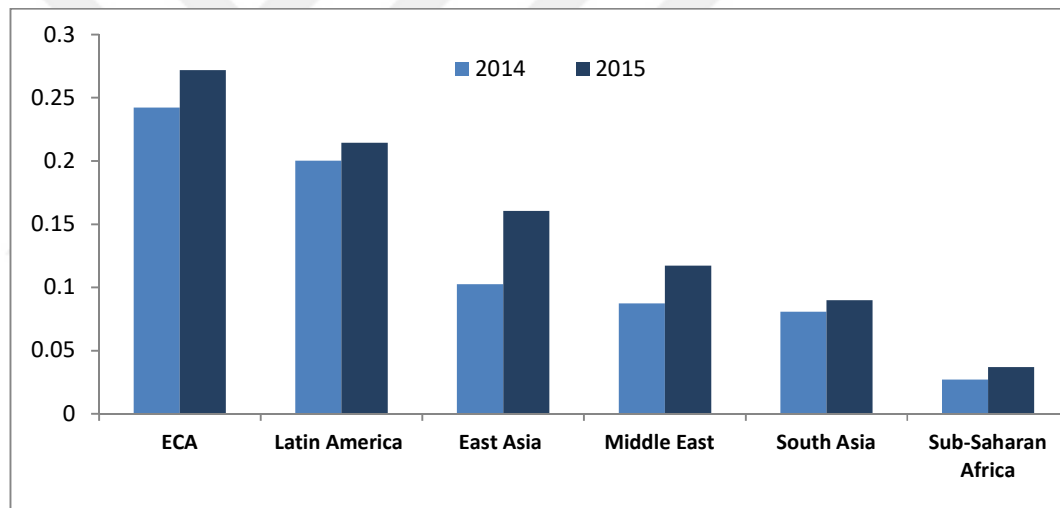
Figure 4.15 ECA access to financial institutions (FAS Index- 2014 and 2015)



Russia Federation ranks highest with respect to financial access. The authorities reacted rapidly with supporting the banking sector pertaining to the liquidity and capital levels. Even though there was no major crisis, the crisis had a significant structural effect. The publicly owned Russian banks increased their market share in the market while providing lending dynamically. The regional average is approximately 0.3. Armenia, Serbia, Bosnia, Kazakhstan, Kosovo, Albania, Belarus, Uzbekistan, Azerbaijan, Moldova and Kyrgyz Republic remained under the regional average for 2015. Azerbaijan, Moldova and Kyrgyz Republic were the worst performers in this category. The small Central Asian economies were not affected much from the global financial crisis particularly because of their frail linkages with European trade. They also had low access levels to global markets. In Kyrgyzstan, on the other hand, as a result of the political crisis, there was a noteworthy economic and financial disturbance and GDP growth slowed significantly

(less than 1 percent). Armenia, Moldova and Georgia were all significantly hit by the economic tremors in 2008; however, they managed to circumvent main banking crises. Georgia remained over the ECA average while Armenia and Moldova did not show the same performance related to the financial access indicator. Ukraine and Kazakhstan both remained under the ECA average. They both had main banking crises. The unavailability of the international funding resulted in the sharp depreciation of exchange rates. This also resulted in the appearance of the previous vulnerabilities in the banking sector. GDP was down by double digits in 2009, namely 14.5 percent in Ukraine while GDP growth slowed down to a mere 1.2 percent in Kazakhstan with resilient revenue stream from oil and gas.

Figure 4.16 Regional access to financial institutions



Different than the household inclusion and firm inclusion, ECA as a region has a much favorable position on financial access compared to other regions. Russian Federation, Bulgaria, Croatia and other accession countries lead this outcome. With respect to access, ECA outperformed the other five regions in both years 2014 and 2015 clearly. All of the regions displayed an improvement pertaining to this index. The highest improvements were recorded in East Asia and ECA.

5. CONCLUSION AND RECOMMENDATIONS

This study aimed at quantifying financial inclusion by formulating three different indices. These indices were divided into three categories namely access index, household-level inclusion and firm-level inclusion index. Based on Global Findex database and Enterprise Survey database collected by the World Bank, Financial Access Data collected by the IMF, the study introduced measures of household and firm level inclusion while placing ECA in a historical and cross-country perspective. It further aimed at shedding light on the impact of financial inclusion and growth while identifying determinants of financial inclusion. This dissertation aimed at contributing to literature by quantifying financial inclusion via index formation and by exploring macroeconomic impact of financial inclusion with a more detailed focus on ECA countries. The dissertation confirmed the previous studies which showed financial inclusion's contribution to multiple macroeconomic goals explicitly increasing growth and reducing inequality. The empirical results show that increased financial inclusion also increases growth and decreases inequality.

The empirical study can be enriched by adding a gender dimension and also by adding technology and digital finance indicators.

Access to finance particularly with respect to access to finance by women entrepreneurs has been a very popular topic lately. Microeconomic and sociological studies find that financial access by women helps society more generally. Studies showed that women are subject to more barriers than men in accessing finance. In sum, exclusion of women from finance jeopardizes growth significantly and it could further lead to increase in inequality. For example, there are approximately 1.3 million small and medium enterprises owned by women in ECA, accounting for more than 40 percent of the SMEs in the region. Mainly due to lack of collateral and limited financial literacy, women entrepreneurs had difficulty accessing finance via line of credit or other sources compared to male entrepreneurs. There is a huge untapped economic potential-without the much-needed capital, these women-owned enterprises in the ECA region are not able to run their businesses which could then be translated into increased growth. The gender gap is very

high in ECA where for example in Russian Federation nearly two-thirds of women-owned SMEs are not served by banks with the credit gap amounting to US\$11.5 billion. In Turkey, women owned enterprises comprise 40 percent of SMEs with only 15 percent having access to finance. These gaps could be further analyzed as more gender disaggregated indicators are introduced to the indices that are formulated in this dissertation. Global Findex database disaggregated account ownership (%; ages 15+); formal savings (%; ages 15+) and formal credit (%; ages 15+). 2014 data reveals a noteworthy gap in account ownership, savings, and credit tendencies. International Monetary Fund also released gender disaggregated Financial Access Survey in March 2018. The 2016 FAS contains a pilot to include the financial access gender data gap while supporting the IMF's studies of economic empowerment of women in increasing growth and decreasing income inequality. However, only 28 countries participated in this pilot study and half of these participant economies had access to gender disaggregated information. Therefore, it might be challenging to find the data to include gender dimension in future analysis.

The second aspect that could improve the study would be including the role of technology and digital banking while quantifying access to finance. To reach new customers, financial institutions started to offer digital financial services to underbanked segments of the society. Given that digital financial services result in the increase in accessibility and affordability of financial services, many cash based transactions were shifted to formal financial services. Technology is playing a vital role in the expansion of financial inclusion. Digital finance which includes mobile banking, electronic payments could considerably increase the usage and access of financial services by the poor and unserved population which then could result in macroeconomic growth and reduction of inequality. Digital financial services, in other words, 'fintech' taps the increase of global usage of mobile phones. By using mobile phones, access to financial services by remote populations and small businesses is realized at lower cost and risk levels. The facts include: (i) digital IDs eases opening an account; (ii) cash payment digitization introduces more people to the concept of transaction accounts; and, (iii) financial services based on mobile phones bring access to remote regions. Therefore, the impact of the usage of

digital financial services is worth examining while analyzing access to finance and its impact on growth and inequality.

Unlike the supply-side data, the demand-side data is only available for a limited time horizon. Demand-side data is costlier and conducted less frequently. Based on individual-level surveys, World Bank's Findex database was available only for two years (2011 and 2014). It is supposed to be conducted every three years so the next available one will be for year 2017. The database only covers 140 countries. Additionally, World Bank's Enterprise Surveys were not conducted annually in each country of coverage due to the high cost associated to them. The empirical study could be improved by the availability of survey data for more years.

Finally, the empirical study could be further improved by having other proxies for quantifying inequality in addition to the Gini Coefficient as a proxy to measuring inequality. Gini coefficient is the most extensively utilized inequality measure. The caveat is that there are limited data points for this indicator and this puts a constraint on the results of the regression analysis pertaining to income inequality. There is another simpler but more popular version of measuring income inequality which is called the decile dispersion ratio. This ratio is calculated by dividing the average income of the richest 10 percent of the population by the average income of the poorest 10 percent of the population. This ratio can also be calculated by using the 5 percent or the 95th percentile. The regressions could be run by using this simpler calculation of inequality to get more robust regression results.

REFERENCES

Books

- Bagehot, Walter. *Lombard Street*. Homewood, IL: Richard D. Irwin, 1973.
- Baltagi, B. H. *Econometric analysis of panel data*. England: John Wiley & Sons, 2001.
- Carbo, S., Gardner, E. and Molyneux, P. *Financial Exclusion*. London: Macmillan, Palgrave, 2005.
- Judge, G.G., Hill, R.C., Griffiths, W.E., Lutkepohl, H., & Lee, T.-C. *Introduction to the Theory and Practice of Econometrics*. Canada: John Wiley&Sons, 1988.
- Levine, Ross. "Finance and Growth: Theory and Evidence." In *Handbook of Economic Growth*, edited by Philippe Aghion and Steven Durlauf, 865–934. New York: Elsevier, 2005.
- OECD/JRC. *Handbook on constructing composite indicators*. Methodology and user guide. Paris: OECD Publisher, 2008.
- Shaw, Edward. *Financial Deepening in Economic Development*. New York: Oxford University Press, 1973.
- Sinclair, T. "The New Masters of Capital: American bond rating agencies and the politics of creditworthiness." Ithaca, N.Y.: Cornell University Press, 2005.

Periodicals

- Barro, Robert J. "Inequality and Growth in a Panel of Countries." *Journal of Economic Growth* 5 (2000): 5-32.
- Batalgi, B.H. & Chang, Y. "Incomplete panels: A comparative study of alternative estimators for the unbalanced one-way error component regression model." *Journal of Econometrics* 62, no. 2 (1994): 67-89.
- Beck, Thorsten and Ross Levine. "Stock Markets." *Journal of Banking and Finance* *Stock Markets, Banks and Growth: Panel Evidence* 28, no. 3 (2004): 423-42.
- Beck, Thorsten, Asli Demirguc-Kunt, Ross Levine. "Finance, inequality and the poor." *Journal of Economic Growth* 12 (2007): 27-49.
- Beck, Thorsten, Demirguc-Kunt, Asli and Maria S. Martinez Peria. "Reaching out: Access to and use of banking services across countries." *Journal of Financial Economics* 85 (2007): 234-266.
- Brune, L., X. Gine, J. Goldberg, and D. Yang. "Facilitating Savings for Agriculture: Field Environmental Evidence from Malawi." *Economic Development and Cultural Change* 64, no. 2 (2016): 187-220.
- Burgess, R. and R. Panda. "Do Rural Banks Matter? Evidence from the Indian Social Banking Experiment." *American Economic Review* 95, no. 3 (2005): 780-795.
- De Gregorio, Jose, and Pablo Guidotti. "Financial Development and Economic Growth." *World Development* 23, no. 3 (1995): 433-48.
- Demetriades, Panicos and Khaled Hussein. "Does Financial Development Cause Economic Growth? Time-series evidence from 16 Countries." *Journal of Development Economics*, 1996.
- Hausman, J.A., & Taylor, W.E. "Panel data and unobservable individual effects." *Econometrica* 49 (1981): 1377-1398.
- Honohan, P. "Cross-Country Variation in Household Access to Financial Services." *Journal of Banking and Finance* 32 (2008): 2493-2500.
- Jacobs, Rowena, Smith, Peter and Maria Goddard. "Measuring performance: an examination of composite performance indicators." *Centre for Health Economics*, 2004: Technical Paper Series 29.
- King, Robert, and Ross Levine. "Finance and Growth: Schumpeter Might Be Right." *The Quarterly Journal of Economics* 108, no. 3 (1993): 717-37.
- King, Robert, and Ross Levine. "Finance and Growth: Schumpeter Might Be Right." *The Quarterly Journal of Economics* 108, no. 3 (1993): 717-37.

