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LABOR DEMAND IN THE TURKISH MANUFACTURING SECTOR

Doktora Tezi

Serkan DEĞİRMENCİ

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DANIŞMAN: Prof. Dr. Fatma DOĞRUEL

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SOSYAL BİLİMLER ENSTİTÜSÜ MÜDÜRLÜĞÜ

TEZ ONAY BELGESİ

İKTİSAT (İNGİLİZCE) Anabilim Dalı İKTİSAT (İNGİLİZCE) Bilim Dalı DOKTORA öğrencisi SERKAN DEĞİRMENCİ'nın LABOR DEMAND IN THE TURKISH MANUFACTURING SECTOR adlı tez çalışması, Enstitümüz Yönetim Kurulunun 30.12.2014 tarih ve 2014-42/47 sayılı kararıyla oluşturulan jüri tarafından oy birliği / oy çokluğu ile Doktora Tezi olarak kabul edilmiştir.

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ÖZET

TÜRKİYE İMALAT SANAYİNDE İŞGÜCÜ TALEBİ

Firmaların istihdama ilişkin tepkileri işgücü iktisadının en çok ilgilenilen konularından bir tanesidir. Rodrik'in (1997) hipotezine göre, işgücü talep esnekliği küreselleşme ile artmalıdır. Bu esneklikteki artış, daha yüksek istihdam oynaklığı ve çalışanlar için daha düşük pazarlık gücü açısından daha yüksek çalışan korunmasızlığı anlamına gelmektedir. Uluslararası ticaret, ürün piyasalarında rekabeti arttırması ve/veya girdiler açısından ilave ikame olanakları sağlaması ile işgücü talep esnekliğini arttırabilir. İkinci aktarım mekanizmasına odaklanarak, bu çalışma 2005-2011 dönemi için Türkiye imalat sanayindeki firmaların işgücü talep fonksiyonlarını tahmin etmekte ve dünya ekonomisi ile artan bütünleşmenin sonucunda işgücü talep esnekliğinin değişip değişmediğini araştırmaktadır. Bu kapsamda, uluslararası ticaret, uluslararası dış kaynak kullanımı ve mülkiyetin uyruğu olarak adlandırılan küreselleşmenin üç alt konusunun işgücü talep esnekliği ile olan ilişkileri araştırılmaktadır. Türkiye İstatistik Kurumu'nun (TÜİK) Yıllık Sanayi ve Hizmet İstatistikleri ve Dış Ticaret İstatistikleri olarak adlandırılan iki mikro veri seti, dengeli bir panel veri oluşturmak için birleştirilmiştir. Bu panel veri, analiz dönemi boyunca sürekli olarak faaliyet gösteren ve en az 20 çalışan istihdam eden 9342 firmayı kapsamaktadır. Türkiye imalat sanayinde işgücü talep esnekliğinin anlamlı bir biçimde değişip değişmediğini test etmek için statik ve dinamik işgücü talep modelleri belirlenmiştir. İki-yönlü statik sabit etkiler ve Arellano-Bond doğrusal dinamik panel veri tahminlerinden elde edilen ekonometrik bulgular, Türkiye ekonomisinin uluslararasılaşmasının 2005 ve 2011 yılları arasında Türkiye imalat sanayinde işgücü talep esnekliğini anlamlı bir biçimde arttırdığını göstermektedir.

GENERAL INFORMATION

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ABSTRACT

LABOR DEMAND IN THE TURKISH MANUFACTURING SECTOR

Firms' reactions regarding employment is one of the most interested topics in labor economics. According to Rodrik's (1997) conjecture, labor demand elasticity should increase with globalization. Increase in this elasticity implies higher worker vulnerability in terms of higher employment volatility and lower bargaining power for workers. International trade might lead to an increase in labor demand elasticity with increased competition on the output markets and/or by providing additional substitution possibilities in terms of inputs. Focusing on the latter channel of transmission, this study estimates labor demand functions of the establishments in the Turkish manufacturing sector for the period 2005-2011 and investigates whether the labor demand elasticity altered as a result of increased integration with the world economy. In this context, the relationships of labor demand elasticity with three subtopics of globalization are explored, namely international trade, international outsourcing and nationality of ownership. Two micro data sets of Turkish Statistical Institute (TurkStat), namely Annual Industry and Service Statistics and Foreign Trade Statistics are merged to construct a balanced panel data. This panel data includes 9342 establishments which are employing 20 and more workers and continually operating through the analysis period. Static and dynamic labor demand models are specified to test whether the labor demand elasticity has altered significantly in the Turkish manufacturing sector. The econometric findings obtained from two-way static fixed effects and Arellano-Bond linear dynamic panel-data estimations show that internationalization of the Turkish economy significantly increases the labor demand elasticity in the Turkish manufacturing sector between 2005 and 2011.

to my brother...

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LIST OF ABBREVIATIONS

AKP	Justice and Development Party
BEC	Broad Economic Categories
CA	Comparative Advantage
CBRT	Central Bank of the Republic of Turkey
CDA	Comparative Disadvantage
CES	Constant Elasticity of Substitution
CGE	Computable General Equilibrium
CIF	Cost, Insurance and Freight
CPA	Classification of Products by Activity
CPC	Central Product Classification
CU	Customs Union
EU	European Union
FDI	Foreign Direct Investment
FE	Fixed Effects
FED	Federal Reserve System
FOB	Free on Board
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
GNP	Gross National Products
HLFS	Household Labor Force Survey
HO	Heckscher-Ohlin
IMF	International Monetary Fund
ILO	International Labour Organization
ISIC	International Standard Industrial Classification
IT	Information Technology
LRD	Longitudinal Research Database
MNE	Multinational Enterprise
NACE	European Industrial Activity Classification
NE	National Enterprise
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
PPI	Producer Price Index
R&D	Research & Development
SBTC	Skill Biased Technological Change
SITC	Standard International Trade Classification
TISK	Turkish Confederation of Employer Associations
TurkStat	Turkish Statistical Institute
UK	United Kingdom
US	United States
WB	World Bank
WTO	World Trade Organization

"…The demand blade of the labor-market scissors has become like the Cheshire Cat: It is there, but it is often difficult to spot." (Hamermesh, 1993, p.8).

1. INTRODUCTION

This first chapter of the dissertation explains theoretical and empirical motivations behind the research and presents the aims of the study by linking them to the main research questions. Lastly, the outline of the dissertation briefly summarizes the contents of subsequent chapters following the flow of study.

1.1. Motivations and Aims of the Dissertation

After the shift of dominant development strategies from inward-oriented import substitution to the outward-oriented export-led industrialization policies at the end of 1970s, structural adjustments and/or stabilization programs have been adopted in many developing countries at the beginnings of 1980s. There are two major policy sets of these programs regarding employment growth, namely labor market flexibility and international trade. First one of these policies put the labor costs into the center of the mechanism as a determinant of labor demand and argues that labor market regulations lead to rigidities and increase labor costs. Second argument of these policies is that international trade activities augment the production and employment levels with the comparative advantage (CA) in labor-intensive exporting sectors of developing countries based on Heckscher-Ohlin (HO) theorem. Besides, these two policies are so nested. Labor market flexibility has a critical role on the impacts of international trade for the employment growth. Thus, if the labor markets are sufficiently flexible, in other words, if the labor market regulations do not prevent the downward flexibility of real wages, then international trade boost the production and employment growth. But the consequences observed in many developing economies were not in line with these expectations during the years in the post-liberalization period.[1] High unemployment rates and instabilities in economic growth rates have kept its importance and severeness during 1990s and 2000s. Nevertheless, these concerns for employment have caused to

[1] See Horton et al. (1994), Amsden and van der Hoeven (1996), Amadeo and Horton (1997), Crotty and Dymski (2001), van der Hoeven and Saget (2004), Pollin et al. (2004), Onaran (2007), Demir and Erdem (2010).

spread the conventional view that the unemployment problem is sourced due to rigidity of labor markets in these countries, albeit they have intense international trade activities with developed countries, liberalized financial systems and reformed labor markets.

Tremendous increases in unemployment rates during 1990s have also triggered the discussions about the sources of this problem in developed economies.[2] Many economists have argued that the lack of flexibility in labor markets and the unresponsiveness of real wages to the unemployment were the main reasons of these high unemployment rates.[3] Therefore, many countries tried to solve the employment problem essentially through policies designed to increase labor market flexibility.[4] In addition to that wage inflexibility claim, they have also emphasized the lack of job creation capacity in developed economies, despite decreasing share of wages in total incomes and increasing share of profits.[5] In terms of labor market policies, all these discussions indeed point to the responsiveness for the demand side of the labor market rather than conventional neoclassical supply-side arguments about wages and rigidity of labor markets.

Turkey, following other developing countries, has also strictly implemented the standard orthodox structural adjustment/stabilization programs since 1980s. But the favorable consequences of these policies on the employment growth were so limited, even inadequate against population growth. Especially, on the contrary to the theoretical expectations, weak employment performance of the manufacturing sector is one of the most disappointing results of these post-1980 policies.[6] This is mostly because of the expectations from the rapid increase in the exports volume of Turkish manufacturing sector after the policy shift in trade regime but the employment generation was bleak in the aftermath of 1980 liberalization act. Therefore, the disappointments by these policies also initiated the subsequent everlasting discussions about the flexibility of the Turkish

[2] See Siebert (1997).
[3] Blanchflower and Oswald (1994), Allen and Freeman (1997), OECD (1997) are some studies exploring the responsiveness of real wages to the unemployment.
[4] However, these policies did not work well in decreasing unemployment. They instead lead to spread of low-paid, part-time and temporary jobs and even to two-tier labor markets.
[5] The declining trend of labor's share in OECD countries since 1970s and 1980s is reported by the OECD (2007) and the IMF (2007). There are also past contributions (Epstein, 2000; Harrison, 2002).
[6] See Taymaz (1999), Erlat (2000), Dietzenbacher and Gunluk-Senesen (2003), Tunali et al. (2003), Guncavdi and Kucukcifci (2004).

labor market. Many country reports of the international institutions such as World Bank (WB) and International Labour Organization (ILO) have emphasized the role of flexible labor markets to increase the demand for labor, especially emphasizing the institutional barriers in Turkey which hamper the increase of labor cost elasticity of labor demand.[7] Another discussion was about the employment generation potential of the Turkish economic growth. Some economists argue that this is not only an economic but also a very important social issue of Turkey and deserves a serious analysis (Ansal et al., 2000, p.1). More importantly, these two discussions about the reasons behind inadequate employment generation performance have continued to be one of the main concerns of economists and policymakers up till today in Turkey.

2000s in the Turkish economy is a different period than the previous two decades especially in terms of its relative macroeconomic stability (particularly in terms of fiscal stability), international trade activities and the reflections of these international trade activities into the current account balance and labor markets.[8] Export and import volumes have substantially increased in the first decade of this second millennium (see Table 2.2). However, import dependency of exports has also increased so much due to overvalued TL and other relevant factors during this period. But the employment growth is again so weak, especially in the manufacturing sector.[9]

According to theoretical studies, most notably first in Rodrik (1997), it has been argued that international trade will result in an increase of labor demand elasticities. He argues that increasing competition in product markets, decline in trade protections and the manufacturing imports of less developed countries should increase labor demand elasticities.[10] Moreover, international trade has led to some shifts on the organizational structures of domestic firms and also altered their production technologies mostly via imports of intermediate inputs to strengthen their competitiveness in world markets. Therefore, the impacts of international trade are not only limited with high production volumes but also they contribute to the adoption of different (new) production practices. All these factors give rise to the changes in labor demand behaviors (or incentives) of

[7] For instance, see World Bank (2006).
[8] See Chapter 2 for more details about the Turkish economy in 2000s.
[9] Total employment in the manufacturing increased about 1 million from 2000 to 2013 (TurkStat, 2014a).
[10] See Chapter 3 for the details of theoretical mechanisms behind this argument of Rodrik (1997).

firms. So their adjustment mechanisms for the changes of employment level should have operated in a different manner with more intense international trade activities.