- Kochar, A. "The Distributive Consequences of Social Banking: A Microempirical Analysis of the Indian Experience." *Economic Development and Cultural Change* 59, no. 2 (2011): 251-280.
- Levine, Ross, Norman Loayza, and Thorsten Beck. "Finance and the Sources of Growth." *Journal of Financial Economics* 58 (2000): 261–300.
- Leyshon, A., Thrift, N. "The Restructuring of the UK Financial Services Industry in the 1990s - a Reversal of Fortune." *Journal of Rural Studies* 9 (1995): 223-241.
- Loayza, Norman, and Roman Ranciere. "Financial Development, Financial Fragility, and Growth." *Journal of Money, Credit and Banking* 38 (2006): 1051–76.
- Mookerjee, Rajen, Paul Kalipioni. "Availability of financial services and income inequality." *Emerging Markets Review* 11 (2010): 404-408.
- Nili, M., and M. Rastad. "Addressing the Growth Failure of the Oil Economies: The Role of Financial Development." *Quarterly Journal of Economics and Finance* 46, no. 5 (2007): 726– 40.
- Rousseau, Peter, and Paul Wachtel. "What is Happening to the Impact of Financial Deepening on Economic Growth." *Economic Inquiry* 49, no. 1 (2011): 276-88.
- Townsend, Robert M., Kenichi Ueda. "Financial Deepening, Inequality, and Growth: A Model-Based Quantitative Evaluation." *Review of Economic Studies* 73 (2006): 251-293.

Other Sources

- Aizenman, Joshua, Yothin Jinjarak, and Donghyun Park. "Financial Development and Output Growth in Developing Asia and Latin America: A Comparative Sectoral Analysis." Cambridge, MA: National Bureau of Economic Research, 2015.
- Allen, Franklin, Asli Demirguc-Kunt, Leora Klapper, Maria Soledad Martinez Peria. "The Foundations of Financial Inclusion: Understanding Ownership and Use of Formal Accounts." *Policy Research Working Paper WPS6290*. Washington D.C.: World Bank, 2012.
- Allen, Franklin, Elena Carletti, Robert Cull, Jun Quian, Lemma Senbet and Patricio Balenzuela. "The African Financial Development and Financial Inclusion Gap." Pennsylvania: Wharton Financial Institutions Center University of Pennsylvania, 2013.
- Alter, Adrian and Yontcheva, Boriana. "Financial Inclusion and Development in the CEMAC." Washington D.C.: International Monetary Fund, 2015.
- Amidžić, G. A. Massara, and A. Mialou. "Assessing Countries' Financial Inclusion Standing—A New Composite Index." Washington D.C.: International Monetary Fund, 2014.
- Arcand, Jean-Louis, Enrico Berkes, and Ugo Panizza. "Too Much Finance?" Washington D.C.: International Monetary Fund, 2012.
- Aslan Goksu, Deléchat Corinne, Newiak Monique, and Yang Fan. "Inequality in Financial Inclusion and Income Inequality." Washington D.C.: International Monetary Fund, 2017.
- Aslan Goksu, Delechat Corinne, Newiak Monique, and Yang Fan. "Inequality in Financial Inclusion, Gender Gaps, and Income Inequality ." Washington D.C.: International Monetary Fund, 2017.
- Barajas, Adolfo, Ralph Chami, and Seyed Reza Yousefi. "The Finance and Growth Nexus Re-examined: Do All Countries Benefit Equally?" Washington, D.C.: International Monetary Fund, 2013.
- Barth, James R., Gerard, Jr., Caprio, and Ross Levine. "Bank Regulation and Supervision in 180 Countries from 1999 to 2011." Cambridge, MA: National Bureau of Economic Research, 2013.
- Batuo, M.E., Guidi, F., Mlambo, K. "Financial development and income inequality: evidence from African countries." Tunis, Tunisia: African Development Bank, 2010.
- Beck, Thorsten, Asli Demirguc-Kunt. "Access to Finance: An Unfinished Agenda." *The World Bank Economic Review* 22 (2008): 383-396.

- Buera Francisco J., Kaboski Joseph P., Shin Yongseok. "The Macroeconomics of Finance." Cambridge, MA: National Bureau of Economic Research, 2012.
- Camara Noelia, Tuesta David. "Measuring Financial Inclusion: A Multidimensional Index." Madrid: BBVA, 2014.
- Dabla-Norris Era, Yixi Deng, Anna Ivanova, Izabela Karpowicz, Filiz Unsal, Eva VanLeemput, and Joyce Wong. "Financial Inclusion: Zooming in on Latin America." Washington D.C.: International Monetary Fund, 2015.
- Dabla-Norris, Era, Kalpana Kochhar, Hujin Suphaphiphat, Frantisek Ricka, Evridiki Tsounta. "Causes and Consequences of Income Inequality: A Global Perspective." Washington D.C.: International Monetary Fund, 2015.
- Dabla-Norris, Era, Yan Ji, Robert M. Townsend, D. Filiz Unsal. "Distinguishing Constraints on Financial Inclusion and Their Impact on GDP, TFP, and Inequality." Cambridge, MA: National Bureau of Economic Research, 2015.
- Dabla-Norris, Era, Yan Ji, Robert Townsend, and D. Filiz Unsal. "Identifying Constraints to Financial Inclusion and Their Impact on GDP and Inequality: A Structural Framework for Policy." Washington, D.C.: International Monetary Fund, 2015.
- Demirguc-Kunt, Asli, Leora Klapper. "Measuring Financial Inclusion: The Global Findex Database." Washington D.C.: World Bank, 2012.
- Demirgüç-Kunt, Asli, Leora Klapper, Dorothe Singer, and Peter Van Oudheusden. "The Global Findex Database 2014: Measuring Financial Inclusion around the World." Washington, D.C.: World Bank , 2015.
- Gould David Michael, Melecky Martin. "Risks and. Returns: Managing Financial Trade-Offs for Inclusive Growth in Europe and Central Asia." Washington D.C.: World Bank, 2017.
- Honohan, Patrick. "Cross-Country Variation in Household Access to Financial Services." Washington D.C.: World Bank , 2007.
- Indicators, World Bank Development. "Financial Development and Income Inequality: Evidence from African Countries." Munich: Munich Personal RePEc , 2010.
- Laeven, Luc, and Fabian Valencia. "Systemic Banking Crises Database: An Update." Washington, D.C.: International Monetary Fund, 2012.
- McKinnon, Ronald. *Money and Capital in Economic Development*. Washington D.C.: The Brookings Institution, 1973.
- Michael, Freudenberg. "Composite indicators of country performance: a critical assessment." Paris: OECD, 2003.
- Panagariya, A. "Bank branch expansion and poverty reduction: a Comment." New York: Columbia University, 2006.

- Park, Cyn-Young and Mercado Rogelio. "Financial inclusion, poverty and income inequality in developing Asia." Tokyo: Asian Development Bank, 2015.
- Rajan, R. " Financial Inclusion—Technology, Institutions, and Policies. Keynote Address at the National Association of Software and Services Companies ." Mumbai: Indian Leadership Forum , 2014.
- Rojas-Suarez, L. " Access to Financial Services in Emerging Powers: Facts, Obstacles, and Policy Implications." Paris: OECD, 2010.
- Sahay, Ratna, Martin Čihák, Papa N'Diaye, Adolfo Barajas, Ran Bi, Diana Ayala, Yuan Gao, Annette Kyobe, Lam Nguyen, Christian Saborowski, Katsiaryna Svirydenka, and Seyed Reza Yousefi. "Rethinking Financial Deepening: Stability and Growth in Emerging Markets." Washington D.C.: International Monetary Fund, 2015.
- Sahay, Ratna, Martin Cihak, Papa N'Diaye, Adolfo Barajas, Srobona Mitra, Annette Kyobe, Yen Nian Mooi, Seyed Reza Yousefi. "Financial Inclusion: Can It Meet Multiple Macroeconomic Goals." Washington D.C.: International Monetary Fund, 2015.
- Sarma, Mandira. "Index of Financial Inclusion." New Delhi: Indian Council for Research on International Economic Relations , 2008.
- World, Bank. "Global Financial Development Report- Financial Inclusion." Washington D.C.: World Bank, 2015.
- World, Bank. *Global Financial Development Report: Financial Inclusion*. Washington D.C.: World Bank Group, 2014.
- World, Bank. *World Bank Development Indicators*. Washington D.C.: World Bank Group, 2016.

APPENDICES



Appendix-1: Countries included in the 2014 Global Findex Database

Afghanistan	Czech Republic	Kyrgyz Republic	Saudi Arabia
Albania	Denmark	Latvia	Senegal
Algeria	Dominican Republic	Lebanon	Serbia
Angola	Ecuador	Lithuania	Sierra Leone
Argentina	Egypt, Arab Rep.	Luxembourg	Singapore
Armenia	El Salvador	Macedonia, FYR	Slovak Republic
Australia	Estonia	Madagascar	Slovenia
Austria	Ethiopia	Malawi	Somalia
Azerbaijan	Finland	Malaysia	South Africa
Bahrain	France	Mali	Spain
Bangladesh	Gabon	Malta	Sri Lanka
Belarus	Georgia	Mauritania	Sudan
Belgium	Germany	Mauritius	Sweden
Belize	Ghana	Mexico	Switzerland
Benin	Greece	Moldova	Taiwan, China
Bhutan	Guatemala	Mongolia	Tajikistan
Bolivia	Guinea	Montenegro	Tanzania
Bosnia	Haiti	Myanmar	Thailand
Botswana	Honduras	Nambia	Togo
Brazil	Hong Kong	Nepal	Tunisia
Bulgaria	Hungary	Netherlands	Turkey
Burkina Faso	India	New Zealand	Turkmenistan
Burundi	Indonesia	Nicaragua	Uganda
Cambodia	Iran, Islamic Rep.	Niger	Ukraine
Cameroon	Iraq	Nigeria	UAE
Canada	Ireland	Norway	United Kingdom
Chad	Israel	Pakistan	United States
Chile	Italy	Panama	Uruguay
China	Jamaica	Peru	Uzbekistan
Colombia	Japan	Philippines	Venezuela, RB
Congo, Dem. Rep.	Jordan	Poland	Vietnam
Congo, Rep.	Kazakhstan	Portugal	West Bank
Costa Rica	Kenya	Puerto Rico	Yemen, Rep.
Cote d'Ivoire	Korea, Rep.	Romania	Zambia
Croatia	Kosovo	Russia	Zimbabwe
Cyprus	Kuwait	Rwanda	

Appendix-2: Global Findex Questions

1 An account can be used to save money, to make or receive payments, or to receive wages or financial help. Do you, either by yourself or together with someone else, currently have an account at any of the following places: a bank, [insert all financial institutions], or another type of formal financial institution? 1 Yes 2 No 3 (DK) 4 (Refused)	8 Please tell me whether each of the following is A REASON why you, personally, DO NOT have an account at a bank or another type of formal financial institution. (Read and rotate A-I) Is it ... ?* A Because financial institutions are too far away B Because financial services are too expensive C Because you don't have the necessary documentation (identity card, wage slip, etc.) D Because you don't trust financial institutions E Because of religious reasons F Because you don't have enough money to use financial institutions G Because someone else in the family already has an account H Because you cannot get an account I Because you have no need for financial services at a formal institution 1 Yes 2 No 3 (DK) 4 (Refused)
2 (A/An [insert local terminology for ATM/debit card]) is a card connected to an account at a financial institution that allows you to withdraw money, and the money is taken out of THAT ACCOUNT right away. Do you, personally, have (a/an [insert local terminology for ATM/debit card])? 1 Yes 2 No 3 (DK) 4 (Refused)	9 In the past 12 months, has money been DEPOSITED into your personal account(s)? This includes cash or electronic deposits, or any time money is put into your account(s) by yourself, an employer, or another person or institution.* 1 Yes 2 No 3 (DK) 4 (Refused)
3 Is this [insert local terminology for ATM/debit card] connected to an account with your name on it?* 1 Yes 2 No 3 (DK) 4 (Refused)	10 In a typical MONTH, about how many times is money DEPOSITED into your personal account(s): one or two times per month, three or more times per month, or, in a typical month, is money NOT deposited into your account(s)?* 1 One or two times per month 2 Three or more times per month 3 Money is not deposited in a typical month 4 (DK) 5 (Refused)
4 Have you, personally, used your [insert local terminology for ATM/debit card] to DIRECTLY make a purchase in the past 12 months?* 1 Yes 2 No 3 (DK) 4 (Refused)	11 In the past 12 months, has money been TAKEN OUT of your personal account(s)? This includes cash withdrawals in person or using your [insert local terminology for ATM/debit card], electronic payments or purchases, checks, or any other time money is removed from your account(s) by yourself or another person or institution.* 1 Yes 2 No 3 (DK) 4 (Refused)
5 A credit card is a card that allows you to BORROW money in order to make payments or buy things, and you can pay the balance off later. Do you, personally, have a credit card? 1 Yes 2 No 3 (DK) 4 (Refused)	12 In a typical MONTH, about how many times is money TAKEN OUT of your personal account(s): one or two times per month, three or more times per month, or, in a typical month, is money NOT taken out of your account(s)?* 1 One or two times per month 2 Three or more times per month 3 Money is not taken out in a typical month 4 (DK) 5 (Refused)
6 Have you used your credit card in the past 12 months?* 1 Yes 2 No 3 (DK) 4 (Refused)	
7 Aside from (a/an [insert local terminology for ATM/debit card]) or a credit card, do you have any other plastic card that you can use to make payments or purchases AT A VARIETY OF PLACES? 1 Yes 2 No 3 (DK) 4 (Refused)	

Source: Global Findex database.

13	When you need to GET CASH FROM your account(s), how do you USUALLY get it? Do... ?*	19	In the PAST 12 MONTHS, have you, personally, saved or set aside any money for any reason?*
1	You get it at an ATM	1	Yes
2	You get it over the counter in a branch of your financial institution	2	No
3	You get it from a bank agent who works at a store or comes to your home	3	(DK)
4	You get it some other way	4	(Refused)
5	(Do not need to get cash)	20	Do you, by yourself or together with someone else, currently have a loan you took out from a bank or another type of formal financial institution to purchase a home, an apartment, or land?
6	(DK)	1	Yes
7	(Refused)	2	No
14	In the PAST 12 MONTHS, have you ever made a transaction with money FROM YOUR ACCOUNT at a bank or another type of formal financial institution using a MOBILE PHONE? This can include using a MOBILE PHONE to make payments, buy things, or to send or receive money.*	3	(DK)
1	Yes	4	(Refused)
2	No	21	In the PAST 12 MONTHS, have you, by yourself or together with someone else, borrowed any money from any of the following sources? (Read A-D)
3	(DK)	A	Have you borrowed from a bank, [insert all financial institutions], or another type of formal financial institution? This does NOT include credit cards.
4	(Refused)	B	Have you borrowed from a store by using installment credit or buying on credit?
15	In the past 12 months, have you personally used a mobile phone to pay bills or to send or receive money using a service such as [insert local example of mobile money from GSMA database, like M-PESA]?*	C	Have you borrowed from family, relatives, or friends?
1	Yes	D	Have you borrowed from another private lender (for example, a/an [insert country-specific examples of private lenders, i.e., loan shark, payday lender, or pawn shop])?
2	No	1	Yes
3	(DK)	2	No
4	(Refused)	3	(DK)
16	In the PAST 12 MONTHS, have you, personally, made payments on bills or bought things online using the Internet?	4	(Refused)
1	Yes	22	In the PAST 12 MONTHS, have you, by yourself or together with someone else, borrowed money for any of the following reasons? (Read A-C)
2	No	A	Have you borrowed for education or school fees?
3	(DK)	B	Have you borrowed for health or medical purposes?
4	(Refused)	C	Have you borrowed to start, operate, or grow a business or farm?
17	In the PAST 12 MONTHS, have you, personally, saved or set aside any money for any of the following reasons? How about ... ? (Read A-C)	1	Yes
A	To start, operate, or grow a business or farm	2	No
B	For old age	3	(DK)
C	For education or school fees	4	(Refused)
1	Yes	23	Have you, by yourself or together with someone else, borrowed money from any source for any reason in the PAST 12 MONTHS?*
2	No	1	Yes
3	(DK)	2	No
4	(Refused)	3	(DK)
18	In the PAST 12 MONTHS, have you, personally, saved or set aside any money by... ? (Read A-B)	4	(Refused)
A	Using an account at a bank or another type of formal financial institution	24	Now, imagine that you have an emergency and you need to pay [insert 1/20 of GNI per capita in local currency]. How possible is it that you could come up with [insert 1/20 of GNI per capita in local currency] within the NEXT MONTH? Is it very possible, somewhat possible, not very possible, or not at all possible?
B	Using an informal savings club (like [insert local example]), or a person outside the family	1	Very possible
1	Yes	2	Somewhat possible
2	No	3	Not very possible
3	(DK)	4	Not at all possible
4	(Refused)	5	(DK)
		6	(Refused)

25 What would be the MAIN source of money that you would use to come up with [insert 1/20 of GNI per capita in local currency] within the NEXT MONTH? *

- 1 Savings
- 2 Family, relatives, or friends
- 3 Money from working or a loan from an employer
- 4 A credit card or borrowing from a formal financial institution
- 5 An informal private lender or pawn house
- 6 Some other source
- 7 (DK)
- 8 (Refused)

26 Have you, personally, GIVEN or SENT any of your MONEY to a relative or friend living in a different area INSIDE (country where survey takes place) in the PAST 12 MONTHS? This can be money you brought yourself or sent in some other way.

- 1 Yes
- 2 No
- 3 (DK)
- 4 (Refused)

27 In the PAST 12 MONTHS, have you, personally, GIVEN or SENT money to a relative or friend living in a different area inside (country where survey takes place) in any of the following ways? (Read A-D)*

- A** You handed cash to this person or sent cash through someone you know.
- B** You sent money through a bank or another type of formal financial institution (for example, at a branch, at an ATM, or through direct deposit into an account).
- C** You sent money through a mobile phone.
- D** You sent money through a money transfer service.

- 1 Yes
- 2 No
- 3 (DK)
- 4 (Refused)

28 Have you, personally, RECEIVED any MONEY from a relative or friend living in a different area INSIDE (country where survey takes place) in the PAST 12 MONTHS, including any money you received in person?

- 1 Yes
- 2 No
- 3 (DK)
- 4 (Refused)

29 In the PAST 12 MONTHS, have you, personally, RECEIVED money from a relative or friend living in a different area inside (country where survey takes place) in any of the following ways? (Read A-D)*

- A** You were handed cash by this person or by someone you know.
- B** You received money through a bank or another type of formal financial institution (for example, at a branch, at an ATM, or through direct deposit into an account).
- C** You received money through a mobile phone.
- D** You received money through a money transfer service.

- 1 Yes
- 2 No
- 3 (DK)
- 4 (Refused)

30 In the PAST 12 MONTHS, have you, personally, made regular payments for electricity, water, or trash collection?

- 1 Yes
- 2 No
- 3 (DK)
- 4 (Refused)

31 In the PAST 12 MONTHS, have you, personally, made payments for electricity, water, or trash collection in any of the following ways? (Read A-C)*

- A** You made a payment using cash.
- B** You made a payment directly from an account (for example, using (a/an [insert local terminology for ATM/debit card]), a bank transfer, or a check).
- C** You made a payment through a mobile phone.

- 1 Yes
- 2 No
- 3 (DK)
- 4 (Refused)

32 In the PAST 12 MONTHS, have you, personally, made regular payments for school fees?

- 1 Yes
- 2 No
- 3 (DK)
- 4 (Refused)

33 In the PAST 12 MONTHS, have you, personally, made payments for school fees in any of the following ways? (Read A-C)*

- A** You made a payment using cash.
- B** You made a payment directly from an account (for example, using a debit card, a bank transfer, or a check).
- C** You made a payment through a mobile phone.

- 1 Yes
- 2 No
- 3 (DK)
- 4 (Refused)

34 Have you received any money from an employer or boss, in the form of SALARY OR WAGES, for doing work in the PAST 12 MONTHS? Please do not consider any money you received directly from clients or customers.

- 1 Yes
- 2 No
- 3 (DK)
- 4 (Refused)

35 In the PAST 12 MONTHS, have you been employed by the government, military, or public sector?*

- 1 Yes
- 2 No
- 3 (DK)
- 4 (Refused)

36 In the PAST 12 MONTHS, has an employer or boss paid your salary or wages in any of the following ways? (Read A-D)* A You received payments DIRECTLY in cash. B You made a payment directly from an account (for example, using (a/an (insert local terminology for ATM/debit card)), a bank transfer, or a check). C You received payments to a card. D You received payments through a mobile phone. 1 Yes 2 No 3 (DK) 4 (Refused)	41 After your payment from the government is transferred into an account, do you usually withdraw or transfer ALL OF THE MONEY out of the account RIGHT AWAY, or do you withdraw or transfer the money over time as you need it?* 1 All of the money right away 2 Over time as needed 3 (DK) 4 (Refused)
37 After your payment from an employer is transferred into an account, do you usually withdraw or transfer ALL OF THE MONEY out of the account RIGHT AWAY, or do you withdraw or transfer the money over time as you need it?* 1 All of the money right away 2 Over time as needed 3 (DK) 4 (Refused)	42 Which of the following statements best describes the account that you use to receive payments from the government?* 1 You had THIS ACCOUNT before you began receiving payments from the government. 2 You had AN account before, but THIS account was opened so you could receive payments from the government. 3 This was your first account, and it was opened so you could receive payments from the government. 4 (DK) 5 (Refused)
38 Which of the following statements best describes the account that you use to receive payments from an employer?* 1 You had THIS ACCOUNT before you began receiving payments from an employer. 2 You had AN account before, but THIS account was opened so you could receive payments from an employer. 3 This was your first account, and it was opened so you could receive payments from an employer. 4 (DK) 5 (Refused)	43 In the PAST 12 MONTHS, have you personally RECEIVED money from any source for the sale of your or your family's agricultural products, crops, produce, or livestock? 1 Yes 2 No 3 (DK) 4 (Refused)
39 Have you, personally, RECEIVED any financial support from the government in the PAST 12 MONTHS? This money could include payments for educational or medical expenses, unemployment benefits, subsidy payments, or any kind of SOCIAL BENEFITS. Please do NOT include wages or any payments related to work. 1 Yes 2 No 3 (DK) 4 (Refused)	44 In the PAST 12 MONTHS, have you received money for the sale of your or your family's agricultural products, crops, produce, or livestock in any of the following ways? (Read A-C)* A You received payments DIRECTLY in cash. B You received payments DIRECTLY into an account at a bank or another type of formal financial institution. C You received payments through a mobile phone. 1 Yes 2 No 3 (DK) 4 (Refused)
40 In the PAST 12 MONTHS, have you received money from the government in any of the following ways? (Read A-D)* A You received payments DIRECTLY in cash. B You received payments DIRECTLY into an account at a bank or another type of formal financial institution. C You received payments to a card. D You received payments through a mobile phone. 1 Yes 2 No 3 (DK) 4 (Refused)	

Appendix-3: Countries included in the 2013 Enterprise Survey

Afghanistan	Ecuador	Mauritius	Syria
Albania	Egypt	Mexico	Tajikistan
Algeria	El Salvador	Micronesia	Tanzania
Angola	Eritrea	Moldova	Thailand
Antigua	Estonia	Mongolia	TimorLeste
Argentina	Ethiopia	Montenegro	Togo
Armenia	Fiji	Morocco	Tonga
Azerbaijan	Gabon	Mozambique	Trinidad
Bahamas	Gambia	Myanmar	Tunisia
Bangladesh	Georgia	Namibia	Turkey
Barbados	Ghana	Nepal	Uganda
Belarus	Grenada	Nicaragua	Ukraine
Belize	Guatemala	Niger	Uruguay
Benin	Guinea	Nigeria	Uzbekistan
Bhutan	Guinea-Bis.	Pakistan	Vanuatu
Bolivia	Guyana	Panama	Venezuela
Bosnia	Honduras	Paraguay	Vietnam
Botswana	Hungary	Peru	West Bank
Brazil	India	Philippines	Yemen, R.
Bulgaria	Indonesia	Poland	Zambia
Burkina Faso	Israel	Romania	Zimbabwe
Burundi	Jamaica	Russia	
Cambodia	Jordan	Rwanda	
Cameroon	Kazakhstan	Samoa	
Cape Verde	Kenya	Senegal	
Central African R	Kosovo	Serbia	
Chad	Kyrgyz Rep	Sierra Leone	
Chile	Lao PDR	Slovak Repub.	
China	Latvia	Slovenia	
Colombia	Lebanon	South Africa	
Congo, Dem.	Lesotho	South Asia	
Congo, Rep.	Liberia	South Sudan	
Costa Rica	Lithuania	Sri Lanka	
Cote d'Ivoire	Macedonia	St. Kitts	
Croatia	Madagascar	St. Lucia	
Czech Republic	Malawi	St. Vincent	
Djibouti	Malaysia	Sudan	
Dominica	Mali	Suriname	
Dominican Rep	Mauritania	Swaziland	