Turkish manufacturing sector is the major export and growth engine of the Turkish economy.[11] At the same time, majority of imports are also realized in that sector due to the necessity for intermediate inputs and capital goods to produce and to export tradable goods.[12] So, it is not wrong to say that outward-oriented trade activities are very intense in the manufacturing sector among other sectors in Turkey. Therefore, in parallel with the theoretical explanations abovementioned, we expect that firms in the Turkish manufacturing sector, especially those which directly engaged in intense export and import activities, should be more exposed to feel the necessity of altering their labor demand behaviors during the periods in which international trade expanded.[13]

On the other hand, Turkish economy has experienced two major economic crises (2001 and 2008-09) in the last decade. First one basically was a result of fragile banking and finance sector and stemmed mostly from domestic vulnerabilities transferred cumulatively from 1990s. The latter one was the reflection of an exogenous global economic crisis into the Turkish economy. We also think that labor demand behaviors of firms have altered after those two major contraction periods of the economy and we expect that the effects of these adjustments have also modified labor demand elasticities.

Why does it matter to calculate labor demand elasticities? As we mentioned so far, one of the conventional expectations of the neoclassical theory with intense international trade activities is an upsurge in the employment growth. But whenever these expectations are not matched with employment increases, the rigidity of the labor markets is frequently alleged as one of the fundamental culprits of sluggish employment growth. Theoretically, there is an expectation that if the labor costs are decreased and/or high economic growth rates are succeeded, then the employment growth is supposed to be rapidly positive. However, labor demand should be responsive to these exogenous changes to satisfy these expectations. Neoclassical economics argue that institutional

[11] For instance, export volume for manufactured products is 141.3 billion dollars and the total export volume is 151.2 billion dollars in 2013 (TurkStat, 2014b). Also, see Table 2.5.
[12] 78 percent of total imports are the manufactured products in 2013 (TurkStat, 2014b). See Table 2.5.
[13] See Chapter 2 for more details about the employment in the Turkish manufacturing sector.

barriers such as strict labor market regulations hinder this mechanism and decrease the labor demand responsiveness of firms. Otherwise, some changes in international trade volume, technology level and institutional structure that increase the competitiveness of the product markets are expected to enhance the labor demand responsiveness of firms with respect to labor costs and economic growth.

Especially, thanks to the increases in international trade activities, it is expected that goods markets will be more competitive (and the price elasticity of product demand will increase), and this will lead to the increase in the labor cost elasticity of labor demand since the labor demand is a derived demand. Again, with the increases in international trade activities, it is expected that foreign production factors will be substituted with domestic labor and this will again lead to the increase in labor cost elasticity of labor demand. On the other hand, another expectation with increasing trade activities is that it will stimulate the foreign demand for domestic goods (exports) and this will boost the economic growth rates.[14] And so, this growth will necessitate an employment increase in labor-intensive exporting establishments of manufacturing sector. This will also increase the economic growth (output) elasticity of labor demand. In other words, this kind of economic growth will create additional employment opportunities. This idea is basically an outcome of Hecksher-Ohlin and Stolper-Samuelson theories of neoclassical economics. Besides, it is strongly believed that technological and institutional changes follow these intense international trade activities, and they ease and accelerate this process by enhancing competitiveness of the markets.

However, when we take a glance at the Turkish economy since 1980s, we observe that these neoclassical theoretical expectations are not met to a large extent. Especially in 1980s, these are the following years after trade liberalization act early in 1980; we observe that real wages were heavily depressed, export volumes were rapidly increasing but employment increases were so low relatively. This weak employment generation performance is also same in the export-oriented firms of the manufacturing sector. Some authors argue that these export-oriented firms did not invested heavily to expand their present production capacity in this period, instead they just used their spare

[14] See Chapter 3 for the details of the determinants of labor demand elasticities.

capacity remained from previous years. Moreover, they argue that these firms tried to adopt new technologies just to increase their export volumes rather than increasing their employment levels. In the following decade, especially 1990 onwards, these low real wages have been readjusted upwardly thanks to the populist policies inter alia. But then, these firms frequently tended to use contract manufacturing with informal employment practices to compete with international exporters in foreign markets with respect to production costs. However, after the currency crisis of 1994, real wages again depressed and frequent economic contractions also accompanied to the second half of 1990s. Therefore, 1990s were the turbulence years again with low employment generation performance in the economy and in the manufacturing sector.

To sum up thus far, the fundamental motivation behind this dissertation study is to understand whether the labor demand is responsive to the changes in labor costs and economic growth in the Turkish manufacturing sector. If so, or not, we attempt to understand the reasons behind the mismatch with the expectations of neoclassical theory and observations regarding sluggish employment growth. At this stage, we may ask our next motivating question that why it matters to understand this responsiveness of labor demand and its reasons for the case of Turkey.

This is important in two aspects. If we consider the labor costs, there are longstanding discussions in literature about the level of wages (especially for minimum wages) and labor taxes.[15] While some economists argue that minimum wages are higher than the equilibrium wages in the market and this creates an imbalance (unemployment) between labor demand and supply, other economists argue that it is not a correct and/or unique solution to decrease the minimum wages to vanish unemployment. On the other hand, again some economists argue that labor taxes should be decreased, so the labor costs will decrease and employers will be more likely to hire additional workers. But on the other side, opponents to this idea argue that this decrease in labor taxes does not encourage employers to hire additional employees, but at most maybe they start to pay social security contributions for their unregistered workers. So, this does not offer a solution to the unemployment problem, maybe just partially decreases the informality.

[15] For instance, see Linneman (1982), Currie and Fallick (1996), Kramarz and Philippon (2000).

From the point of wage declines, we observe many sub-periods with wage depressions and low-paid informal jobs are so spread in the Turkish labor market since 1980s. However, we do not observe remarkable employment growth in return to these wage depressions.[16] Again we observe some discounts in labor taxes, but we do not observe an equivalent increase in employment levels. Therefore, there seems the labor cost elasticity of labor demand in the Turkish labor market is not so much elastic, even inelastic. Is it really true? Or is it just the visible side of the problem? These questions should be answered and they seem to be more empirical rather than theoretical.

From the point of economic growth, this is one of the much-discussed subjects within the Turkish economy literature. This is because the composition and sources of economic growth really matter to understand the employment generation potential of the economic growth. Whether economic growth is mostly driven by domestic demands, investments, government spendings or net exports or not and the direction of changes in these components are the critical issues to understand whether the economic growth is employment-friendly or not.

When we estimate the labor demand elasticities, we expect to get concrete quantitative evidences to discuss whether declines in wages or labor taxes are effective or not on the labor demand, and whether the composition of economic growth is efficient to create additional employment opportunities or not. And so we will able to make sound interpretations based on estimates rather than guestimates based on the anecdotal evidences. When we able to do that, this provides us a background to understand the mechanisms behind the reflections of macroeconomic indicators into the labor markets. Consequently, we are able to make reliable comparisons between the theoretical expectations and empirical evidences. This kind of description for the status quo is also necessary to analyze the future developments of the labor market.

Another question motivating for this study is that why we need to compute the labor demand elasticities for the manufacturing sector. As we mentioned above, it is the major sector in which the greater part of exports and imports taken place. So we

[16] See Boratav et al. (2000), Metin-Ozcan et al. (2001), Onaran and Yenturk (2001), Onaran and Stockhammer (2005), Yenturk (1997).

theoretically expect that international trade affects the manufacturing sector at most thorough the channel of labor demand elasticities. Besides, the share of paid employees in that sector is so high vis-à-vis other non-agricultural sectors in economy. This creates an expectation that manufacturing sector should be more responsive to the policy changes in labor costs than other sectors. In addition to that, manufacturing sector is the engine of economic growth in the Turkish economy. So, following the theory, we expect that positive economic growth creates more employment opportunities in that sector, especially in labor-intensive exporters within the manufacturing sector.

To sum up, in parallel with theory, we expect that international trade is an important determinant of changing labor demand behaviors for the firms in the manufacturing sector. The level of labor costs is a crucial factor to compete in foreign markets for exporter firms and in domestic markets for firms which compete with imports. The technologies newly adopted by international trade are important to determine the labor-intensiveness of the production structure. Thus, international trade is a critical determinant for both labor cost and output elasticities of labor demand. Consequently, computing elasticities and determining the factors behind them for the manufacturing sector gives us an opportunity to figure out some mechanisms to be used in industrial policies regarding the employment and unemployment issues. At the end, we are also able to analysis the reflections of international trade policies into the labor demand incentives of the manufacturing sector. This is so important for the Turkish economy since the employment policies are becoming day by day strongly linked with the global economic conjecture.

In consequences of all these theoretical and empirical motivations behind our inquiry, the general aim of this dissertation study is to analyze the demand side of the labor market for the Turkish manufacturing sector in terms of labor demand elasticities. We hope that the results of this research contribute to the literature by providing theoretical and empirical evidences for the demand side of the Turkish labor market.

In line with the motivations explained thoroughly and aims put forward, this dissertation study attempts to shed light on the main research questions given in the next subchapter.

1.2. Research Questions

The main research questions in this dissertation are also the most fundamental questions in the labor demand literature: How do employers react to the changes in labor costs and in output growth? Do these reactions differ by globalization? In the context of this dissertation, these major inquiries for labor demand behaviors are transformed into the following sub-questions:

(1) What is the labor cost elasticity of labor demand in the Turkish manufacturing sector between the years 2005 and 2011?

(2) What is the output elasticity of labor demand in the Turkish manufacturing sector between the years 2005 and 2011?

(3) Do these elasticities change with globalization?

Particularly, the third question is the major interest in the empirical parts of this research. The impacts of globalization on the labor demand elasticities promise us to understand the traits of the Turkish labor market both for today and for the future.

1.3. The Outline of the Dissertation

The setup for the rest of this dissertation is as follows: Chapter 2 attempts to link the labor market and international trade policies of Turkey with the labor market and international trade performance, focusing on the manufacturing sector since 1980s. Chapter 3 exhibits the core of static and dynamic neoclassical labor demand theories to specify the equations for labor demand estimations and explains the determinants of elasticities. In Chapter 4, various studies in the empirical literature of labor demand are compiled by focusing on the selected three issues of globalization, namely international trade, outsourcing and nationality of ownership. Chapter 5 describes the micro datasets used throughout the empirical part and limits the datasets to an operational sample presenting the background of econometric methodologies to be applied in the estimations. Chapter 6 addresses the empirical specifications to be estimated and discusses the variables to be included in econometric analyses, then presents and comments the findings of empirical analyses. Chapter 7 concludes the study discussing the findings of research and suggests some directions for further studies.

2. THE TURKISH ECONOMY: LABOR MARKET-INTERNATIONAL TRADE LINKAGE

This chapter first aims to discuss major labor market and international trade policies considering the critical historical milestones of the Turkish economy through the recent three decades. Then the performances of the Turkish labor market and international trade are shortly presented to infer the outcomes of these policies. Most of the emphasis is given to the manufacturing sector. Besides, as it is mentioned in the introduction chapter, labor market and international trade are two closely interrelated subjects in terms of employment growth and the outcomes of them interactively affect each other. Before proceeding with theory and empirical work for the effects of internationalization on labor demand, these policies and their consequences are the points to be considered together. Therefore, it makes sense to discuss these policies and the resulting outcomes of them respectively to get intuition for the background of potential links between labor demand and international trade in Turkey, and then we present the theoretical and empirical evidences through the rest of dissertation.

2.1. Labor Market Policies and Labor Market Performance

In this first subchapter, the aim is to understand the effects of labor market policies on the employment performance. To that end, we particularly consider two crucial periods in which economic and political transformations have been experienced in the recent history of the Turkish economy, namely 1980 and 2000 onwards. These two periods have also critical importance on the transformation of international trade policies and trade performance. So, in parallel with labor markets, we also assess the effects of these policy shifts on international trade in the second subchapter. Therefore, the overall aim is to attain a sound understanding for the close relationship between these two prominent and close pillars of the Turkish economy.

In the empirical literature, the findings are mixed for the commonly-held view which argues that rigid labor market regulations and generous social protection systems

result with the poor performance of labor markets.[17] This also leads to a discussion on whether labor market policies can explain the variations of labor market performances for cross-country comparisons, and if so, which policies matter for these comparisons is frequently debated in the literature. However, mostly due to lack of datasets, empirical literature is not so rich for the cases of developing country, including Turkey. So, in this subchapter, rather than just focusing on the small-scale policy changes regarding labor markets, we also aim to compile the reflections of significant historical policy shifts of the Turkish economy on labor markets and to link them with the outcomes observed in the Turkish labor market. The outcomes of labor market are assessed with the main measures of employment, unemployment and inactivity rates.