Appendix-4: Enterprise Survey Questions

Description	Survey Variable Used to Construct an Indicator	Question	Answers	Notes	Indicator Updates
Percentage of firms with bank loans or line of credit	K.8.	K.8. At this time does this establishment have a line of credit or a loan from a financial institution?	Yes/ No/ Don't know		
Estimated proportion of purchases of fixed assets that was financed from bank loans	K.5.	K.5. Over the fiscal year, please estimate the proportion of this establishment's total purchase of fixed assets that was financed from each of the following sources	Internal funds or retained earnings, Owners' contribution or issued new equity shares, borrowed from banks: private and state-owned; Borrowed from non-financial institutions; Purchases on credit from suppliers and advances from customers; Other, moneylenders, friends, relatives, bonds, etc.	All add to 100%	Survey updates on May 2, 2011
Proportion of the working capital that was financed by bank loans	K.3.	K.3. Over fiscal year, please estimate the proportion of this establishment's working capital that was financed from each of the	Internal funds or retained earnings, Borrowed from banks: private and state-owned; Borrowed from non-financial	All add to 100%	Survey updates on May 2, 2012

		following sources?	institutions which include microfinance institutions, credit cooperatives, credit unions or finance companies; Purchases on credit from suppliers and advances from customers; Other, moneylenders, friends, relatives, etc.		
Percentage of firms using banks to finance investments	K.5.	K.5. Over the fiscal year, please estimate the proportion of this establishment's total purchase of fixed assets that was financed from each of the following sources	Internal funds or retained earnings, Owners' contribution or issued new equity shares, Borrowed from banks: private and state-owned; Borrowed from non-financial institutions; Purchases on credit from suppliers and advances from customers; Other, moneylenders, friends, relatives, bonds, etc.	All add to 100%	Survey updates on May 2, 2011
Percentage of firms using loans to finance working capital	K.3.	K.3. Over fiscal year, please estimate the proportion of this establishment's working	Internal funds or retained earnings, Borrowed from banks: private and state-owned;	All add to 100%	Survey updates on May 2, 2012

		capital that was financed from each of the following sources?	Borrowed from non-financial institutions which include microfinance institutions, credit cooperatives, credit unions or finance companies; Purchases on credit from suppliers and advances from customers; Other, moneylenders, friends, relatives, etc.		
Percentage of firms identifying access/ cost of finance as a "major" or "very severe" obstacle	K.30.	K.30. Using the response options (scaled from 0 to 4, none to very severe); to what degree is Access to Finance an obstacle to the current operations of this establishment?	0-4 (none to very severe obstacle)	For BEEPS surveys conducted prior to 2008, this question used a four-point scale instead of the current five-point answer scale. "Very severe obstacle" was not an answer option.	Survey updates on May 2, 2013
Percentage of firms with a checking or savings account	K.6.	K.6. At this time, does this establishment have a checking or savings account?	Yes/ No/ Don't know		
Percentage of firms that did not apply for a loan in the last fiscal	K.16.	K.16. Referring again to the last fiscal year, did this	Yes/ No/ Don't know	The denominator is the number of firms who did and did	

year because they did not need a loan.		establishment apply for any loans or lines of credit?		not apply for a loan. The numerator is the number of firms who did not apply for a loan and also stated that they did not need a loan.	
		K.17. What was the main reason why this establishment did not apply for any line of credit or loan?	No need for a loan; Application procedures were complex; Interest rates were not favorable; Collateral requirements were too high; Size of loan and maturity were not sufficient; Did not think it would be approved; Other		Indicator created on May 1, 2012
Percentage of firms whose recent loan application was rejected.	K.16.	K.16. Referring again to the last fiscal year, did this establishment apply for only loans or lines of credit?	Yes/ No/ Don't know	The denominator is the number of firms who did and did not apply for a loan. The numerator is the number of firms who did not apply for a loan and also stated that they did not need a loan.	

		K.20. Referring only to this most recent application for a line of credit or loan, what was the outcome of that application?	Application was approved in full; Application was approved in part; Application was rejected; Application was withdrawn; Application still in progress; Don't know.		Indicator was created on April 17, 2012 and on June 26, 2017 question K.20 was revised and provided more specific options on the loan application.
--	--	---	--	--	--

Appendix-5: Countries included in FAS database

Afghanistan	Colombia	India	Mongolia	Slovenia
Albania	Comoros	Indonesia	Montenegro	Solomon Isl.
Algeria	Congo	Iran	Montserrat	South Africa
Angola	Congo, R.	Iraq	Morocco	South Sudan
Anguilla	Costa Rica	Ireland	Mozambique	Spain
Antigua and Bar	Cote d'Ivoire	Israel	Myanmar	Sri Lanka
Argentina	Croatia	Italy	Namibia	St. Kitts
Armenia	Cyprus	Jamaica	Nepal	St. Lucia
Aruba	Czech Rep	Japan	Netherlands	St. Vincent
Australia	Denmark	Jordan	New Zealand	Sudan
Austria	Djibouti	Kazakhstan	Nicaragua	Suriname
Azerbaijan	Dominica	Kenya	Niger	Swaziland
Bahamas, The	Dominican	Kiribati	Nigeria	Sweden
Bangladesh	Ecuador	Korea, Rep.	Norway	Switzerland
Barbados	Egypt	Kosovo, Rep.	Oman	Syrian Rep.
Belarus	El Salvador	Kuwait	Pakistan	Tajikistan
Belgium	Equator	Kyrgyz Republic	Palau	Tanzania
Belize	Estonia	Lao R.	Panama	Thailand
Benin	Ethiopia	Latvia	Papua New G.	Timor-Leste
Bhutan	Fiji	Lebanon	Paraguay	Togo
Bolivia	Finland	Lesotho	Peru	Tonga
Bosnia	France	Liberia	Philippines	Trinidad
Botswana	Gabon	Libya	Poland	Tunisia
Brazil	Gambia	Lithuania	Portugal	Turkey
Brunei Darussalam	Georgia	Luxembourg	Qatar	Uganda
Bulgaria	Germany	Macedonia, FYR	Romania	Ukraine
Burkina Faso	Ghana	Madagascar	Russian Fed.	UAE
Burundi	Greece	Malawi	Rwanda	United Kingdom
Cambodia	Grenada	Malaysia	Samoa	United States
Cameroon	Guatemala	Maldives	San Marino	Uruguay
Canada	Guinea	Mali	Sao Tome and P	Uzbekistan
Cabo Verde	Guinea-Bis	Malta	Saudi Arabia	Vanuatu
CAF	Guyana	Marshall Islands	Senegal	Venezuela
Chad	Haiti	Mauritania	Serbia	Vietnam
Chile	Honduras	Mauritius	Seychelles	West Bank
China, P.R.: HK	Hungary	Mexico	Sierra Leone	Yemen
China, P.R.: Macao	Iceland	Micronesia	Singapore	Zambia
China, P.R.: Main		Moldova	Slovak Republic	Zimbabwe

Appendix-6: List of FAS Indicators

Access to and Use of Financial Services

Geographical Outreach

- 1 ATMs per 1,000 km²
- 2 ATMs per 100,000 adults
- 3 Branches of all MFIs per 1,000 km²
- 4 Branches of all MFIs per 100,000 adults
- 5 Branches of commercial banks for 1000 km²
- 6 Branches of commercial banks for 100,000 adults
- 7 Branches of credit unions and financial cooperatives per 1,000 km²
- 8 Branches of credit unions and financial cooperatives per 100,000 adults
- 9 Mobile money agent outlets: active agent outlets per 1,000 km²
- 10 Mobile money agent outlets: active agent outlets per 100,000 adults
- 11 Mobile money agent outlets: registered agent outlets per 1,000 km²
- 12 Mobile money agent outlets: registered agent outlets per 100,000 adults

Use of Financial Services

Account Holders

- 13 Borrowers at all MFIs per 1,000 adults
- 14 Borrowers at commercial banks per 1,000 adults
- 15 Borrowers at commercial banks: o/w households per 1,000 adults
- 16 Borrowers at commercial banks: o/w SMEs (% of non-financial corps.)
- 17 Borrowers at credit unions and financial cooperatives per 1,000 adults
- 18 Depositors and customers with all MFIs per 1,000 adults
- 19 Depositors with commercial banks per 1,000 adults
- 20 Depositors with commercial banks: o/w households per 1,000 adults
- 21 Depositors with commercial banks: o/w SMEs (% of non-financial corps)
- 22 Depositors with credit unions and financial cooperatives per 1,000 adults

Number of Accounts

- 23 Deposit and customer accounts with all MFIs per 1,000 adults
- 24 Deposit accounts with commercial banks per 1,000 adults
- 25 Deposit accounts with commercial banks: o/w households per 1,000 adults
- 26 Deposit accounts with commercial banks: o/w SMEs (% of non-financial corps)
- 27 Deposit accounts with credit unions and financial cooperatives per 1,000 adults
- 28 Loan accounts with all MFIs per 1,000 adults
- 29 Loan accounts with commercial banks per 1,000 adults
- 30 Loan accounts with commercial banks: o/w households per 1,000 adults
- 31 Loan accounts with commercial banks: o/w SMEs (of non-financial corps)
- 32 Loan accounts with credit unions and financial cooperatives per 1,000 adults
- 33 Mobile money accounts: active per 1,000 adults
- 34 Mobile money transactions: number per 1,000 adults
- 35 Mobile money accounts: registered per 1,000 adults

Number of Accounts

- 23 Deposit and customer accounts with all MFIs per 1,000 adults
- 24 Deposit accounts with commercial banks per 1,000 adults
- 25 Deposit accounts with commercial banks: o/w households per 1,000 adults
- 26 Deposit accounts with commercial banks: o/w SMEs (% of non-financial corps)
- 27 Deposit accounts with credit unions and financial cooperatives per 1,000 adults
- 28 Loan accounts with all MFIs per 1,000 adults
- 29 Loan accounts with commercial banks per 1,000 adults
- 30 Loan accounts with commercial banks: o/w households per 1,000 adults
- 31 Loan accounts with commercial banks: o/w SMEs (of non-financial corps)
- 32 Loan accounts with credit unions and financial cooperatives per 1,000 adults
- 33 Mobile money accounts: active per 1,000 adults
- 34 Mobile money transactions: number per 1,000 adults
- 35 Mobile money accounts: registered per 1,000 adults