2.1.1. Labor Market Policies: Literature and Turkey

Although there is an inconclusive debate about the extent for the role of policies which ruling the labor market performance, it is clear that they are influential on both labor supply and labor demand. Dynamic employment (such as hiring and firing) decisions of firms as well as the labor supply incentives of individuals are both affected by the labor market policies. However, it is hard to disentangle the net effect of a given policy change on the employment or unemployment rates.

There are two general views in the literature about the relationship between labor market policies and their outcomes. On the one hand, policies are considered as one of the culprits for the disequilibria in the labor markets, and on the other hand, they are evaluated as required arrangements to insure and protect the vulnerable portion of the workers.

According to the first viewpoint, any regulation or policy can distort the market equilibrium and may lead to disequilibria between wages and marginal products. Additionally, the sensitivity of labor markets is reduced as a consequence of these policies and so the adjustments may slow down, even may halt. Moreover, policies may transfer rents from employers to employees by various channels such as with trade

[17] Some proponents of flexibility argue that rigidities are the main reasons of labor market problems (IMF, 2003; OECD, 2006), others argue that security is more efficient (Baccaro and Rei, 2007; Howell et al., 2007).

unions and public employment schemes (Calderon et al., 2007). Consequently, deregulations are needed to equilibrate the demand and supply sides of the labor market.

On the other hand, according to the second view, labor market policies have crucial distributional functions and can enhance the efficiency by protecting employees against the possible risks of the market. By increasing the wage incomes of labor, these policies can also increase the aggregate demand and so boost the economic growth. Employers may be spurred on the investments for the technologies to increase the labor productivity when these policies are in place (Freeman, 1993). So, instead of simply reducing labor costs, employers can invest on human resources. Therefore, in addition to the productivity gains, some standards for labor and social security measures may alter the matching of the skills with employers. Hence, deregulations for labor market are not beneficial for employment and growth in that setting.

The evidences of empirical studies testing these two conflicting ideas are mixed. While some studies argue that rigid labor markets and strict employment protection legislations result with worse labor market performances, other studies find that labor market institutions and policies avoid poor labor market outcomes. Therefore, the incentive mechanisms of these policies and institutions which work in opposite ways lead to studies to be mostly empirical than theoretical. In this context, empirical studies especially have focused on the relationship between flexibility and security (together known as flexicurity) in recent decades. According to this recent approach, policies may have both employment enhancing function without limiting the flexibility of employers and employees. Particularly, in the periods of economic crises, various employment and output outcomes for different countries revived the interest for this kind of labor market policies. In these periods, countries with more flexible labor markets have performed worse than countries with high internal flexibility and social security together.[18] However, in the absence of protection measures with high external flexibility, countries have experienced high unemployment rates (Watt and Leschke, 2010; Aiginger et al., 2012).[19] Therefore, for many cases, the combination of flexibility and security measures

[18] Internal flexibility is about the flexibility in job boundaries and job design for multi-skilled workers (Taymaz and Özler, 2005).

[19] External flexibility is about the functioning of labor markets and focuses on wage and numerical flexibilities. Wage flexibility is the adjustment of wages in the labor market and numerical flexibility is the adjustment of work force (Taymaz and Özler, 2005).

is asserted as an optimal policy mix to contribute both employment and growth, particularly in developed countries.

However, developing countries, including Turkey, are generally suffering from the lack of many crucial labor market institutions and policies. Nevertheless, there are recent attempts to analyze the effects of policies on the performances of labor markets in these countries. Before giving details about the Turkish labor market, vast majority of the labor markets in many developing countries has similar common characteristics with a dual structure, very narrow social security coverage and limited collective bargaining schemes. In other words, a large informal sector exist side-by-side with a relatively small formal sector. Besides, the flexibility in developing countries is characterized with almost no security (De Gobbi, 2007). Self-employment and micro economic units are common with unpaid family workers and atypical contracts. The share of employment in agriculture is still high but declining in many cases. Therefore, the formal protection regime of labor codes and regulations does not cover the majority of labor force. Since the productivity is so low in the informal sector, employers do not want to bear with the additional costs of security provisions for their workers. Moreover, employment and labor force participation rates are generally low, but the unemployment rates are high, particularly for young and female participants of the labor market.

Considering the performance of the labor market institutions and policies, recent trends in the Turkish labor market with low level of unionization, huge informal sector, high unemployment and underemployment rates and with low female labor force participation rates do not reflect a different picture than the average characteristics of the labor markets in developing countries abovementioned.[20] Nevertheless, some reforms have been announced to promote the employment generation and to enhance the human capital in recent years. The Employment Package of 2008 promotes the job opportunities for women and youth. Besides, some active and passive labor market policies including unemployment insurance and training for young workers are put into use. Moreover, with the Labor Law of 2003, the restrictions against temporary contracts are decreased and a legal basis is provided for atypical contracts. However, these

[20] According to the Ministry of Labor and Social Security, the unionization rate is 8.88% as of 2013.

policies are also criticized due to excessive flexible structures without ensuring protective measures. Moreover, there are serious problems with job safety in Turkey.

These policy reforms in the labor market sphere are for sure not independent from the macroeconomic policies of current and previous decades. Since the main focus of this dissertation study is to understand the implications of globalization on the demand side of the Turkish labor market at large extent, it helps us to be comprehensive starting our descriptive policy analysis with the initial integration periods of the Turkish economy to the world economy. These are the years that coincide with trade liberalization period of Turkey in 1980s. To that end, the labor market policies in Turkey are discussed in the next section together with the delineation of macroeconomic environment in the post-1980 liberal era. Particularly, the implications of trade liberalization act on the labor market policies are the main focus of interest in this part.

2.1.1.1. The Post-1980 Period: Implications of Trade Liberalization on the Labor Market

After following import substitution strategy in 1960s and 1970s, Turkey faced with a severe balance of payments crisis (lack of foreign exchange) at the end of 1970s parallel with oil (1973-74 and 1979) shocks and inflation crises in the world and in consequence of artificial precautions to the structural problems with protecting present model in 1970s. As was the case in other most of the developing and underdeveloped countries, Turkey also attempted to overcome these problems by shifting from import-substituting industrialization strategy to an outward-oriented export-led growth model characterized by a liberalization of trade and then of the financial system.

At first, the unique aim was to find foreign exchange to discharge the debts. To do this, first a standard stabilization program was announced, and then an accelerated reform and adjustment process began in the whole economic system during the 1980s. This far-reaching reform process consisted first the liberalization of the foreign trade regime and the financial sector and culminated with the liberalization of capital accounts in late 1989.

Therefore, Turkey has undergone substantial structural changes including in international trade and labor markets after 1980s. These changes rapidly restored the economy from a prolonged crisis in the late 1970s and produced positive results, particularly in its short-term international trade performance. However, persistent policy failures were maintained in subsequent periods, contributing to volatility of inflation, macroeconomic instability, and weak investment rates. Meanwhile, exogenous external crises such as regional combats in the Middle East, economic disruptions in trading partners, and financial contagion, have dampened the economy and so the labor market. All these structural changes have implications in terms of transformations on different sectors of the Turkish economy.

From the point of employment, we should evaluate the labor demand performance of the manufacturing sector regarding the macroeconomic developments during the decade which we briefly described above. With the trade liberalization act in 1980, the Turkish industrialization also went into a new period in 1980s. In this first decade of export-oriented growth model, real wages were depressed so much to catch an advantage in global competition and the value of Turkish lira (TL) was kept low to gain relative price advantage in foreign goods markets.[21] Additionally, idle production capacities established in 1970s were intensively used in 1980s and so the production level in the manufacturing sector considerably increased. Moreover, credits and financial incentives promoted this production and its exports. Therefore, the export volume of manufactured goods increased tremendously in this period.

However, new investments in the manufacturing sector were not brilliant in that period; they were even lower than 1960s and 1970s.[22] This tendency has also extended over 1990s and 2000s. As we mentioned, production increases were heavily by means of available capacity utilization. So, despite that depressed real wages and undervalued TL provided low production costs and price advantages for the Turkish manufacturing firms in foreign markets, and so the production and exports increased, but employment

[21] The initial years of this period are characterized with a military coup and change in the constitution as well as in the labor code. These new institutional and legal instruments inherited from the military phase (1981-83) are used by the consequent civil administrations to control labor incomes (Boratav et al., 1996).

[22] *Gross fixed investments of the private sector increased by 14.1% during 1983-87, only a small portion of this amount was directed to manufacturing. The rate of growth of private manufacturing investments has been on the order of half of this figure, at a rate of only 7.7% per annum, and could not reach its pre-1980 levels in real terms until the end of 1989* (Boratav and Yeldan, 2006, p.6).

growth was so bleak in that period. Some economists commented that labor demand elasticity in the manufacturing industry is more responsive to investments rather than real wages in 1980s (Yenturk, 1997). This may be one of the reasons behind low employment performance in that decade, because neither positive production growth nor wage declines generated adequate employment possibilities.

In parallel with these developments, following the macroeconomic atmosphere, the Turkish labor market also experienced a significant structural transformation since early 1980s. The fundamental changes in the labor market are decreasing share of agricultural employment, falling labor force participation rates (especially for women), increasing informalization and subcontracting, decreasing bargaining power of workers, eroding real wages and increasing unemployment rates, increasing labor market flexibility, and the weakening of the link between economic growth and employment (Boratav, 2009; Şenses, 1994, 1996; Mütevellioğlu and Işık, 2009: 160; Demir and Erdem, 2010, p.12).

Therefore, as Çam (2002: 89) suggests, since the outset of the neo-liberal era in Turkey, temporary employment has risen, unionization has declined, employment prospects have deteriorated and employees' earnings have diminished in real terms. Such developments made Turkey a 'better' place for capital, not for labor.[23] Yet they also caused a growing inequality in overall income distribution, and political unrest across the country.

In short, the stabilization and structural adjustment programs undertaken by a large number of developing countries (as Turkey) had a rather similar orientation as far as workers' positions and situations were concerned. Control of inflation was the main aim even though the cross country evidence showed that, except in hyperinflation situations, it had negligible effect on economic growth. Employment was not a primary concern under the structural adjustment or stabilization programs either. They focused heavily on improving productive efficiency. Increases in unemployment rates following trade liberalization acts, privatizations of state economic enterprises, or general institutional restructuring was seen as regrettable but accepted as a necessary cost for

[23] What the new, post-military coup environment implied for workers and their representatives was succinctly summarized by the president of the Turkish Confederation of Employer Associations (TISK) who was quoted as saying that "For years on end the workers laughed and the employers cried, now the time has come for the employers to laugh" (Nichols and Suğur, 2004, p.154).

improving efficiency and becoming internationally competitive. Indeed, the employees in the formal sectors were evaluated as privileged and fortunate, beneficiaries of an inefficient, protected system, who gained at the expense of the rural and informal sectors. Thus, increases in unemployment rates of the formal sector were regarded as a necessary expected consequence of the economic rationalization. Abandonment of trade protections and more or less exclusive reliance on exchange rate adjustments to manage balance of payments disequilibria further contributed to the weakening of real wages in a number of developing countries as in Turkey (Haque, 2004, p.8).

2.1.1.2. The Post-2000 Period: Imported Intermediate Inputs and Unemployment

After financial crises in 2001, flexible exchange rate regime has been put into effect and first implicitly, then explicitly (2006) inflation-targeting policy has been adopted by the Central Bank of the Republic of Turkey (CBRT). During that period, with the stabilization of inflation and fiscal balance, and with the strict regulations in the banking sector, foreign capital inflows have accelerated and TL has been overvalued. This did not encourage exports, but low real wages with high productivity helped to decrease production costs and triggered exports.

However, imports have enlarged more than exports, and foreign trade imbalance has reached to significant amounts, so caused to deteriorations in the current account balance during 2000s. Some authors argue that these are the results of unplanned industrial production policies with highly dependent on imported intermediate inputs and low competitiveness of the firms in the Turkish manufacturing sector. They support their arguments by pointing out the share of imported intermediate inputs within total imports of the manufacturing sector. This share has increased so much and reached to nearly 70 percent in 2000s (see Table 2.4.b). According to them, the production capacity of intermediate and investment inputs in the domestic manufacturing sector implies the level and depth of industrialization in a given economy. Therefore, Turkish industrial production process shows that its import dependency has increased over time rather than decrease. On the other hand, some economists argue that this high import necessity is the inherent result of high growth rates with high consumption and increasing

investments. However, independent from its causes, this increasing trend in the imported intermediate inputs may lead to the substitution possibilities of domestic labor with foreign production factors. This is also one of the subjects what we try to understand in the empirical work of this dissertation study (see Chapter 6).

During this decade, as we tried to summarize the main characteristics above, the major problem is low savings and so low investment rates. In 2000s, average savings rate are 16.5 percent and investment rates are 19.6, and so the saving deficit has increased. Some economists comment that this situation is the source of jobless growth. Worse than that, this domestic saving deficit always necessitates foreign capital inflows, i.e. foreign savings. However, these short-term instable fund flows are not healthy sources to finance the investments. Hence they do not feed the savings, so it does not turn into the investments, contrary they lead to further increases in consumption expenditures. This is why the share of manufacturing industry in GDP has decreased in the last decade (see Figure A.6). And this creates vulnerabilities for the economy; it frequently leads to foreign trade deficits and current account deficits over time. So, persistent inflation and fiscal imbalance problems of 1990s give their places to new imbalances known as foreign trade deficits and high unemployment problems in 2000s.

2.1.2. Labor Market Performance in the Post-1980 Period

In this section of the chapter, the aim is to evaluate the performance of the Turkish labor market in the post-1980 period. To that end, the long-run trends of the major labor market indicators are observed to provide a basis for our descriptive analyses. However, there are some limitations. Since these outcomes of the labor market are not independent from the policies implemented during the periods after 1980s, they may be assessed as the results of these policies keeping in mind the possible lags. Another limitation for this analysis is that the first announcement of the formal regular statistics about the Turkish labor market by the TurkStat dates only back to 1988.

The non-institutional civilian population of Turkey increases from 53 million to 75 million between 1998 and 2013. The share of adult population (aged 15 and over) in total population is increasing from 63% to 75% in the same period. Therefore, the working age population is expanding in Turkey, while it is 33.7 million in 1988, as of

2013 it is 55.6 million. In line with this expansion, the labor force (sum of employed and unemployed population) is growing from 19.3 million to 28.3 million. The employed portion of the labor force reaches to 25.5 million in 2013 from 17.7 million in 1988. Therefore the unemployed population grows from 1.6 million to 2.7 million during the same period (see Table 2.1). The traits of these labor market statistics for the disaggregations by gender and rural-urban locations differ substantially. Table 2.1.a and Table 2.1.b summarize these stationary disparities. Of course these static comparisons of statistics between initial and end points of the given period do not claim the existence of continuous trends without any drastic changes over time. Particularly, in economic crises years, these major indicators alter with abnormal adjustments both in labor supply and demand. 1994, 2001 and 2008-2009 are three major economic crises periods in the recent history of the Turkish economy. Thus, while considering the labor market policies, these contraction periods of the economy necessitate separate assessments apart from the evaluations of regular policy implications.

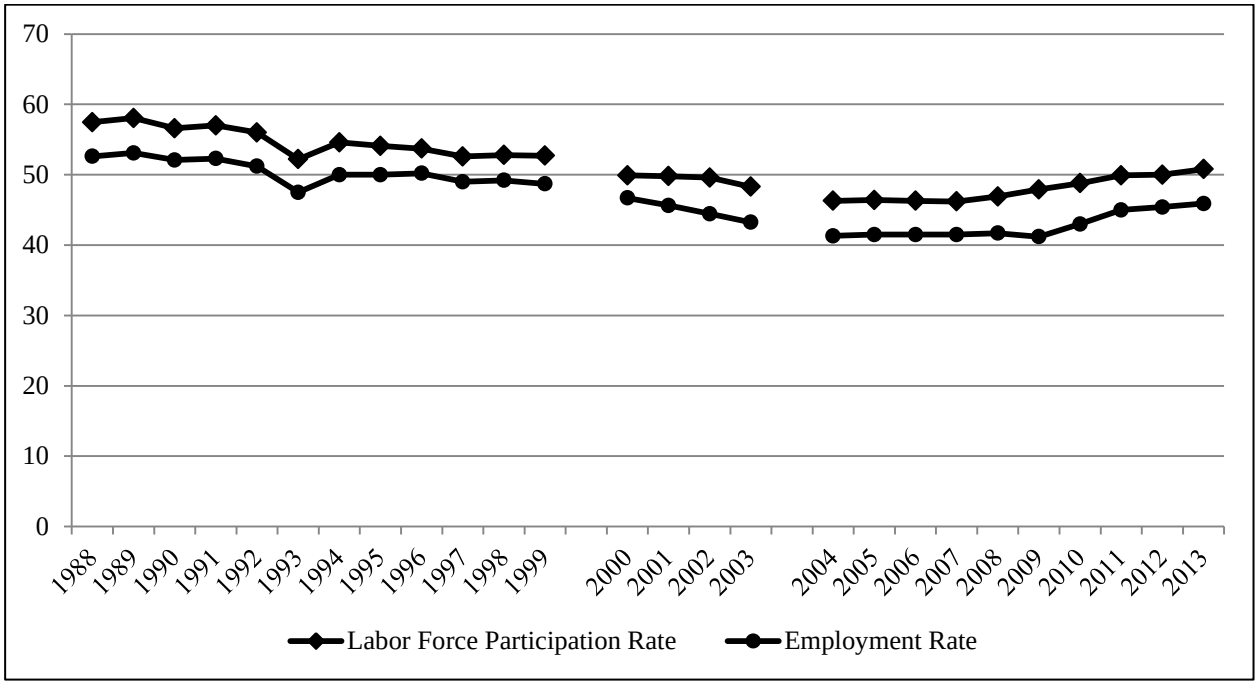
According to the October round results of first regular Household Labor Force Survey (HLFS) data of TurkStat in 1988, agricultural employment is around 8.2 million. During 1990s agricultural employment is increasing with an average 8.8 million and reaching maximum to 9.8 million in the April round of 1999 survey. However, in the October round of 1999 survey, agricultural employment is decreasing to 7.9 million. This decreasing trend starting with the end of 1990s continues through 2000 onwards. Annual agricultural employment is decreased to 7.2 million in 2003. But, according to the newest calculations based on the population projections of 2008, the level of agricultural employment is so low compared to old series starting with 1988 and 2000. Hereunder, agricultural employment is around 5.7 million in 2004, decreasing 4.9 million in 2006 and 2007, but then after the 2008-2009 crisis, it is again increasing to 5 and even to 6 million as of 2013. Consequently, in overall, the share of agricultural employment in total employment has a declining trend from 46.5% to 23.6% between 1988 and 2013 (see Figure A.1). Thus, non-agricultural employment has an increasing trend from 1980s to 2013. Therefore, sectoral composition of employment since 1980s is shifting from agriculture to non-agricultural sectors. This shift is heavily from agriculture to services sector because the share of industrial employment does not alter so much in the last three decades (see Figure A.2). In the October round of 1988, the

share of industrial employment in total employment is 16% and this percentage varies between 15% and 19% from 1990 to 1999. This share does not change at the initial years of 2000s. But just between 2004 and 2008, the share of industrial employment rises to 20%. However, after the crisis of 2008-2009, it again declines to 19 percent. So, this implies that the positive changes on the share of services employment are larger over these three decades. While the share of services employment in total employment is fluctuating around 35% in 1990s, it upwardly shifts to 40% at the beginning of 2000s. Then it climbs first to 46%, then to 50% from 2004 to 2013 (TurkStat, 2014a).

One of the most important indicators of the labor market is obviously the labor force participation rate. This rate gives us information about the extent of potential labor supply for the population above 15 aged and over. There is a well-known decreasing trend for the labor force participation rate in the Turkish labor market through the last three decades. While it is %57.5 in 1988, as of 2013 this rate is 50.8% (see Figure 2.1, Figure 2.3 and Table 2.1). The gap between male and female labor force participation rates are one of the most remarkable characteristics of the Turkish labor market. Although male participation rate decreased from around 81% to 71% between 1988 and 2013, female participation rate decreased first from around 35% to 23% between 1988 and 2004, then increased slightly to 30 percent in 2013 (see Table 2.1.a).

Together with labor force participation rate, employment rate is another crucial indicator to assess the performance of the labor market. It implicitly gives us information about the labor demand. Since the employment rate is the share of employed individuals among 15 aged and over population, it gives the extent of labor demand in the labor market. As in the labor force participation rate, there is a declining trend for employment rate in the period since 1988. Although the employment rate is around 50% during 1990s, it decreases to 45% at the beginning of 2000s, and then it reaches to at most 45% in the remaining years up to 2013. Therefore, it is clear that labor force outpaces employment level in every single year of the Turkish labor market (see Figure 2.1 and Figure A.3), in other words, unemployment exists. This is not so unusual in labor markets. Important point here is the extent and characteristics of unemployment.

Figure 2.1 Employment and Labor Force Participation Rates (1988-2013)

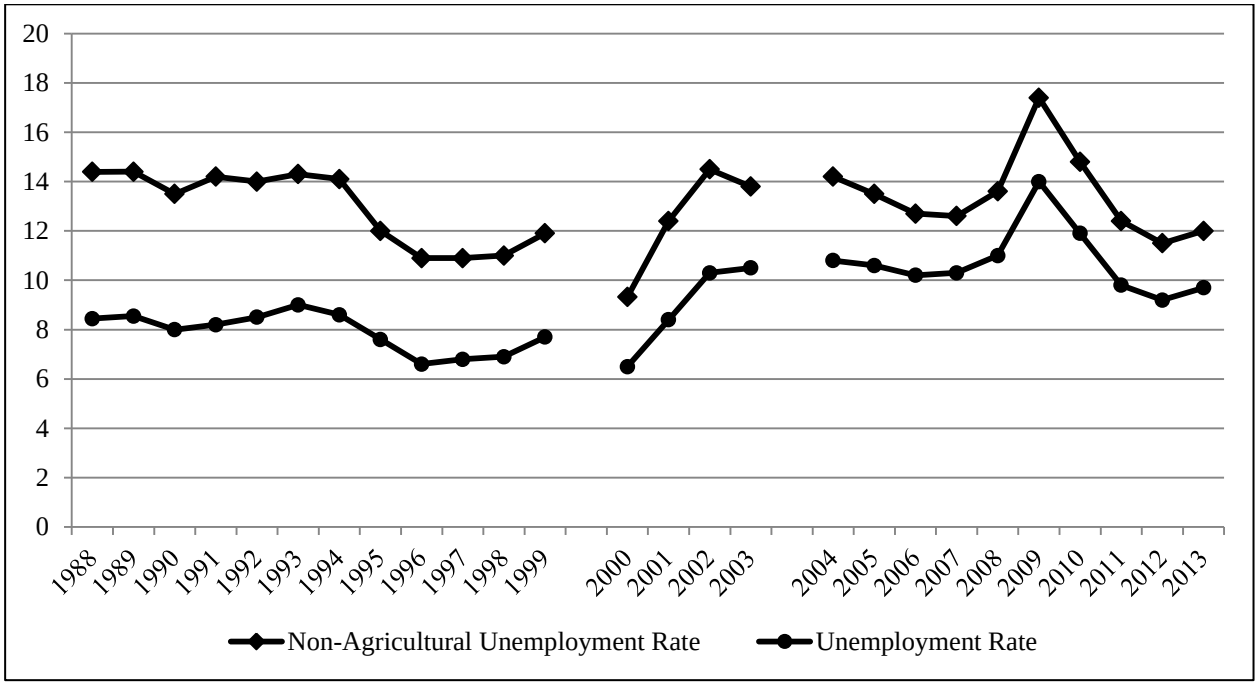


Source: TurkStat (2014a)

The preceding discussion leads us to examine another major indicator of the labor market, namely unemployment rate. The share of unemployed individuals in the Turkish labor force fluctuates around 8% in 1990s. Unemployment rate reaches to 9% in 1994 crisis. After 2001 crisis, unemployment rate settle into a new plateau with 10% in average. It even increases to 14% in the last 2008-2009 economic crisis (see Figure 2.2). So, in the long-run there is an increasing trend in the unemployment rates (see Figure 2.3). Non-agricultural unemployment rate is also calculated to truly understand the extent of unemployment in the labor market. This is due to idiosyncratic characteristics of the agricultural sector in the Turkey. The unpaid family workers are so common in the agriculture. So, the unemployment rate of non-agricultural sectors is a more accurate measure to grasp the real extent of joblessness in the labor market. Non-agricultural unemployment rates always surpass the unemployment rate in the Turkish labor market (see Figure 2.2 and Figure A.4). This difference manifests itself notably in years of economic crises. In 1990s, the average non-agricultural unemployment rate is around 13%. This does not change too much at the beginning of 2000s, even it increases with

2001 crisis. This rate reaches its maximum 17.4% in 2009 with the effect of the 2008-2009 crisis (see Figure 2.2).