Appendix-7: Household-level Global Findx Index Results

Country	2011	2014	Country	2011	2014
Afghanistan	0.08107	0.04591	Denmark	0.7956	0.75874
Albania	0.19707	0.19842	Djibouti	0.08357	0.09357
Algeria	0.11408	0.20041	Dominican Rep/	0.2876	0.3351
Angola	0.27503	0.15867	Ecuador	0.24428	0.25628
Argentina	0.23197	0.30478	Egypt, Arab Rep.	0.05291	0.08672
Armenia	0.17349	0.16261	El Salvador	0.12304	0.25328
Australia	0.82486	0.80086	Estonia	0.59556	0.61475
Austria	0.68205	0.68065	Ethiopia	0.10026	0.11026
Azerbaijan	0.17309	0.21345	Finland	0.87426	0.81011
Bahrain	0.49689	0.57824	France	0.70552	0.67774
Bangladesh	0.27254	0.13456	Gabon	0.09825	0.17907
Belarus	0.36262	0.36336	Georgia	0.19983	0.24954
Belgium	0.70384	0.71512	Germany	0.72108	0.74079
Belize	0.28152	0.29152	Ghana	0.17036	0.18465
Benin	0.06664	0.09583	Greece	0.379	0.39526
Bhutan	0.1649	0.1749	Guatemala	0.20587	0.22533
Bolivia	0.25111	0.29884	Guinea	0.0307	0.03558
Bosnia	0.31244	0.28616	Haiti	0.15968	0.09511
Botswana	0.20207	0.32787	Honduras	0.14463	0.18644
Brazil	0.33804	0.42528	Hong Kong	0.66068	0.666
Bulgaria	0.28679	0.36889	Hungary	0.42231	0.38443
Burkina Faso	0.07141	0.08426	India	0.17348	0.22431
Burundi	0.03217	0.02726	Indonesia	0.16049	0.25587
Cambodia	0.13954	0.20227	Iran, Islamic Rep.	0.5886	0.57422
Cameroon	0.09254	0.05976	Iraq	0.0956	0.05717
Canada	0.85169	0.87939	Ireland	0.73313	0.69731
Central African	0.01681	0.01981	Israel	0.58028	0.77813
Chad	0.09798	0.04945	Italy	0.36402	0.54951
Chile	0.27921	0.42004	Jamaica	0.38639	0.41057
China	0.3759	0.44584	Japan	0.57784	0.73438
Colombia	0.23525	0.27695	Jordan	0.13893	0.16398
Comoros	0.13395	0.13495	Kazakhstan	0.27223	0.29922
Congo, Dem. R.	0.02255	0.0641	Kenya	0.29337	0.3783
Congo, Rep.	0.07293	0.09916	Korea, Rep.	0.69979	0.69162
Costa Rica	0.34466	0.39516	Kosovo	0.21907	0.25759
Cote d'Ivoire	0.0997	0.1097	Kuwait	0.75205	0.4872
Croatia	0.54689	0.59552	Kyrgyz Republic	0.08425	0.13038
Cyprus	0.6517	0.4474	Lao PDR	0.2503	0.2564
Czech Republic	0.52214	0.51757	Latvia	0.47054	0.5534

Country	2011	2014	Country	2011	2014
Lebanon	0.26931	0.30567	Rwanda	0.18907	0.19617
Lesotho	0.11122	0.12122	Saudi Arabia	0.28422	0.3932
Liberia	0.13144	0.13154	Senegal	0.0452	0.07219
Lithuania	0.40325	0.43301	Serbia	0.35531	0.38499
Luxembourg	0.79607	0.78541	Sierra Leone	0.12408	0.08369
Macedonia, FYR	0.35267	0.40138	Singapore	0.59409	0.65163
Madagascar	0.02526	0.0309	Slovak Republic	0.53695	0.53804
Malawi	0.13627	0.10444	Slovenia	0.6509	0.6163
Malaysia	0.39002	0.47629	Somalia	0.08412	0.09412
Mali	0.05323	0.06361	South Africa	0.3423	0.42601
Malta	0.67192	0.61046	South Asia	0.16994	0.19582
Mauritania	0.12425	0.13923	Spain	0.60049	0.7135
Mauritius	0.48699	0.50672	Sri Lanka	0.36756	0.38883
Mexico	0.19809	0.26138	Sudan	0.03726	0.08489
Moldova	0.12222	0.12701	Swaziland	0.2598	0.2698
Mongolia	0.51779	0.57871	Sweden	0.87991	0.84285
Montenegro	0.33101	0.35272	Switzerland	0.67692	0.68692
Morocco	0.19597	0.19617	Syrian Arab Rep.	0.16322	0.16422
Myanmar	0.14178	0.15178	Taiwan, China	0.56808	0.63432
Namibia	0.32475	0.33475	Tajikistan	0.03729	0.04829
Nepal	0.1562	0.17684	Tanzania	0.14317	0.1535
Netherlands	0.7622	0.69593	Thailand	0.50381	0.45826
New Zealand	0.90323	0.89189	Togo	0.05499	0.07014
Nicaragua	0.1163	0.15556	Trinidad	0.51233	0.52233
Niger	0.0106	0.02198	Tunisia	0.14654	0.15654
Nigeria	0.1807	0.25781	Turkey	0.38187	0.40341
Norway	0.90889	0.91889	Turkmenistan	0	0.01024
Oman	0.44933	0.45933	Uganda	0.17002	0.24412
Pakistan	0.03615	0.04037	Ukraine	0.26495	0.31283
Panama	0.19759	0.26844	UAE	0.43473	0.57563
Paraguay	0.19912	0.19992	United Kingdom	0.71525	0.7894
Peru	0.20038	0.21178	United States	0.76659	0.74873
Philippines	0.19797	0.20215	Uruguay	0.25915	0.40152
Poland	0.37624	0.442	Uzbekistan	0.10092	0.13939
Portugal	0.50662	0.49077	Venezuela, RB	0.2339	0.33318
Puerto Rico	0.42196	0.43196	Vietnam	0.20167	0.24322
Qatar	0.47233	0.48233	West Bank	0.10772	0.09991
Romania	0.25216	0.33212	Yemen, Rep.	0.0149	0.01378
Russia	0.27576	0.3649	Zambia	0.15545	0.17441
			Zimbabwe	0.23399	0.12395

Appendix-8: Firm-level Index Enterprise Survey Index Results

Country	2006	2009	2010	2013
Afghanistan	0.25057	0.16985	0.16812	0.13868
Albania	0.47124	0.47124	0.47124	0.47124
Algeria	0.36804	0.36804	0.36804	0.36804
Angola	0.21668	0.34633	0.34633	0.34633
Antigua and Barbuda	0.66958	0.66958	0.66958	0.66958
Argentina	0.49772	0.57993	0.56479	0.5845
Armenia	0.65607	0.60816	0.60632	0.59669
Azerbaijan	0.37622	0.41893	0.41739	0.40697
Bahamas, The	0.55494	0.55494	0.55494	0.55494
Bangladesh	0.53016	0.53016	0.53016	0.53016
Barbados	0.65426	0.65426	0.65426	0.65426
Belarus	0.56869	0.62542	0.62542	0.58387
Belize	0.58209	0.58209	0.58209	0.58209
Benin	0.44365	0.44365	0.44365	0.44365
Bhutan	0.78433	0.78433	0.78433	0.78433
Bolivia	0.63397	0.60794	0.61662	0.64291
Bosnia and Herzegovina	0.7429	0.78509	0.77959	0.78723
Botswana	0.42644	0.42644	0.62546	0.62546
Brazil	0.68544	0.68544	0.68544	0.68544
Bulgaria	0.68928	0.66489	0.66318	0.65637
Burkina Faso	0.37851	0.41481	0.41294	0.42967
Burundi	0.43834	0.42495	0.42298	0.87989
Cambodia	0.27418	0.27418	0.27418	0.27418
Cameroon	0.52149	0.50311	0.50128	0.52376
Cape Verde	0.516	0.62604	0.62421	0.6578
Central African Republic	0.60278	0.60278	0.60278	0.60278
Chad	0.36255	0.36255	0.36255	0.36255
Chile	0.74046	0.74046	0.82019	0.82019
China	0.5214	0.5214	0.5214	0.5214
Colombia	0.70806	0.67328	0.64847	0.6815
Congo, Dem. Rep.	0.13061	0.14731	0.18806	0.21475
Congo, Rep.	0.31519	0.31519	0.31519	0.31519
Costa Rica	0.5611	0.5611	0.5611	0.5611
Cote d'Ivoire	0.2185	0.2185	0.2185	0.2185
Croatia	0.96172	0.96172	0.67294	0.67294
Czech Republic	0.59802	0.61106	0.60967	0.73587
Djibouti	0.56233	0.56233	0.56233	0.56233
Dominica	0.53112	0.53112	0.53112	0.53112
Dominican Republic	0.77478	0.77478	0.77478	0.77478

Country	2006	2009	2010	2013
Mauritius	0.59355	0.59355	0.59355	0.59355
Mexico	0.29407	0.34033	0.41647	0.40918
Micronesia, Fed.	0.50545	0.50545	0.50545	0.50545
Moldova	0.59224	0.53584	0.53421	0.5645
Mongolia	0.63152	0.63152	0.63152	0.63152
Montenegro	0.73556	0.73556	0.73556	0.73556
Morocco	0.49026	0.55001	0.54801	0.70887
Mozambique	0.20599	0.20599	0.20599	0.20599
Myanmar	0.17084	0.17084	0.17084	0.17084
Namibia	0.485	0.485	0.485	0.59458
Nepal	0.56632	0.55002	0.54822	0.41608
Nicaragua	0.52557	0.48287	0.48847	0.48402
Niger	0.46205	0.40353	0.40128	0.41745
Nigeria	0.34161	0.34161	0.34161	0.34161
Pakistan	0.32503	0.29824	0.29675	0.28634
Panama	0.68719	0.38972	0.38972	0.38972
Paraguay	0.50607	0.62182	0.68393	0.71378
Peru	0.79963	0.77515	0.77368	0.80471
Philippines	0.54582	0.54582	0.54582	0.54582
Poland	0.60195	0.65182	0.65053	0.60246
Romania	0.527	0.48077	0.47927	0.48639
Russian Federation	0.52635	0.51563	0.48879	N.A.
Rwanda	0.49615	0.45641	0.45444	0.54077
Samoa	0.798	0.798	0.798	0.798
Senegal	0.29202	0.29202	0.43876	0.43876
Serbia	0.66585	0.68965	0.68845	0.6583
Sierra Leone	0.34949	0.34949	0.34949	0.34949
Slovak Republic	0.46086	0.45572	0.4541	0.70563
Slovenia	0.81779	0.79152	0.77564	0.71345
South Africa	0.60614	0.60614	0.60614	0.60614
South Sudan	0.28625	0.28625	0.28625	0.28625
Sri Lanka	0.84983	0.84983	0.84983	0.84983
St. Kitts and Nevis	0.68396	0.68396	0.68396	0.68396
St. Lucia	0.57685	0.57685	0.57685	0.57685
St. Vincent	0.75076	0.75076	0.75076	0.75076
Sub-Saharan Africa	0.37481	0.40733	0.3767	0.40591
Sudan	0.39544	0.39544	0.39544	0.39544
Suriname	0.66838	0.66838	0.66838	0.66838
Swaziland	0.42858	0.42858	0.42858	0.42858
Syrian Arab Republic	0.47638	0.47638	0.47638	0.47638

Country	2006	2009	2010	2013
Tajikistan	17.6868	0.54352	0.54208	0.38809
Tanzania	0.36422	0.35398	0.35207	0.32631
Thailand	0.92938	0.92938	0.92938	0.92938
Timor-Leste	0.33006	0.33006	0.33006	0.33006
Togo	0.36482	0.36482	0.36482	0.36482
Tonga	0.58865	0.58865	0.58865	0.58865
Trinidad and Tobago	0.72838	0.72838	0.72838	0.72838
Tunisia	0.67195	0.67195	0.67195	0.67195
Turkey	0.59511	0.71943	0.71837	0.67412
Uganda	0.33913	0.32884	0.327	0.41175
Ukraine	0.54491	0.51717	0.51573	0.49703
Uruguay	0.48612	0.5104	0.55932	0.57183
Uzbekistan	0.4434	0.39626	0.3945	0.52004
Vanuatu	0.62545	0.62545	0.62545	0.62545
Venezuela, RB	0.55464	0.62298	0.61757	0.61757
Vietnam	0.64417	0.64417	0.64417	0.64417
West Bank and Gaza	0.3682	0.35695	0.35505	0.22742
Yemen, Rep.	0.17185	0.17185	0.17185	0.13516
Zambia	0.42587	0.35463	0.35463	0.35463
Zimbabwe	0.34757	0.34757	0.34757	0.34757

Appendix-9: Financial Access Index Results

Country	2004	2005	2006	2007
Afghanistan	0.00105	0.00159	0.00282	0.004
Albania	0.05503	0.08156	0.10627	0.14211
Algeria	0.02189	0.02145	0.02484	0.02955
Angola	0.01183	0.01583	0.02773	0.03534
Antigua and Barbuda	N.A.	N.A.	N.A.	N.A.
Argentina	0.14103	0.14201	0.14985	0.15746
Armenia	0.05425	0.06496	0.07872	0.11089
Aruba	N.A.	N.A.	N.A.	N.A.
Australia	0.67246	0.70779	0.71784	0.71506
Austria	0.55006	0.50578	0.50315	0.4843
Azerbaijan	N.A.	N.A.	0.09631	0.10924
Bahamas, The	N.A.	N.A.	N.A.	0.39372
Bangladesh	0.24322	0.24478	0.23919	0.24846
Barbados	N.A.	N.A.	0.22227	0.22156
Belarus	0.06846	0.08505	0.09736	0.11853
Belgium	0.62031	0.59279	0.57285	0.55989
Belize	0.21819	0.21765	0.2137	0.22454
Benin	N.A.	N.A.	N.A.	N.A.
Bhutan	0.05528	0.04954	0.04547	0.04995
Bolivia	N.A.	N.A.	N.A.	0.07168
Bosnia and Herzegovina	N.A.	N.A.	0.16197	0.19087
Botswana	0.08546	0.0877	0.10012	0.15265
Brazil	N.A.	N.A.	N.A.	0.57604
Brunei Darussalam	0.22917	0.27763	0.27453	0.3122
Bulgaria	0.43367	0.45039	0.51548	0.57279
Burkina Faso	N.A.	N.A.	N.A.	N.A.
Burundi	0.00568	0.00509	0.00513	0.00629
Cambodia	N.A.	N.A.	0.00988	0.01409
Cameroon	0.00311	0.00556	0.00594	0.00653
Canada	N.A.	N.A.	0.9392	0.92828
Cape Verde	0.11349	0.11934	0.14313	0.18028
Central African Republic	0.00068	0.0002	0	0.00043
Chad	0.00097	0.00078	0.00053	0.00037
Chile	0.18565	0.21034	0.22549	0.24339
China	N.A.	N.A.	N.A.	N.A.
Colombia	N.A.	N.A.	N.A.	0.13773
Comoros	0.00446	0.00383	0.00346	0.00509
Congo, Dem. Rep.	N.A.	N.A.	N.A.	N.A.
Congo, Rep.	0.00424	0.00379	0.0038	0.00643

Country	2004	2005	2006	2007
Costa Rica	0.16983	0.18382	0.19368	0.2128
Cote d'Ivoire	N.A.	N.A.	N.A.	N.A.
Croatia	N.A.	0.37529	0.40473	0.43556
Cyprus	0.51195	0.4885	0.49834	0.47889
Czech Republic	0.21869	0.2276	0.23644	0.22978
Denmark	0.48334	0.47814	0.47478	0.46665
Djibouti	0.011	0.00987	0.0113	0.01051
Dominica	0.16916	0.17158	0.16656	0.14674
Dominican Republic	0.11954	0.13846	0.13711	0.13909
Ecuador	0.06068	0.07271	0.08158	0.13829
Egypt, Arab Rep.	0.02591	0.02789	0.0322	0.03631
El Salvador	N.A.	N.A.	N.A.	N.A.
Equatorial Guinea	0.01144	0.01094	0.01173	0.01596
Estonia	0.35409	0.38271	0.41135	0.43227
Ethiopia	0.0028	0.00251	0.00236	0.00261
Fiji	0.11468	0.11565	0.12295	0.12682
Finland	0.51353	0.50223	0.21561	0.20378
France	0.45515	0.48424	0.55645	0.56624
Gabon	0.03648	0.03653	0.03739	0.03853
Gambia, The	N.A.	N.A.	N.A.	N.A.
Georgia	0.04297	0.0582	0.09162	0.14466
Germany	N.A.	N.A.	N.A.	0.50919
Ghana	N.A.	N.A.	N.A.	N.A.
Greece	N.A.	0.4062	0.42513	0.44056
Grenada	0.31152	0.30032	0.29385	0.29832
Guatemala	N.A.	N.A.	N.A.	N.A.
Guinea	0.00252	0.00254	0.00266	0.00285
Guinea-Bissau	N.A.	N.A.	N.A.	N.A.
Guyana	0.0739	0.07496	0.07491	0.07542
Haiti	N.A.	N.A.	N.A.	N.A.
Honduras	0.0807	0.08672	0.09871	0.12134
Hungary	0.22325	0.2358	0.24912	0.26688
Iceland	0.77935	0.76685	0.69965	0.66651
India	N.A.	0.06024	0.05935	0.06041
Indonesia	0.05667	0.05901	0.0644	0.0672
Iran, Islamic Rep.	N.A.	0.1162	0.12732	0.14657
Iraq	N.A.	N.A.	N.A.	N.A.
Ireland	0.5238	0.50533	0.49731	0.4902

Country	2004	2005	2006	2007
Israel	0.38703	0.33501	0.4089	0.41168
Italy	0.58197	0.57679	0.58589	0.60337
Jamaica	0.11124	0.11688	0.12437	0.12033
Japan	0.70994	0.70019	0.68274	0.65727
Jordan	N.A.	N.A.	N.A.	0.15156
Kazakhstan	0.05521	0.07526	0.09085	0.15897
Kenya	0.01659	0.01514	0.02049	0.02949
Kiribati	N.A.	N.A.	N.A.	N.A.
Korea, Rep.	0.93543	0.95273	0.96896	1
Kosovo	0	0.12798	0.12717	0.13586
Kuwait	0.17751	0.19735	0.21835	0.24136
Kyrgyz Republic	0.02139	0.02202	0.02206	0.0298
Lao PDR	0.00602	0.00607	0.00694	0.01132
Latvia	0.31092	0.30694	0.3224	0.36843
Lebanon	0.2725	0.26965	0.26447	0.26115
Lesotho	0.02159	0.02409	0.02233	0.02601
Liberia	N.A.	N.A.	N.A.	N.A.
Libya	0.04882	0.0465	0.05103	0.04992
Lithuania	0.24347	0.25315	0.27112	0.29887
Luxembourg	0.90486	0.86276	0.81611	0.78311
Macedonia, FYR	N.A.	0.09743	0.13686	0.19139
Madagascar	0.00491	0.00555	0.00598	0.00704
Malawi	0.00658	0.00887	0.00823	0.01151
Malaysia	0.16625	0.15959	0.15672	0.19255
Maldives	0.09294	0.09236	0.09744	0.15036
Mali	N.A.	N.A.	N.A.	N.A.
Malta	0.46037	0.45277	0.40586	0.42268
Marshall Islands	N.A.	N.A.	N.A.	0.06564
Mauritania	N.A.	N.A.	N.A.	N.A.
Mauritius	0.22612	0.23626	0.23492	0.24402
Mexico	0.15673	0.16665	0.17773	0.19178
Micronesia, Fed. St.	0.06064	0.05758	0.05532	0.05401
Moldova	0.06119	0.07349	0.08203	0.09358
Mongolia	N.A.	N.A.	N.A.	N.A.
Montenegro	N.A.	0.14904	0.20096	0.27705
Morocco	0.07327	0.10144	0.09352	0.10044
Mozambique	0.01384	0.01516	0.01904	0.02084
Myanmar	0.00598	0.00494	0.00355	0.00334
Namibia	N.A.	N.A.	0.07725	0.07862

Country	2004	2005	2006	2007
Nepal	N.A.	N.A.	N.A.	N.A.
Netherlands	0.42458	0.37744	0.38639	0.38691
New Caledonia	N.A.	N.A.	N.A.	N.A.
New Zealand	0.3778	0.38479	0.40741	0.39462
Nicaragua	0.03249	0.04144	0.04766	0.05202
Niger	N.A.	N.A.	N.A.	N.A.
Nigeria	NA	0.01722	0.01964	0.03473
Norway	0.29637	0.28867	0.28897	0.27909
Oman	N.A.	N.A.	N.A.	N.A.
Pakistan	0.0321	0.03232	0.0347	0.03825
Palau	N.A.	N.A.	N.A.	N.A.
Panama	N.A.	N.A.	N.A.	0.20129
Papua New Guinea	0.00682	0.00593	0.02095	0.02176
Paraguay	N.A.	N.A.	N.A.	N.A.
Peru	0.06029	0.0627	0.10029	0.12659
Philippines	0.0784	0.08064	0.08179	0.07901
Poland	0.21527	0.21875	0.23138	0.25183
Portugal	0.87131	0.9158	0.94137	0.93487
Qatar	0.32599	0.32572	0.30739	0.28426
Romania	N.A.	N.A.	N.A.	N.A.
Russian Federation	0.16712	0.1948	0.23604	0.29086
Rwanda	0.0013	0.00635	0.00561	0.00501
Samoa	0.11746	0.1155	0.12013	0.14659
Sao Tome and Principe	0.01683	0.02316	0.02157	0.02425
Saudi Arabia	0.14008	0.14472	0.17496	0.19825
Senegal	N.A.	N.A.	N.A.	N.A.
Serbia	N.A.	0.17341	0.21899	0.27654
Seychelles	0.31338	0.29424	0.29688	0.2914
Sierra Leone	N.A.	N.A.	N.A.	N.A.
Singapore	0.61977	0.62951	0.58784	0.54699
Slovak Republic	0.26137	0.27163	0.27951	0.28365
Slovenia	0.50597	0.51831	0.51179	0.52253
Solomon Islands	0.03791	0.0373	0.04777	0.05081
Somalia	N.A.	N.A.	N.A.	N.A.
South Africa	0.14147	0.12923	0.13391	0.14022
South Sudan	N.A.	N.A.	N.A.	N.A.
Spain	1	1	1	0.99962
Sri Lanka	0	0	0	0.08564

Country	2004	2005	2006	2007
St. Kitts and Nevis	N.A.	N.A.	N.A.	0.43328
St. Lucia	0.23446	0.22416	0.22017	0.22144
St. Vincent	N.A.	N.A.	N.A.	N.A.
Sudan	0.00886	0.00749	0.0087	0.01058
Suriname	0.10978	0.11762	0.13576	0.14713
Swaziland	0.0512	0.06967	0.07852	0.07858
Sweden	0.24184	0.24146	0.23547	0.24033
Switzerland	0.60996	0.60412	0.59372	0.58095
Syrian Arab Republic	0.00924	0.0088	0.00848	0.00867
Taiwan, China	N.A.	N.A.	N.A.	N.A.
Tajikistan	0.02121	0.01992	0.02176	0.02387
Tanzania	0.00531	0.00578	0.00591	0.01134
Thailand	0.11628	0.15745	0.20536	0.22777
Timor-Leste	N.A.	N.A.	N.A.	N.A.
Togo	N.A.	N.A.	N.A.	N.A.
Tonga	0.18972	0.17139	0.15202	0.15176
Trinidad and Tobago	N.A.	N.A.	N.A.	N.A.
Tunisia	0.08088	0.08455	0.0899	0.10237
Turkey	0.17361	0.17655	0.18877	0.20266
Uganda	0.00838	0.0098	0.01053	0.01176
Ukraine	0.09945	0.13344	0.1673	0.22408
United Arab Emirates	0.15375	0.25412	0.22441	0.21452
United Kingdom	N.A.	0.62902	0.62297	0.61789
United States	0.81561	0.82838	0.80822	0.80929
Uruguay	0.16416	N.A.	N.A.	N.A.
Uzbekistan	0.1535	0.14789	0.14962	0.15429
Vanuatu	0.09328	0.09268	0.08935	0.1101
Venezuela, RB	N.A.	0.14713	0.15461	0.15902
Vietnam	N.A.	N.A.	N.A.	N.A.
West Bank and Gaza	N.A.	N.A.	0.07019	0.07964
Yemen, Rep.	0.00843	0.01031	0.01159	0.01356
Zambia	0.01495	0.01545	0.01811	0.02148
Zimbabwe	N.A.	N.A.	0.03983	0.04191