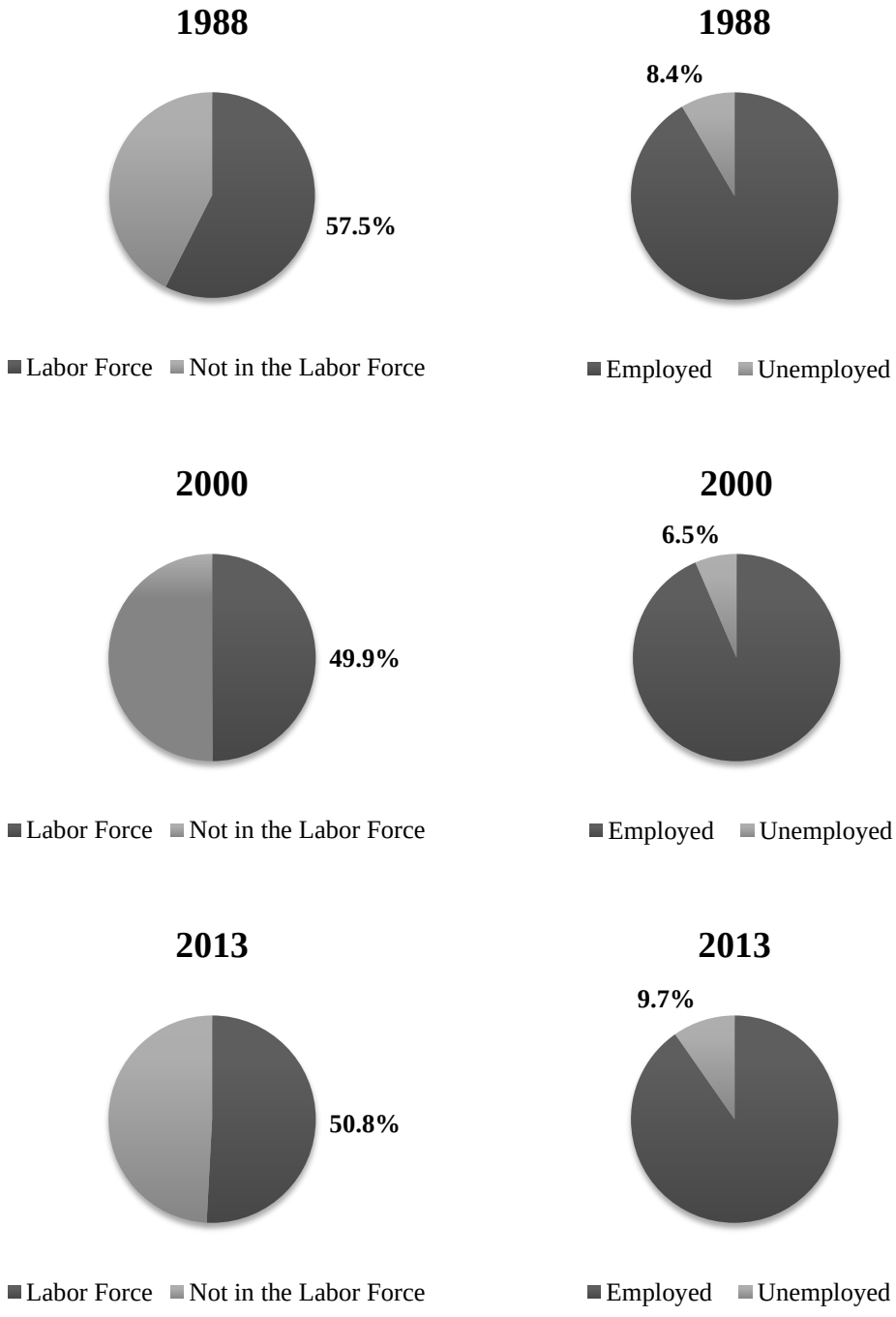
Figure 2.2 Unemployment and Non-Agricultural Unemployment Rates (1988-2013)



Source: TurkStat (2014a)

To sum up, the labor market indicators of Turkey show that there is an increasing trend for unemployment rates and there is a decreasing trend for labor force participation and employment rates in the long-run. Given abovementioned labor market policies following the neoliberal agenda since 1980s, it is not possible to conclude that these policies have created additional employment opportunities for labor; instead they resulted in volatile patterns for most of the indicators. Even worse, these statistics are just reflecting the characteristics of the labor market quantitatively. Qualitative characteristics of the Turkish labor market are parallel with these deteriorating statistics. Although the aim of this dissertation does not directly and empirically cover to describe these worsening conditions of the labor market, the implications of high labor demand elasticities in consequence of globalization give clues about the vulnerabilities of labor in terms of higher employment volatility and lower bargaining power for workers. Next subchapter summarizes the extent of integration with the world economy and completes the descriptive background.

Figure 2.3 Labor Force Participation and Unemployment Rates (1988-2000-2013)



Source: TurkStat (2014a)

Table 2.1.a Labor Market Indicators in Turkey by Gender (1988-2000-2013)

	Total			Male			Female		
Selected Years	**1988***	**2000**	**2013**	**1988***	**2000**	**2013**	**1988***	**2000**	**2013**
Non-institutional civilian population (000)	53.284	66.187	74.457	26.648	33.058	37.026	26.636	33.129	37.430
Population 15 years old and over (000)	33.746	46.211	55.608	16.661	22.916	27.411	17.085	23.295	28.197
Labor force (000)	19.391	23.078	28.271	13.536	16.890	19.597	5.855	6.188	8.674
Employed (000)	17.755	21.581	25.524	12.520	15.780	17.883	5.235	5.801	7.641
Unemployed (000)	1.638	1.497	2.747	1.017	1.111	1.714	621	387	1.033
Labor force participation rate (%)	57,5	49,9	50,8	81,2	73,7	71,5	34,3	26,6	30,8
Employment rate (%)	52,6	46,7	45,9	75,1	68,9	65,2	30,6	24,9	27,1
Unemployment rate (%)	8,4	6,5	9,7	7,5	6,6	8,7	10,6	6,3	11,9
Non-agricultural unemployment rate (%)	14,4	9,3	12,0	10,7	8,4	10,1	33,4	13,5	17,4
Youth unemployment rate [(1)](%)	17,5	13,1	18,7	17,2	13,7	17,0	17,9	11,9	21,9
Not in the labor force (000)	14.355	23.133	27.337	3.125	6.025	7.814	11.230	17.108	19.523
Source: TurkStat (2014a)									
**1988 is from the October round of HLFS. (1) Population within 15-24 age group*									

Table 2.1.b Labor Market Indicators in Turkey by Rural-Urban Locations (1988-2000-2013)

	Total			Rural			Urban		
Selected Years	**1988***	**2000**	**2013**	**1988***	**2000**	**2013**	**1988***	**2000**	**2013**
Non-institutional civilian population (000)	53.284	66.187	74.457	26.803	27.272	23.572	26.481	38.915	50.885
Population 15 years old and over (000)	33.746	46.211	55.608	16.509	18.581	17.479	17.237	27.630	38.129
Labor force (000)	19.391	23.078	28.271	11.068	10.902	9.364	8.324	12.176	18.907
Employed (000)	17.755	21.581	25.524	10.519	10.477	8.788	7.235	11.104	16.736
Unemployed (000)	1.638	1.497	2.747	549	425	576	1.088	1.072	2.171
Labor force participation rate (%)	57,5	49,9	50,8	67,0	58,7	53,6	48,3	44,1	49,6
Employment rate (%)	52,6	46,7	45,9	63,7	56,4	50,3	42,0	40,2	43,9
Unemployment rate (%)	8,4	6,5	9,7	5,0	3,9	6,1	13,1	8,8	11,5
Non-agricultural unemployment rate (%)	14,4	9,3	12,0	16,1	10,2	12,9	13,7	9,0	11,8
Youth unemployment rate [(1)](%)	17,5	13,1	18,7	11,0	8,4	13,7	27,1	17,7	21,2
Not in the labor force (000)	14.355	23.133	27.337	5.441	7.679	8.115	8.913	15.454	19.222
Source: TurkStat (2014a)									
**1988 is from the October round of HLFS. (1) Population within 15-24 age group*									

2.2. International Trade Policies and International Trade Performance

In this second subchapter, changes in the international trade policies of Turkey are tried to be linked with the foreign trade performance. The regulations on international trade such as tariffs and agreements with other countries determine the easiness while making trade. These regulations and other macroeconomic developments related with them are discussed together during this part of the chapter. Again the recent historical critical turning points of the Turkish economy are considered as they determined the context of policies in effect for the last three decades.

2.2.1. International Trade Policies

As it is mentioned during the previous parts of this chapter, Turkey has implemented the economic and trade policies of import-substituting industrialization strategy under strict state protection until 1980s. Although these policies resulted with positive economic growth rates in various years of 1960s and 1970s, import substitution strategy lead to the problems such as firm level inefficiencies, macroeconomic instabilities, high unemployment and inflation rates, and severe balance of payments problems (Şenses, 1994). These problems have become unsustainable at the end of the 1970s and resulted with foreign exchange crises. The deficits of the public sector and the shortages in imports contributed to high inflation rates which were 69% in average during 1978-80. As a consequence of all these problems, the growth rates of manufacturing sector reduced and even dropped to negatives during 1978-80.

Trade openness is one of the major policy components of the structural adjustment reform program launched at the beginnings of 1980. This trade liberalization period is analyzed under two distinct sub-periods by economists (Yeldan, 2000; Taymaz and Yilmaz, 2007). Accordingly, in the first period between 1981 and 1988, structural adjustments were maintained with export promotions and trade liberalization of commodities under a managed foreign exchange system. The second period started in 1989 with the abandonment of controls over foreign capital transactions and the announcement of the Turkish Lira's convertibility. This second period witnessed important policy changes in the trade regime. One of them was the membership to the

World Trade Organization (WTO) in 1995 and the second one was the involvement to the Customs Union (CU) in January 1996. The other ones were Free Trade Agreements (FTA) signed with the European Free Trade Association countries, Israel, and the Central and Eastern European countries (2001).[24] The outcomes of these changes in trade policy were simply substantial increases in the volumes of exports and imports (see Section 2.2.2 and see Table 2.2).

In this part of the chapter, considering again the macroeconomic developments, the policy shifts and their results for the international trade are analyzed considering again the critical historical turning points during the recent decades of the Turkish economy.

2.2.1.1. The Post-1980 Period: Trade Liberalization and Exports

The foreign exchange crisis of late 1970s accompanied by civil unrest and political instabilities ended with an orthodox stabilization package (1980) and a military regime (1980-83). In January 24, 1980, government announced an orthodox stabilization and liberalization program, which is then named as 24 January decisions. This standard stabilization program was then transformed into a structural adjustment program to reorient the economic structure towards an export-led growth path under the auspices of the international centers such as the International Monetary Fund (IMF) and the World Bank (WB). The military coup of September 1980 constituted the political background of this program and supported all economic policies linked to this program. Main targets of that decisions were to stabilize the economy first by healing the balance of payment problems through export growth and by decreasing the inflation rates in the short-run and to create an economy which is adopted to the free market mechanisms and head towards an open economy switching from inward-oriented industrialization to an outward-oriented industrialization strategy, especially to increase the international trade performance, increasing the volumes of exports in the long-run.[25]

[24] The full list of countries which Turkey signed Free Trade Agreements (FTA) is: Iceland, Norway, Switzerland, Lichtenstein, Georgia, Israel, Macedonia, Bosnia-Herzegovina, Tunisia, Morocco, Palestine, Syria, Egypt, Albania, Montenegro, Serbia, Chile, Jordan, Mauritius, South Korea (The Republic of Turkey Prime Ministry Investment Support and Promotion Agency, 2014).

[25] The rate of inflation which had almost reached three digit figures in 1980 was reduced to an average of 33.2% in the following two years (Boratav and Yeldan, 2006).