Country	2008	2009	2010	2011
Afghanistan	0.00478	0.00792	0.00827	0.00821
Albania	0.19268	0.20907	0.20491	0.20663
Algeria	0.0311	0.03473	0.03475	0.03532
Angola	0.04616	0.05774	0.07287	0.08536
Antigua and Barbuda	N.A.	0.41425	0.40576	0.39504
Argentina	0.17064	0.18295	0.19112	0.204
Armenia	0.14688	0.17349	0.18115	0.21351
Aruba	N.A.	N.A.	N.A.	0.47459
Australia	0.6813	0.68785	0.66981	0.65835
Austria	0.4733	0.46977	0.44026	0.43532
Azerbaijan	0.1187	0.12664	0.12874	0.13502
Bahamas, The	0.38386	0.37604	0.35422	0.37821
Bangladesh	0.24517	0.24954	0.25568	0.26437
Barbados	0.23244	0.22637	0.21418	0.19906
Belarus	0.13083	0.13788	0.14326	0.14255
Belgium	0.54063	0.52501	0.50546	0.49302
Belize	0.22867	0.22887	0.22283	0.22224
Benin	N.A.	N.A.	0.01787	0.01957
Bhutan	0.0534	0.05707	0.07576	0.10227
Bolivia	0.07531	0.08561	0.09766	0.11224
Bosnia and Herzegovina	0.22541	0.27156	0.22815	0.23862
Botswana	0.14091	0.13503	0.13543	0.12218
Brazil	0.57951	0.58453	0.57166	0.55174
Brunei Darussalam	0.35189	0.38732	0.36172	0.34417
Bulgaria	0.62557	0.64997	0.63621	0.5291
Burkina Faso	N.A.	N.A.	0.00965	0.01309
Burundi	0.00611	0.00744	0.00865	0.01017
Cambodia	0.02298	0.0278	0.02996	0.0343
Cameroon	0.0075	0.00839	0.0102	0.01153
Canada	0.92256	0.89882	0.84911	0.77284
Cape Verde	0.21963	0.23939	0.25853	0.26062
Central African Republic	0.00062	0.00207	0.00312	0.00388
Chad	0.00115	0.00155	0.00159	0.00185
Chile	0.2612	0.27369	0.27372	0.2735
China	N.A.	N.A.	N.A.	N.A.
Colombia	0.20227	0.21257	0.26625	0.36621
Comoros	0.00651	0.00918	0.00996	0.02818
Congo, Dem. Rep.	0	0.00039	0.00148	0.00168
Congo, Rep.	0.00883	0.00986	0.01244	0.0156

Country	2008	2009	2010	2011
Costa Rica	0.21537	0.22434	0.21954	0.25181
Cote d'Ivoire	N.A.	N.A.	0.02701	0.02981
Croatia	0.46531	0.48901	0.48062	0.49477
Cyprus	0.48221	0.48996	0.47127	0.45066
Czech Republic	0.22894	0.23198	0.22728	0.2322
Denmark	0.44473	0.40972	0.36824	0.34738
Djibouti	0.01304	0.01876	0.02309	0.02647
Dominica	0.15793	0.21144	0.24623	0.23312
Dominican Republic	0.13728	0.13893	0.13478	0.13717
Ecuador	0.16088	0.19574	0.23807	0.28522
Egypt, Arab Rep.	0.04039	0.04526	0.04653	0.04762
El Salvador	N.A.	0.15507	0.14324	0.1432
Equatorial Guinea	0.02459	0.02438	0.02738	0.03939
Estonia	0.42712	0.4055	0.37931	0.35338
Ethiopia	0.00274	0.00324	0.0037	0.00578
Fiji	0.13787	0.13997	0.15315	0.15799
Finland	0.19694	0.18971	0.18055	0.17342
France	0.55658	0.54881	0.5272	0.52142
Gabon	0.03803	0.04319	0.04847	0.05474
Gambia, The	N.A.	N.A.	N.A.	N.A.
Georgia	0.20795	0.20238	0.20442	0.21076
Germany	0.5015	0.49871	0.48327	0.4665
Ghana	0.02965	0.03069	0.03049	0.03111
Greece	0.45256	0.4458	0.41803	0.39121
Grenada	0.30412	0.30799	0.30707	0.30014
Guatemala	0.1913	0.20652	0.21153	0.22268
Guinea	0.00354	0.00438	0.00488	0.00619
Guinea-Bissau	N.A.	N.A.	0.00922	0.01036
Guyana	0.07462	0.07549	0.07516	0.07524
Haiti	N.A.	N.A.	N.A.	N.A.
Honduras	0.13638	0.14229	0.13075	0.15062
Hungary	0.27667	0.27658	0.26185	0.25501
Iceland	0.61568	0.51276	0.47961	0.43626
India	0.06382	0.06858	0.07557	0.08266
Indonesia	0.07407	0.08076	0.0744	0.08729
Iran, Islamic Rep.	0.16388	0.1817	0.19326	0.22271
Iraq	0.0121	0.0184	0.02267	0.02253
Ireland	0.49072	0.48205	0.4217	0.39719

Country	2008	2009	2010	2011
Israel	0.42199	0.46721	0.46355	0.4591
Italy	0.64981	0.66206	0.6054	0.60052
Jamaica	0.12273	0.12598	0.12064	0.11999
Japan	0.63421	0.65036	0.60718	0.57572
Jordan	0.15863	0.16228	0.16547	0.16807
Kazakhstan	0.21406	0.22756	0.22811	0.22699
Kenya	0.03544	0.04093	0.04562	0.04628
Kiribati	N.A.	N.A.	N.A.	0.05487
Korea, Rep.	1	1	1	1
Kosovo	0.15912	0.18638	0.199	0.20656
Kuwait	0.25277	0.25671	0.23993	0.23847
Kyrgyz Republic	0.03952	0.05353	0.04466	0.06317
Lao PDR	0.01566	0.02422	0.03661	0.04203
Latvia	0.38642	0.39118	0.38217	0.34377
Lebanon	0.25925	0.26043	0.25383	0.25338
Lesotho	0.02867	0.03171	0.03574	0.03723
Liberia	0.00837	0.01399	0.01541	0.01588
Libya	0.0492	0.04989	0.04952	0.05078
Lithuania	0.31298	0.32072	0.3122	N.A.
Luxembourg	0.76172	0.73988	0.69937	0.6836
Macedonia, FYR	0.25353	0.26822	0.26333	0.25276
Madagascar	0.00776	0.00831	0.00799	0.00862
Malawi	0.01267	0.01615	0.0184	0.01438
Malaysia	0.19701	0.23307	0.22468	0.21686
Maldives	0.14493	0.14648	0.13875	0.13801
Mali	N.A.	N.A.	0.02122	0.02535
Malta	0.4173	0.41722	0.41354	0.42719
Marshall Islands	0.07558	0.07539	0.0743	0.0984
Mauritania	N.A.	N.A.	N.A.	0.02583
Mauritius	0.23408	0.24214	0.23699	0.24168
Mexico	0.19944	0.20441	0.20279	0.19525
Micronesia, Fed. St.	0.05326	0.06382	0.08443	0.08477
Moldova	0.11243	0.12355	0.1264	0.13556
Mongolia	0.22675	0.23677	0.24724	0.33696
Montenegro	0.34643	0.37606	0.36251	0.36483
Morocco	0.11152	0.13703	0.14167	0.15128
Mozambique	0.02275	0.02548	0.02894	0.03165
Myanmar	0.00305	0.00308	0.00281	0.00342
Namibia	0.15329	0.19592	0.21105	0.20747

Country	2008	2009	2010	2011
Nepal	N.A.	N.A.	N.A.	0.05034
Netherlands	0.37079	0.34842	0.30461	0.28385
New Caledonia	N.A.	N.A.	N.A.	N.A.
New Zealand	0.39329	0.39366	0.36978	0.3724
Nicaragua	0.05732	0.05817	0.05157	0.05614
Niger	N.A.	N.A.	0.00332	0.00489
Nigeria	0.0536	0.06446	0.06064	0.06116
Norway	0.26631	0.25354	0.23012	0.21714
Oman	N.A.	N.A.	N.A.	N.A.
Pakistan	0.04135	0.04354	0.04382	0.04652
Palau	N.A.	N.A.	N.A.	N.A.
Panama	0.2077	0.2189	0.21482	0.22774
Papua New Guinea	0.02319	0.02384	0.02413	0.02825
Paraguay	N.A.	0.06937	0.09086	0.092
Peru	0.16993	0.19935	0.24627	0.30025
Philippines	0.07979	0.08207	0.08264	0.08692
Poland	0.28488	0.30367	0.29626	0.3027
Portugal	0.9586	0.96838	0.92886	0.88144
Qatar	0.25078	0.25355	0.25183	0.22283
Romania	0.3315	0.33732	0.32941	0.34155
Russian Federation	0.35566	0.38941	0.45406	0.51777
Rwanda	0.01833	0.02288	0.02979	0.03564
Samoa	0.14952	0.16886	0.17405	0.15529
Sao Tome and Principe	0.03048	0.03086	0.07393	0.139
Saudi Arabia	0.2172	0.23165	0.23035	0.2301
Senegal	N.A.	N.A.	0.02607	0.02915
Serbia	0.31532	0.32188	0.31012	0.30189
Seychelles	0.32813	0.33401	0.32335	0.3301
Sierra Leone	0.00708	0.00911	0.00913	0.00972
Singapore	0.49066	0.48107	0.49621	0.46886
Slovak Republic	0.28912	0.28231	0.27263	0.2698
Slovenia	0.52483	0.52639	0.50106	0.4899
Solomon Islands	0.05379	0.05456	0.06572	0.06093
Somalia	N.A.	N.A.	N.A.	N.A.
South Africa	0.19224	0.22481	0.22917	0.22716
South Sudan	N.A.	N.A.	N.A.	N.A.
Spain	0.97268	0.92769	0.86833	0.81956
Sri Lanka	0.09373	0.10094	0.10383	0.11462

Country	2008	2009	2010	2011
St. Kitts and Nevis	0.45633	0.47479	0.44301	0.43058
St. Lucia	0.21069	0.19755	0.24043	0.23828
St. Vincent	N.A.	0.16921	0.17078	0.16793
Sudan	0.01177	0.01371	0.01898	0.01973
Suriname	0.14239	0.16401	0.16098	0.15943
Swaziland	0.08923	0.08761	0.09205	0.09297
Sweden	0.24215	0.23842	0.22567	0.22621
Switzerland	0.56519	0.55606	0.5319	0.52478
Syrian Arab Republic	0.01792	0.03683	0.03683	0.03672
Taiwan, China	N.A.	N.A.	N.A.	N.A.
Tajikistan	0.02689	0.02982	0.03254	0.04071
Tanzania	0.0139	0.0171	0.01838	0.0202
Thailand	0.29451	0.32208	0.33403	0.3374
Timor-Leste	0.01392	0.01346	0.01409	0.02308
Togo	N.A.	N.A.	0.02419	0.02613
Tonga	0.19574	0.18664	0.17208	0.16923
Trinidad and Tobago	0.17101	0.17715	0.1732	0.16621
Tunisia	0.10835	0.11828	0.12843	0.13219
Turkey	0.22507	0.23432	0.24577	0.26159
Uganda	0.01506	0.01858	0.0186	0.0187
Ukraine	0.28557	0.28831	0.27769	0.28424
United Arab Emirates	0.20845	0.24854	0.22394	0.22352
United Kingdom	0.59428	0.56361	0.53145	0.51118
United States	0.76535	0.77757	N.A.	N.A.
Uruguay	N.A.	0.15831	0.16377	0.17771
Uzbekistan	0.16079	0.16575	0.1715	0.17878
Vanuatu	0.14208	0.15563	0.16658	0.16663
Venezuela, RB	0.16271	0.16046	0.18861	0.19331
Vietnam	0.05815	0.06847	0.07221	0.07891
West Bank and Gaza	0.08691	0.09786	0.09517	0.09881
Yemen, Rep.	0.01457	0.01596	0.01634	0.01652
Zambia	0.02812	0.03552	0.03623	0.03672
Zimbabwe	0.03773	0.04267	0.03216	0.03302