To do this, government aimed to transform the economic policies from an inward-oriented and interventionist structure to the more market-adopted mechanisms and outward-oriented ones. Some measures were announced with this new program. Tight fiscal and monetary policies are incorporated with program. Against the balance of payments problems, a huge devaluation was made and the value of Turkish lira (TL) was decreased from 47 lira to 70 lira over against dollar to make Turkish exports more competitive. Until 1980, the exchange rate system was fixed with multiple rates. From January 1980 to May 1981, the nominal exchange rate was adjusted at irregular intervals. After May 1981, exchange rates were started to be determined daily by the Central Bank of the Republic of Turkey (CBRT), in a managed floating setting. The government's policy to support exporters via depreciating the exchange rate more or less was maintained until 1988 to ensure that the TL provides its external competitiveness. TL was depreciated by 55% in real terms between the end of 1970s and the end of 1988. Besides, the exchange rate was used as the main stabilization instrument not only for restraining domestic demand, but also shifting both consumption and production away from non-tradables to tradables.

Reforms also consisted of price and interest rate deregulations. Moreover, various tax supports and other subsidies were given. So exports were promoted to lead the promotion of export-led growth.[26] Import liberalization was also gradually carried by removing import quotas and custom duties, and so constituted the background of trade liberalization in 1984 (which culminated in a Customs Union with EU in 1996).[27] This import liberalization program eliminated quantity restrictions (60 percent of 1983 imports were liberalized) and tariffs for the majority of imports were reduced by 20 percent (Baysan and Blitzer, 1990). Price controls were removed in domestic markets, which eliminated the painful shortages in basic commodities, and the prices of products of State Economic Enterprises were increased to fix the public finance. Public subsidies in various spheres of economy were removed. One of the most prominent measures was to decrease the incomes of agricultural producers and to depress the real wages of paid

[26] For the details of export incentive schemes, see CBRT (2002).

[27] The foreign exchange regime was also liberalized in 1984. Banks were allowed to accept foreign currency and to engage in transactions with foreign currency.

workers.[28] The rationales behind these adjustments were both to establish the fiscal balances and to gain competitive power in international markets. By suppressing the wages, production costs were lowered and the domestic absorption capacity was squeezed. These initial moves also provided to regain the confidence of international creditors. The IMF stand-by and WB adjustment loans were arranged and disbursed with additional debt relief operations. These net foreign lending opportunities allowed to continue for the intermediate goods' imports and eased pressures on public finance.

This export-led growth strategy adopted was quite successful in terms of economic growth and inflation in the very short-run. The average annual growth rate of the gross domestic product (GDP) was 5.8 percent between 1981 and 1988.[29] The inflation rate was also reduced from 86.9% in 1980 to 26.0% in 1983.[30]

However, the most important outcome of these new policies in 1980s was the increase in exports. The share of exports in GNP increased from 4.2% in 1980 to 9.2% in 1983. During 1983-87 export revenues increased at an annual rate of 10.8%, and gross domestic product (GDP) rose at an annual rate of 6.5%. Export revenues were 2.3 billion dollar in 1979 and the share in GDP was 2.6 percent. In 1985, export revenues increased to 8 billion dollar and it increased to 13 billion dollar in 1990 (the share in GDP was 8.6 percent). The share of manufactured goods in exports of developing countries increased with the effect of globalization process in 1980s. The composition of exports also changed in Turkey and shifted from agricultural products to industrial products. In that decade, Turkey was one of the countries with the highest increase in its exports among developing countries. 80 percent of the export increase was sourced from manufactured goods. Turkish manufacturing witnessed a rapid growth in exports and imports after 1980. The share of manufactured goods in total exports was 36 percent in 1979 and it increased to 80 percent in 1990, to 88 percent in 1995. Textile, garments and iron-steel were the major exported goods. The gradual import liberalization also resulted with the increase of imports from 7.9 billion dollars in 1980 to 15.8 billion dollars in 1989. Therefore, the share of foreign trade in GNP increased in that period. The average

[28] The share of wage-labor in manufacturing value added declined from an average of 35.6% in 1977-80, to 20.6% in 1988 (Boratav and Yeldan, 2006).
[29] Despite the restrictive internal demand management, GDP rose at annual rate of 4.2% in 1981-82, and 6.5% between 1983 and 1987.
[30] But after the general elections and a new parliament in 1984, the inflation started to rise again (Ertuğrul and Selçuk, 2001).

share of exports in GNP increased threefold and the share of imports doubled. These developments lead to the improvements in the external imbalance and first decreased the share of current account deficit in GNP from almost 6 percent in 1980 to 1.7 percent in 1982. However, these short-run improvements in the external balance have not been sustainable almost in any subsequent period of the Turkish economy.

2.2.1.2. The Post-2000 Period: Economic Policies of AKP

Turkey experienced a severe economic crisis in November 2000 and again in February 2001. When the crisis exploded, Turkey was following an exchange-rate based disinflation program led and formulated by the IMF. In 2001, real GDP contracted by 5.7%, inflation increased to 61.6% and the Turkish lira lost its value against dollar and major currencies by 51%. The burden of crisis felt on the labor class as the unemployment rate rose steadily by 2 percentage points in 2001 and then another 2 percentage points in 2002. Real wages felt by 20%.

In a nutshell, from the Second World War until 2001 economic crisis, Turkey's catching up process with the developed countries was fragile and volatile. Although, some steps towards reforms and liberalization are taken in the 1980s, inadequately designed macroeconomic policies and weak institutional and regulatory environment before financial liberalization lead to the recurrent economic crises.

After the 2001 crisis, Turkey has implemented an orthodox strategy by raising interest rates and maintaining an overvalued exchange rate. The government was forced to implement a contractionary fiscal policy, and promised to satisfy the conventional IMF policies: reduction of subsidies in agriculture, privatizations and reductions the role of public sector in economic activities. Turkey has revamped its political and economic institutions and economic policies after that crisis. Then macroeconomic stability, bold structural reforms and rapid economic growth followed during 2002-2007. Real GDP growth surged from an average of 3.9% in the 1990s to 7.2% between 2002 and 2006.[31]

The post-crisis (2001) economic and political adjustments were conducted by the newly founded Justice and Development Party (AKP) which came to the power after

[31] For an appraisal of the recent economic performance, see Akat and Yazgan (2013). For a long-term account of the sources of the Turkish economic growth, see Altuğ, Filiztekin and Pamuk (2008) and İsmihan and Metin-Özcan (2005).

November 2002 elections and enjoyed absolute majority in the parliament up to today (2014). After taking office, AKP totally adopted neoliberal policies. Coincidence with a worldwide financial expansion in that period eased to find sources to finance the economy for the AKP governments. Especially successful management of the economy between 2002 and 2007 has created a positive perception in favor of the AKP power. Overvalued TL, high purchasing power of consumers and high economic growth rates are the main elements behind this positive perception. Structural reforms and practices of settled macroeconomics management after 2001 crisis also contributed to that success. However, liquidity abundance in the world economy in that period helped to expand the public expenditures in this reform process without exposing serious liquidity constraint. Especially low interest payments of the public sector created additional sources to increase public expenditures. Expenditures of private sector also increased during the term. By decreasing inflation rates and abundance of foreign currency made the TL overvalued which leaded to increase in imports. In this environment of trust to the AKP governments, postponed investments gained speed and so total factor productivity increased. Current account deficits originated from increasing expenditures and debts were financed by the facilities of expanded international liquidity. Although foreign debts increased during the term, inflation and interest rates were decreased. These developments lead to improvement of perceptions about wealth depending on the consumption behavior. Therefore AKP governments found wide support in successive elections. However, after the global financial crisis (after 2008-2009 period), negative economic circumstances created suspicions about the sustainability of this economic growth and development model and reversed the positive perceptions.[32]

After 2008-09 economic crises, investment behaviors and the climate changed in the Turkish economy. Especially, the replacement investments made in the manufacturing sector between 2002 and 2007 were not supported with new investments to increase the production capacity. Therefore, in the last term investment expenditures decreased. The instabilities experienced after 2007 may also be sources in that negative pattern of investments. Far worse than this, some deteriorations in the relative price structure of the economy occurred. Liquidity abundance and the resulting overvalued

[32] For the interpretation of this split in terms of AKP governments' economic performance, see Gürkaynak and Sayek-Böke (2013). Besides, for the policy response of AKP to the 2008-09 crises, see Aydın (2012).

TL policy increased the intensity of economic activities in some non-tradable sectors such as construction, banking and retail trade, and increased prices due to vitality in these sectors distorted allocation of resources in the economy. Some industrialists shifted their investments into the construction sector. Therefore, fiscal resources used in these sectors damped the potential of creating foreign currency. However, parallel with the policy changes of FED, the international liquidity is not abundant and cheap in recent years. These developments in the international capital flows are expected to contract the domestic demand and so further contractions in the economic growth.

2.2.2. International Trade Performance in the Post-1980 Period

The annual foreign trade statistics of the TurkStat is one of the series which have continuous data without any gap since 1923.[33] According to this time series data of international trade, the exports volume reached to about 152 billion dollars, the imports volume is about 252 billion dollars, and so the total trade volume reached a peak with 403.5 billion dollars by 2013 in monetary terms (see Table 2.2). There are persistently increasing trends both in exports and imports volumes, particularly after the trade liberalization act in 1980. However, the growth of imports is usually higher than the growth of export excluding the years with economic crises. Therefore, the balance of foreign trade is always negative since 1980 (see Figure 2.4 and Table 2.2). Thus, it is not so straightforward to assess the international trade performance of the Turkish economy. Each period in the last three decades has its own characteristics in terms of trade policies. For sure, these policies are not independent from the implications of political and macroeconomic developments described in previous parts. Moreover, the assessment of international trade statistics just considering the nominal trade volumes does not give us economically significant adequate information about the performance. The characteristics of trade partners and the composition of traded products are also influential not only to understand the direction of trade policies but also to grasp an idea about the industrial policies. At the end, policies regarding trade and industry are so closely related.

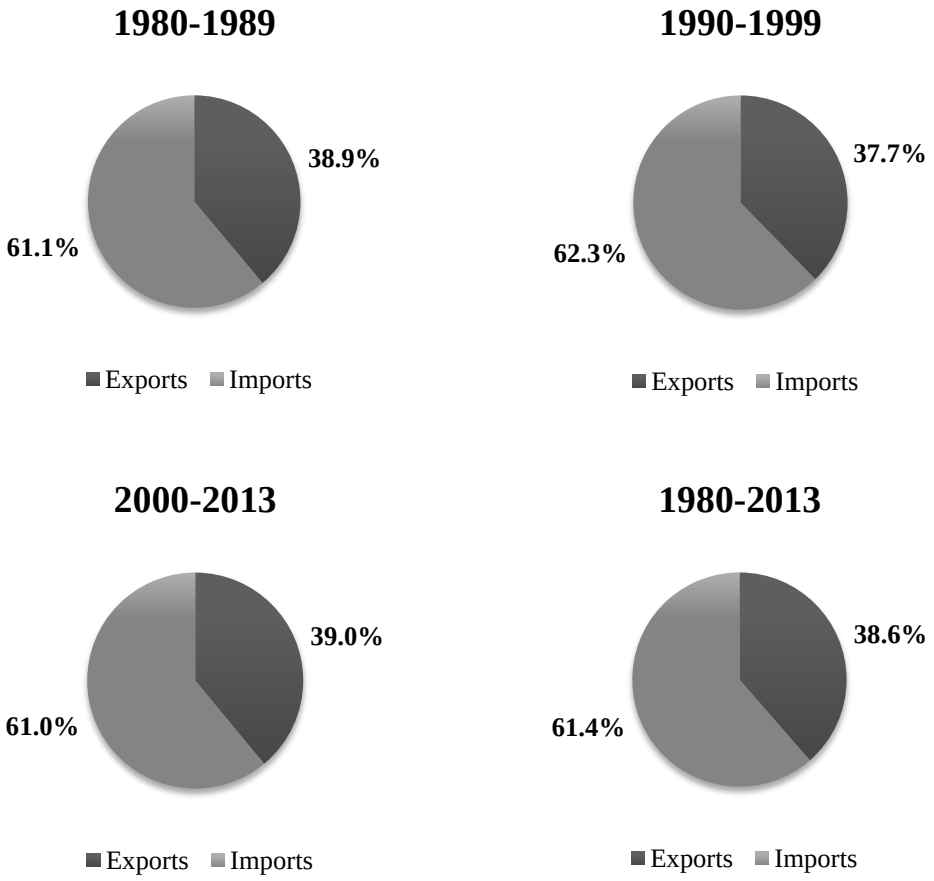
[33] Monthly data for foreign trade statistics exists since 1997 (TurkStat, 2014b).

Table 2.2 International Trade Indicators in Turkey (1980-2013)

Years	Exports (Thousand $)	Imports (Thousand $)	Trade Balance (Thousand $)	Total Trade Volume (Thousand $)	Proportion of Imports Covered by Exports (%)
1980	2 910 122	7 909 364	-4 999 242	10 819 486	36.8
1981	4 702 934	8 933 374	-4 230 439	13 636 308	52.6
1982	5 745 973	8 842 665	-3 096 692	14 588 639	65.0
1983	5 727 834	9 235 002	-3 507 168	14 962 836	62.0
1984	7 133 604	10 757 032	-3 623 429	17 890 636	66.3
1985	7 958 010	11 343 376	-3 385 367	19 301 386	70.2
1986	7 456 726	11 104 771	-3 648 046	18 561 497	67.1
1987	10 190 049	14 157 807	-3 967 757	24 347 856	72.0
1988	11 662 024	14 335 398	-2 673 374	25 997 422	81.4
1989	11 624 692	15 792 143	-4 167 451	27 416 835	73.6
1990	12 959 288	22 302 126	-9 342 838	35 261 413	58.1
1991	13 593 462	21 047 014	-7 453 552	34 640 476	64.6
1992	14 714 629	22 871 055	-8 156 426	37 585 684	64.3
1993	15 345 067	29 428 370	-14 083 303	44 773 436	52.1
1994	*18 105 872*	*23 270 019*	*-5 164 147*	*41 375 891*	*77.8*
1995	21 637 041	35 709 011	-14 071 970	57 346 052	60.6
1996	23 224 465	43 626 642	-20 402 178	66 851 107	53.2
1997	26 261 072	48 558 721	-22 297 649	74 819 792	54.1
1998	26 973 952	45 921 392	-18 947 440	72 895 344	58.7
1999	*26 587 225*	*40 671 272*	*-14 084 047*	*67 258 497*	*65.4*
2000	27 774 906	54 502 821	-26 727 914	82 277 727	51.0
2001	*31 334 216*	*41 399 083*	*-10 064 867*	*72 733 299*	*75.7*
2002	36 059 089	51 553 797	-15 494 708	87 612 886	69.9
2003	47 252 836	69 339 692	-22 086 856	116 592 528	68.1
2004	63 167 153	97 539 766	-34 372 613	160 706 919	64.8
2005	73 476 408	116 774 151	-43 297 743	190 250 559	62.9
2006	85 534 676	139 576 174	-54 041 498	225 110 850	61.3
2007	107 271 750	170 062 715	-62 790 965	277 334 464	63.1
2008	132 027 196	201 963 574	-69 936 378	333 990 770	65.4
2009	*102 142 613*	*140 928 421*	*-38 785 809*	*243 071 034*	*72.5*
2010	113 883 219	185 544 332	-71 661 113	299 427 551	61.4
2011	134 906 869	240 841 676	-105 934 807	375 748 545	56.0
2012	152 461 737	236 545 141	-84 083 404	389 006 877	64.5
2013	151 802 637	251 661 250	-99 858 613	403 463 887	60.3

Source: TurkStat (2014b)

Figure 2.4 Average Shares of Exports and Imports in Total Trade (1980-2013)



Source: TurkStat (2014b)

As it is frequently mentioned above, after the balance of payments crisis in late 1970s, Turkey liberalized its trade regime in 1980. The direct consequences of this policy shift reflected into the trade volumes in terms of increasing volumes for exports and imports. Particularly, exports increased by almost 10 billion dollars in 10 years, reached to about 13 billion dollars by 1990, from 3 billion dollars in 1980. In the same period, imports increased from 8 billion dollars to 22 billion dollars (see Table 2.2). However, the acceleration of the increase in trade volumes slowed down in 1990s. The share of exports in total trade decreased in 1990s (see Figure 2.4). Especially, due to external shocks such as Gulf War in 1991 and Russian financial crisis in 1998 and due to an internal economic crisis and an earthquake disastrous of Turkey in 1994 and in 1999, imports were cut in some periods during this decade.

The last decade, 2000s, are very striking in terms of international trade. Except the two major economic crises years, in 2001 and in 2009, both exports and imports volumes expanded permanently and they exceed 100 billion dollars, even imports have reached to around 250 billion dollars (see Figure A.5). Exports are quadrupled and imports increased by three-and-a-half times between 2000 and 2010. But unfortunately, trade deficits reached to outstanding levels, such as it exceeds 100 billion dollars in 2011. In other words, the trend for the proportion of imports covered by exports could not improve in that period. The average of this proportion is 64.7 percent in 1980s, 60.9 percent in 1990s and 64.1 percent in 2000s (see Table 2.2).

Turkey makes trade with about 220 countries in terms of exports and imports. European Union countries constitute the largest portion among all trade counterparts of Turkey. However, there is a declining trend with EU trade in the last decade (2004-2013). The share of exports with EU-28 countries decreased from 58.1% in 2004 to 41.5% in 2013 and the share of imports with EU-28 decreased from 49.3% in 2004 to 36.7% in 2013 (see Table 2.3.a and Table 2.3.b). So, the share of exports and imports with other countries has increased over time (see Figure 2.5). Particularly, there is an increasing trend of international trade with Near and Middle Eastern countries, both in exports and in imports. The share of exports with the Near and Middle Eastern countries have expanded from 12.5 percent in 2004 to 23.4 percent in 2013 (see Figure 2.5 and Table 2.3.a). The share of imports with the Near and Middle Eastern countries increased also from 4.4 percent in 2004 to 8.8 percent in 2013 (see Table 2.3.b). Besides, there is an increase in trade activities with African countries. About 10 percent of exports go to the African countries in 2013 (see Table 2.3.a). Moreover, the role of Asian countries in imports has increased during this last decade. The share of imports from Asian countries has expanded from 15.9 percent in 2004 to 21.7 percent in 2013 (see Figure 2.5 and Table 2.3.b). Due to these changing trends in trade with different country groups in the last decade, there are inconclusive debates about the geographical shift of international trade in Turkey.

Table 2.3.a Exports by Country Group, Share in Total (%) (2004-2013)

Country Groups	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
European Union (EU 28)	**41.5**	**39.0**	**46.4**	**46.5**	**46.2**	**48.3**	**56.6**	**56.3**	**56.5**	**58.1**
Free Zones in Turkey	**1.6**	**1.5**	**1.9**	**1.8**	**1.9**	**2.3**	**2.7**	**3.5**	**4.0**	**4.1**
Other countries	**56.9**	**59.5**	**51.7**	**51.7**	**51.8**	**49.5**	**40.6**	**40.2**	**39.4**	**37.8**
Other European Countries	*9.4*	*9.3*	*9.4*	*9.8*	*10.9*	*11.6*	*9.8*	*9.1*	*7.7*	*6.9*
North African Countries	*6.6*	*6.2*	*5.0*	*6.2*	*7.3*	*4.4*	*3.8*	*3.6*	*3.5*	*3.5*
Other African Countries	*2.7*	*2.6*	*2.7*	*2.0*	*2.7*	*2.4*	*1.8*	*1.7*	*1.5*	*1.2*
North American Countries	*4.3*	*4.4*	*4.0*	*3.7*	*3.5*	*3.6*	*4.2*	*6.4*	*7.2*	*8.2*
Central America and Caribbean	*0.7*	*0.5*	*0.5*	*0.5*	*0.6*	*0.6*	*0.5*	*0.6*	*0.6*	*0.5*
South American Countries	*1.4*	*1.4*	*1.4*	*1.1*	*0.7*	*0.7*	*0.5*	*0.4*	*0.4*	*0.3*
Near and Middle Eastern	***23.4***	***27.8***	***20.7***	***20.5***	***18.8***	***19.3***	***14.1***	***13.2***	***13.9***	***12.5***
Other Asian Countries	*7.9*	*6.9*	*7.6*	*7.5*	*6.6*	*5.4*	*4.9*	*4.6*	*4.1*	*4.0*
Australia and New Zealand	*0.4*	*0.3*	*0.4*	*0.4*	*0.4*	*0.3*	*0.3*	*0.4*	*0.4*	*0.4*
Other Countries	*0.1*	*0.1*	*0.1*	*0.1*	*0.5*	*1.1*	*0.8*	*0.2*	*0.3*	*0.1*
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

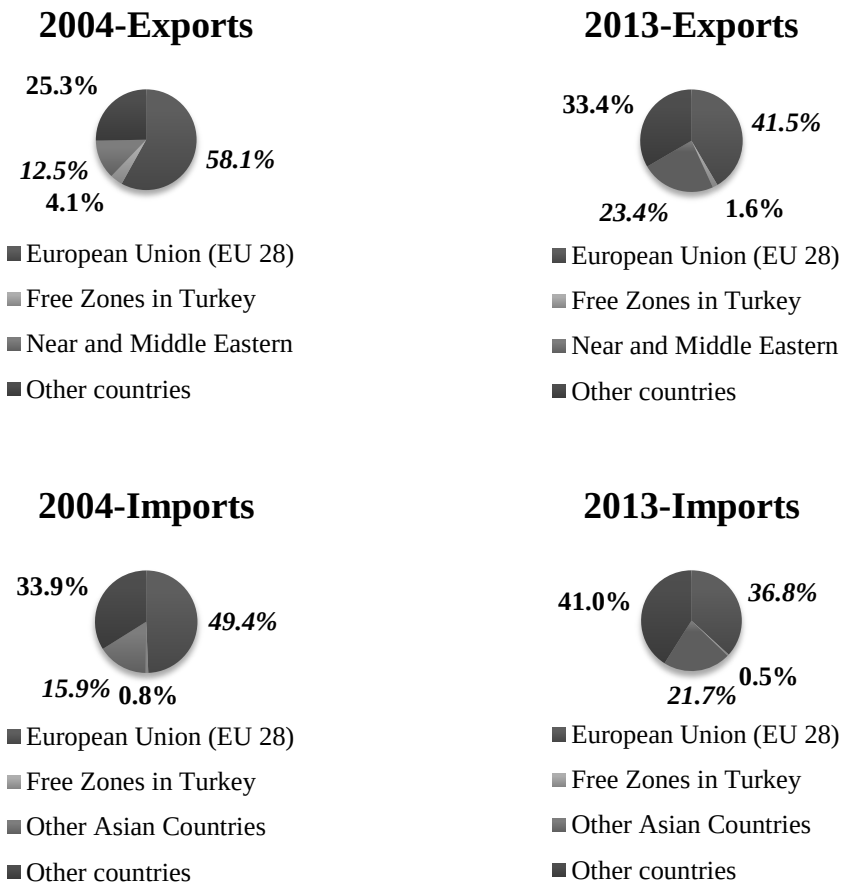
Source: TurkStat (2014b)

Table 2.3.b Imports by Country Group, Share in Total (%) (2004-2013)

Country Groups	**2013**	**2012**	**2011**	**2010**	**2009**	**2008**	**2007**	**2006**	**2005**	**2004**
European Union (EU 28)	**36.7**	**37.1**	**38.0**	**39.0**	**40.2**	**36.9**	**40.3**	**42.6**	**45.2**	**49.3**
Free Zones in Turkey	**0.5**	**0.4**	**0.4**	**0.5**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.8**
Other countries	**62.8**	**62.5**	**61.6**	**60.5**	**59.1**	**62.4**	**59.0**	**56.7**	**54.1**	**49.8**
Other European Countries	*16.4*	*15.7*	*14.8*	*16.2*	*18.3*	*21.8*	*20.1*	*18.4*	*17.4*	*16.1*
North African Countries	*1.4*	*1.4*	*1.4*	*1.7*	*1.6*	*1.8*	*1.3*	*1.2*	*1.4*	*1.2*
Other African Countries	*1.0*	*1.1*	*1.4*	*0.9*	*1.2*	*1.0*	*1.7*	*1.6*	*1.4*	*1.5*
North American Countries	*5.5*	*6.4*	*7.2*	*7.1*	*6.8*	*6.6*	*5.3*	*5.0*	*5.0*	*5.2*
Central America and Caribbean	*0.5*	*0.5*	*0.4*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*
South American Countries	*1.5*	*1.7*	*1.9*	*1.6*	*1.6*	*1.6*	*1.6*	*1.5*	*1.5*	*1.3*
Near and Middle Eastern	*8.8*	*9.1*	*8.5*	*7.0*	*5.1*	*6.5*	*6.0*	*6.2*	*5.2*	*4.4*
Other Asian Countries	***21.7***	***21.0***	***22.1***	***21.7***	***20.4***	***18.6***	***19.8***	***18.4***	***17.6***	***15.9***
Australia and New Zealand	*0.5*	*0.4*	*0.3*	*0.3*	*0.5*	*0.4*	*0.4*	*0.3*	*0.3*	*0.3*
Other Countries	*5.3*	*5.3*	*3.6*	*3.6*	*3.4*	*3.7*	*2.6*	*4.0*	*4.2*	*3.7*
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: TurkStat (2014b)