Country	2012	2013	2014	2015
Afghanistan	0.00754	0.00731	0.00568	0.00777
Albania	0.20394	0.20093	0.20195	0.18297
Algeria	0.03479	0.03496	0.03853	0.04059
Angola	0.09603	0.10787	0.12302	0.10427
Antigua and Barbuda	0.39021	0.40382	0.40978	0.34846
Argentina	0.21072	0.2278	0.26131	0.2303
Armenia	0.23519	0.24765	0.28951	0.25408
Aruba	0.49481	0.49517	0.52293	0.45402
Australia	0.64236	0.62508	0.693	0.62004
Austria	0.4338	0.43686	0.49506	0.41588
Azerbaijan	0.13479	0.14166	0.16343	0.14563
Bahamas, The	0.36399	0.4584	0.52067	0.44744
Bangladesh	0.2766	0.27741	0.25899	0.80571
Barbados	0.2101	0.2046	0.24182	0.18204
Belarus	0.15298	0.16702	N.A.	0.17275
Belgium	0.48044	0.47504	0.49992	0.43759
Belize	0.21221	0.22253	0.23369	0.22276
Benin	0.02103	0.02316	0.023	0.02206
Bhutan	0.06668	0.11818	0.12894	0.13248
Bolivia	0.12189	0.13928	0.17409	0.16792
Bosnia and Herzegovina	0.2388	0.24797	0.26529	0.23555
Botswana	0.11822	0.12322	0.13916	0.11868
Brazil	0.54105	0.58283	0.63541	0.43577
Brunei Darussalam	0.3722	0.34118	0.36064	0.30787
Bulgaria	0.52105	0.52339	0.53838	0.57117
Burkina Faso	0.01287	0.01371	N.A.	0.01716
Burundi	0.01127	0.014	0.01182	0.02438
Cambodia	0.03798	0.04216	0.05557	0.18418
Cameroon	0.01199	0.01322	0.01416	1.9E-05
Canada	0.74082	0.7983	0.90658	0.80286
Cape Verde	0.27685	0.27573	0.29011	0.25918
Central African Republic	0.00335	0.00304	N.A.	N.A.
Chad	0.00104	0.00026	0.00116	0.00406
Chile	0.27614	0.2638	0.26232	0.22921
China	0.14981	0.17898	0.23055	0.27976
Colombia	0.51585	0.65073	1	1
Comoros	0.02327	0.02394	0.02483	0.02278
Congo, Dem. Rep.	0.00207	0.00101	0.00149	0.00609
Congo, Rep.	0.01688	0.02116	N.A.	0.03597

Country	2012	2013	2014	2015
Costa Rica	0.2516	0.30565	0.35845	0.28666
Cote d'Ivoire	0.02926	0.03247	N.A.	0.03502
Croatia	0.49257	0.49376	0.54804	0.49466
Cyprus	0.40836	0.32294	0.32827	0.37806
Czech Republic	0.23564	0.24858	0.26603	0.24008
Denmark	0.31587	0.29333	0.29507	0.24947
Djibouti	0.02982	0.03177	0.04054	0.04636
Dominica	0.22705	0.23751	0.24042	0.19644
Dominican Republic	0.13706	0.14645	0.16046	0.15594
Ecuador	0.4102	0.41638	N.A.	0.34058
Egypt, Arab Rep.	0.04984	0.0511	0.05824	0.05619
El Salvador	0.14202	0.15262	0.16295	N.A.
Equatorial Guinea	0.04525	0.05109	0.0545	0.05174
Estonia	0.32622	0.30493	0.32397	0.26188
Ethiopia	0.00951	N.A.	N.A.	N.A.
Fiji	0.15321	0.17025	0.20216	0.18216
Finland	0.16176	0.15841	0.16922	0.17946
France	0.50186	0.49971	0.53555	0.57054
Gabon	0.07412	0.08024	N.A.	N.A.
Gambia, The	N.A.	N.A.	N.A.	0.03158
Georgia	0.25056	0.27064	0.3032	0.32493
Germany	0.44767	0.44769	0.44801	0.49046
Ghana	0.03586	0.04433	0.04593	0.05395
Greece	0.36988	0.31695	0.31165	0.27687
Grenada	0.28392	0.29095	0.29882	0.27567
Guatemala	0.22269	0.24411	0.25387	0.2251
Guinea	0.00678	0.0071	0.00704	0.02455
Guinea-Bissau	0.01218	0.01804	0.01703	0.00557
Guyana	0.08659	0.08785	0.09435	0.07729
Haiti	N.A.	N.A.	N.A.	N.A.
Honduras	0.15688	0.1626	0.16484	0.14899
Hungary	0.24386	0.24295	0.26844	0.28874
Iceland	0.40346	0.38629	0.39539	0.33445
India	0.0908	0.09916	0.12093	0.19748
Indonesia	0.15288	0.17437	0.22004	0.22615
Iran, Islamic Rep.	0.24182	0.26216	0.29815	0.31092
Iraq	0.02361	0.0206	N.A.	0.01966
Ireland	0.36661	0.36092	0.38821	0.42563

Country	2012	2013	2014	2015
Israel	0.46402	0.47742	0.54484	0.39339
Italy	0.57532	0.54248	0.55225	0.5099
Jamaica	0.11849	0.11847	0.13837	0.13748
Japan	0.5591	0.55852	0.60576	0.53036
Jordan	0.16746	0.1712	0.18316	0.15095
Kazakhstan	0.23264	0.23702	0.27546	0.22867
Kenya	0.04747	0.04749	0.05219	0.04886
Kiribati	0.05207	0.0639	N.A.	N.A.
Korea, Rep.	1	1	1	1
Kosovo	0.20609	0.2044	0.20867	0.19619
Kuwait	0.24806	0.22654	0.22301	0.22782
Kyrgyz Republic	0.07529	0.09099	0.11291	0.1194
Lao PDR	0.04755	0.06216	0.6213	0.07928
Latvia	0.32261	0.29736	0.29976	0.25414
Lebanon	0.25465	0.26018	0.27601	0.21635
Lesotho	0.03936	0.04464	0.04868	0.03888
Liberia	0.01473	0.01528	0.01355	N.A.
Libya	0.05158	N.A.	N.A.	N.A.
Lithuania	N.A.	N.A.	N.A.	0.17599
Luxembourg	0.64381	0.63554	0.67985	0.61476
Macedonia, FYR	0.24394	0.25835	0.28191	0.2723
Madagascar	0.00882	0.00828	0.00863	0.02597
Malawi	0.02318	0.02326	0.02377	0.02733
Malaysia	0.20991	0.21245	0.22592	0.19371
Maldives	0.14946	0.15301	0.1775	0.14627
Mali	0.02713	0.0294	0.02956	0.03009
Malta	0.41639	0.40867	0.40032	0.38368
Marshall Islands	0.09665	0.0966	0.08044	0.09002
Mauritania	0.02825	0.04027	0.0461	0.05059
Mauritius	0.24029	0.24225	0.26261	0.23965
Mexico	0.20603	0.20498	0.22847	0.21047
Micronesia, Fed. Sts.	0.10205	0.10046	0.10011	0.1034
Moldova	0.14099	0.15141	0.17355	0.13366
Mongolia	0.38452	0.41431	0.45067	0.50087
Montenegro	0.36921	0.38322	0.39997	0.38147
Morocco	0.15748	0.16521	0.17411	0.16296
Mozambique	0.03325	0.03483	0.04223	0.05961
Myanmar	0.00385	0.00743	0.01098	0.01918
Namibia	0.19542	0.20596	0.23777	0.21044

Country	2012	2013	2014	2015
Nepal	0.05401	0.05555	0.05811	0.07783
Netherlands	0.26315	0.24659	0.24554	0.21003
New Caledonia	N.A.	N.A.	N.A.	N.A.
New Zealand	0.35739	0.34184	0.35746	0.3115
Nicaragua	0.06041	0.07034	0.06259	0.0596
Niger	0.00513	0.00581	N.A.	0.00679
Nigeria	0.05587	0.06124	0.0741	0.06485
Norway	0.20364	0.19401	0.20505	0.16569
Oman	N.A.	N.A.	N.A.	0.04562
Pakistan	0.04829	0.05233	0.0554	0.06874
Palau	N.A.	N.A.	N.A.	N.A.
Panama	0.23981	0.2616	0.29892	0.28426
Papua New Guinea	0.03048	0.02923	0.02936	0.03678
Paraguay	0.09598	0.10624	0.11644	0.11714
Peru	0.37513	0.44221	0.59964	0.43132
Philippines	0.09262	0.10313	0.11595	0.11009
Poland	0.3098	0.3139	0.35001	0.3896
Portugal	0.83133	0.80645	0.849	0.77065
Qatar	0.2431	0.24652	0.27728	0.25561
Romania	0.32765	0.31938	0.34179	0.31263
Russian Federation	0.59256	0.64036	0.80871	0.64642
Rwanda	0.04121	0.04272	0.03676	0.10651
Samoa	0.15617	0.19465	0.23197	0.19907
Sao Tome and Principe	0.15209	0.14865	0.15782	0.18939
Saudi Arabia	0.23482	0.24712	0.30246	0.26543
Senegal	0.02996	0.02862	0.02945	0.02952
Serbia	0.2859	0.26569	0.26237	0.24141
Seychelles	0.34539	0.39817	0.43515	0.41851
Sierra Leone	0.00923	N.A.	N.A.	N.A.
Singapore	0.44048	0.40881	0.41454	0.37641
Slovak Republic	0.27336	0.27964	0.31165	0.28149
Slovenia	0.46874	0.45173	0.46334	0.40424
Solomon Islands	0.05983	0.05758	0.06079	0.05717
Somalia	N.A.	N.A.	N.A.	N.A.
South Africa	0.22007	0.22329	0.2794	0.24893
South Sudan	N.A.	N.A.	0.00372	0.0047
Spain	0.75154	0.70031	0.68412	0.63486
Sri Lanka	0.12077	0.12426	0.12668	0.11989

Country	2012	2013	2014	2015
St. Kitts and Nevis	0.43379	0.49887	0.48933	0.43847
St. Lucia	0.23421	0.23078	0.24183	0.20916
St. Vincent	0.14314	0.18231	0.18824	0.1788
Sudan	0.02035	0.02025	0.02058	0.02181
Suriname	0.17086	0.17814	0.21134	0.20333
Swaziland	0.10131	0.10343	0.13443	0.11956
Sweden	0.21477	0.20596	0.21543	0.18894
Switzerland	0.50945	0.50389	0.52557	0.46658
Syrian Arab Republic	0.03559	N.A.	N.A.	N.A.
Taiwan, China	N.A.	N.A.	N.A.	N.A.
Tajikistan	0.04675	0.05379	N.A.	N.A.
Tanzania	0.02177	0.02343	0.02358	0.02442
Thailand	0.35453	0.37963	0.45997	0.3973
Timor-Leste	0.02581	0.02575	0.03302	0.0352
Togo	0.02918	0.03037	0.0234	0.01717
Tonga	0.15937	0.16406	0.16809	0.18923
Trinidad and Tobago	0.16507	0.17851	0.1973	0.17374
Tunisia	0.13446	0.1389	0.14345	0.14848
Turkey	0.27182	0.30352	0.35153	0.31046
Uganda	0.02005	0.02171	0.02032	0.02178
Ukraine	0.30192	0.33617	0.35274	0.27018
United Arab Emirates	0.22738	0.23424	0.26441	0.27432
United Kingdom	0.49877	0.51807	0.41123	0.41277
United States	0.1326	0.1345	0.1499	0.1509
Uruguay	0.1809	0.18718	0.22974	0.20799
Uzbekistan	0.18258	0.16617	0.15215	0.15718
Vanuatu	0.18622	0.19183	0.19932	0.19363
Venezuela, RB	0.19077	0.19616	0.21285	0.19646
Vietnam	0.07836	0.08302	0.09777	0.09246
West Bank and Gaza	0.10146	0.10453	0.11654	0.11196
Yemen, Rep.	0.01724	0.01832	0.01235	0.01671
Zambia	0.04091	0.04417	0.05287	0.05318
Zimbabwe	0.05515	0.05529	0.05739	0.10986