Figure 2.5 Exports and Imports Share by Country Groups (2004-2013)



Source: TurkStat (2014b)

Another important issue for the international trade performance of Turkey is about the composition of exports and imports. Particularly, after the involvement into the Customs Union in 1996, the composition of exports have shifted more heavily to the sectors with higher technologies such as electrical and electronic machinery and equipment as well as automotive industry from labor-intensive lower-skilled sectors such as textiles and clothing, iron and steel.[34] On the import side, the share of imported intermediate inputs in total imports has an increasing trend over time, and reached to about 70 percentages (see Table 2.4.b). Even worse, the largest portion among imported

[34] 57 percent of exports are made by the establishments in the industry as of 2013, and moreover, 36.2 percent of exports are made by the establishments which have 250 or more employees in the industry (TurkStat, 2014b).

intermediate inputs belongs to the processed materials incidental to industry; it is about 44 percent in 2013.[35]

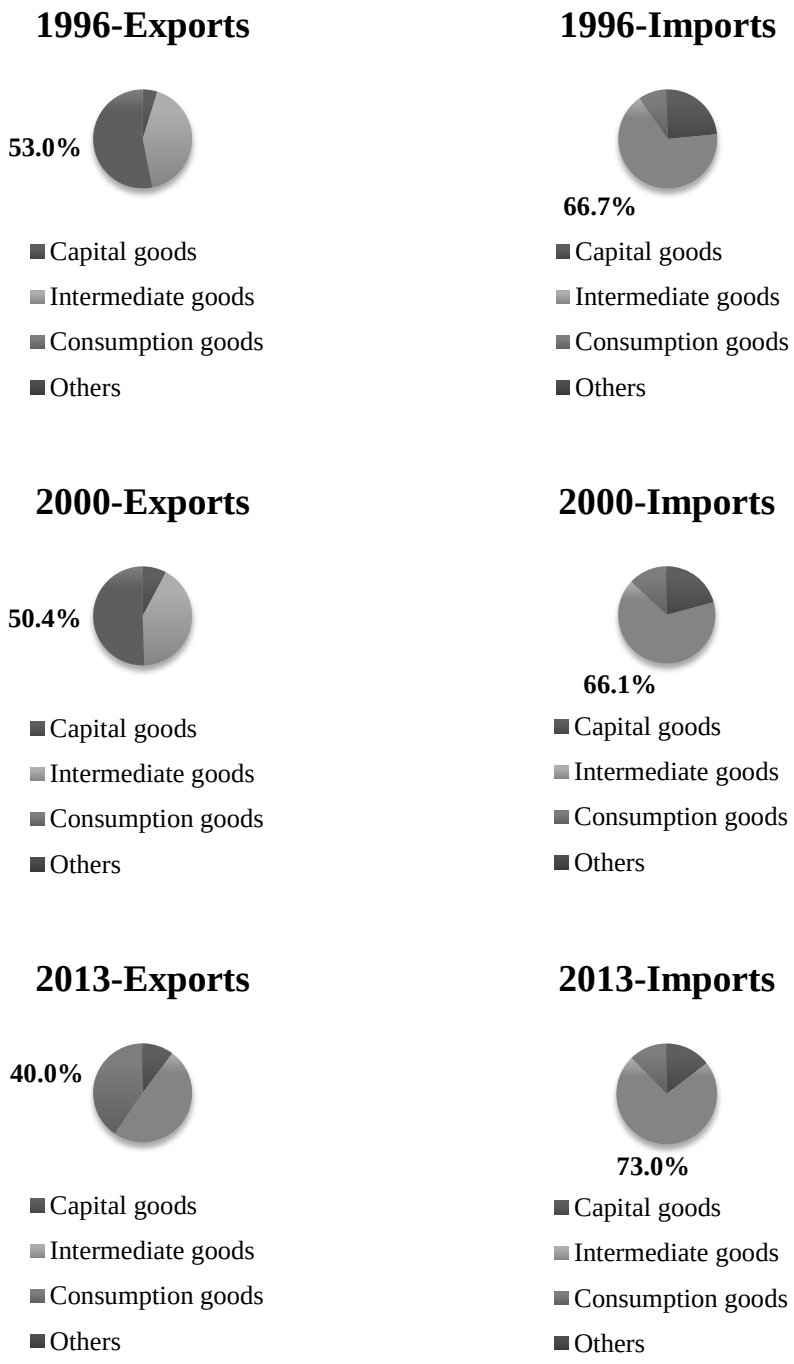
According to the Broad Economic Categories (BEC), the share of consumption goods in total exports has a decreasing trend since 1996, it decreased from 53 percent in 1996 to 40 percent in 2013 (see Figure 2.6 and Table 2.4.a). However, the share of intermediate goods in total exports has increased from 42.1 percent in 1996 to 49.3 percent in 2013 (see Table 2.4.a). The share of capital goods in total exports has also an increasing trend over time. It increased from 4.8 percent in 1996 to 10.3 percent in 2013 (see Table 2.4.a). On the other hand, the intermediate goods constitute the largest portion among imported goods. Its share is around 70 percent in average between 1996 and 2013 (see Figure 2.6 and Table 2.4.b). The share of imported consumption goods also has an increasing trend over time. It increased from 9.2 percent in 1996 to 12.1 percent in 2013 (see Table 2.4.b). However, the share of capital goods among imported goods is decreasing during the last two decades. It is decreasing from 23.5 percent in 1996 to 14.6 percent in 2013 (see Table 2.4.b).

The last indicator for our descriptive analysis of international trade is the share of manufacturing sector in total trade. According to the International Standard Industrial Classification (ISIC) Rev.3, the exports and imports of the manufacturing sector are given in Table 2.5. Accordingly, the share of manufacturing sector in total exports is persistently increasing in the last two decades. It is increasing from 88.4 percent in 1996 to 93.1 percent in 2013 (see Figure 2.7 and Table 2.5.). However, the share of manufacturing sector in total imports is constant over time. In average, it is around 80 percent of total imports (see Figure 2.7 and Table 2.5).

Overall, the mixed evidences from the stylized facts and from the earlier studies on the performance of the Turkish economy in the post-1980 liberal era features the importance of quantitatively analyzing the determinants of labor demand considering the changes in trends and in contents of international trade over time. Before starting to empirical analyses which are fed from all these observations on the raw data, the background of the labor demand theory is presented in the next chapter.

[35] The import share of establishments in the industry is 51.2 percent in 2013, and the share of import volume of establishments in the industry which have 250 or more employees is 37.7 percent (TurkStat, 2014b).

Figure 2.6 Exports and Imports by BEC (1996-2000-2013)



Source: TurkStat (2014b)

Table 2.4.a Exports by Broad Economic Categories (BEC) (1996-2013)

Years	Total Exports (Thousand $)	Capital Goods (Thousand $)	Share of Capital Goods (%)	Intermediate Goods (Thousand $)	Share of Intermediate Goods (%)	Consumption Goods (Thousand $)	Share of Consumption Goods (%)	Others (Thousand $)	Share of Others (%)
1996	23224465	1119767	**4.8**	9767257	**42.1**	12317985	**53.0**	19456	**0.1**
1997	26261072	1275677	**4.9**	11100138	**42.3**	13860745	**52.8**	24511	**0.1**
1998	26973952	1342376	**5.0**	11251435	**41.7**	14365072	**53.3**	15068	**0.1**
1999	26587225	1820291	**6.8**	10862729	**40.9**	13849184	**52.1**	55021	**0.2**
2000	27774906	2175701	**7.8**	11565080	**41.6**	13986727	**50.4**	47398	**0.2**
2001	31334216	2658240	**8.5**	13368641	**42.7**	15261528	**48.7**	45807	**0.1**
2002	36059089	2790180	**7.7**	14657325	**40.6**	18464846	**51.2**	146738	**0.4**
2003	47252836	4344031	**9.2**	18494475	**39.1**	24125341	**51.1**	288989	**0.6**
2004	63167153	6530838	**10.3**	25945606	**41.1**	30501889	**48.3**	188820	**0.3**
2005	73476408	7997690	**10.9**	30289782	**41.2**	34835399	**47.4**	353537	**0.5**
2006	85534676	9423369	**11.0**	37788252	**44.2**	37790478	**44.2**	532577	**0.6**
2007	107271750	13754544	**12.8**	49402983	**46.1**	43695868	**40.7**	418354	**0.4**
2008	132027196	16725377	**12.7**	67733802	**51.3**	47076909	**35.7**	491108	**0.4**
2009	102142613	11116832	**10.9**	49734012	**48.7**	40733029	**39.9**	558739	**0.5**
2010	113883219	11771080	**10.3**	56380661	**49.5**	45320506	**39.8**	410972	**0.4**
2011	134906869	14191696	**10.5**	67941697	**50.4**	52218849	**38.7**	554626	**0.4**
2012	152461737	13733634	**9.0**	82655801	**54.2**	55556262	**36.4**	516039	**0.3**
2013	151802637	15592482	**10.3**	74817206	**49.3**	60732211	**40.0**	660738	**0.4**

Source: TurkStat (2014b)

Table 2.4.b Imports by Broad Economic Categories (BEC) (1996-2013)

Years	Total Imports (Thousand $)	Capital Goods (Thousand $)	Share of Capital Goods (%)	Intermediate Goods (Thousand $)	Share of Intermediate Goods (%)	Consumption Goods (Thousand $)	Share of Consumption Goods (%)	Others (Thousand $)	Share of Others (%)
1996	43626642	10253553	**23.5**	29114096	**66.7**	4020569	**9.2**	238425	**0.5**
1997	48558721	11107859	**22.9**	32119883	**66.1**	5051940	**10.4**	279039	**0.6**
1998	45921392	10660621	**23.2**	29906827	**65.1**	5005153	**10.9**	348791	**0.8**
1999	40671272	8727006	**21.5**	26854200	**66.0**	4820413	**11.9**	269653	**0.7**
2000	54502821	11365338	**20.9**	36009555	**66.1**	6928481	**12.7**	199447	**0.4**
2001	41399083	6940425	**16.8**	30300840	**73.2**	3813409	**9.2**	344409	**0.8**
2002	51553797	8399565	**16.3**	37655830	**73.0**	4898331	**9.5**	600071	**1.2**
2003	69339692	11325907	**16.3**	49734760	**71.7**	7813324	**11.3**	465701	**0.7**
2004	97539766	17397440	**17.8**	67549436	**69.3**	12100277	**12.4**	492612	**0.5**
2005	116774151	20363222	**17.4**	81868284	**70.1**	13975300	**12.0**	567345	**0.5**
2006	139576174	23347556	**16.7**	99604660	**71.4**	16116330	**11.5**	507629	**0.4**
2007	170062715	27054433	**15.9**	123639631	**72.7**	18694022	**11.0**	674629	**0.4**
2008	201963574	28020665	**13.9**	151747101	**75.1**	21489236	**10.6**	706571	**0.3**
2009	140928421	21462823	**15.2**	99509821	**70.6**	19289707	**13.7**	666070	**0.5**
2010	185544332	28818242	**15.5**	131445426	**70.8**	24734930	**13.3**	545734	**0.3**
2011	240841676	37270611	**15.5**	173140243	**71.9**	29692268	**12.3**	738555	**0.3**
2012	236545141	33925389	**14.3**	174930331	**74.0**	26699252	**11.3**	990170	**0.4**
2013	251661250	36771127	**14.6**	183811325	**73.0**	30415894	**12.1**	662904	**0.3**

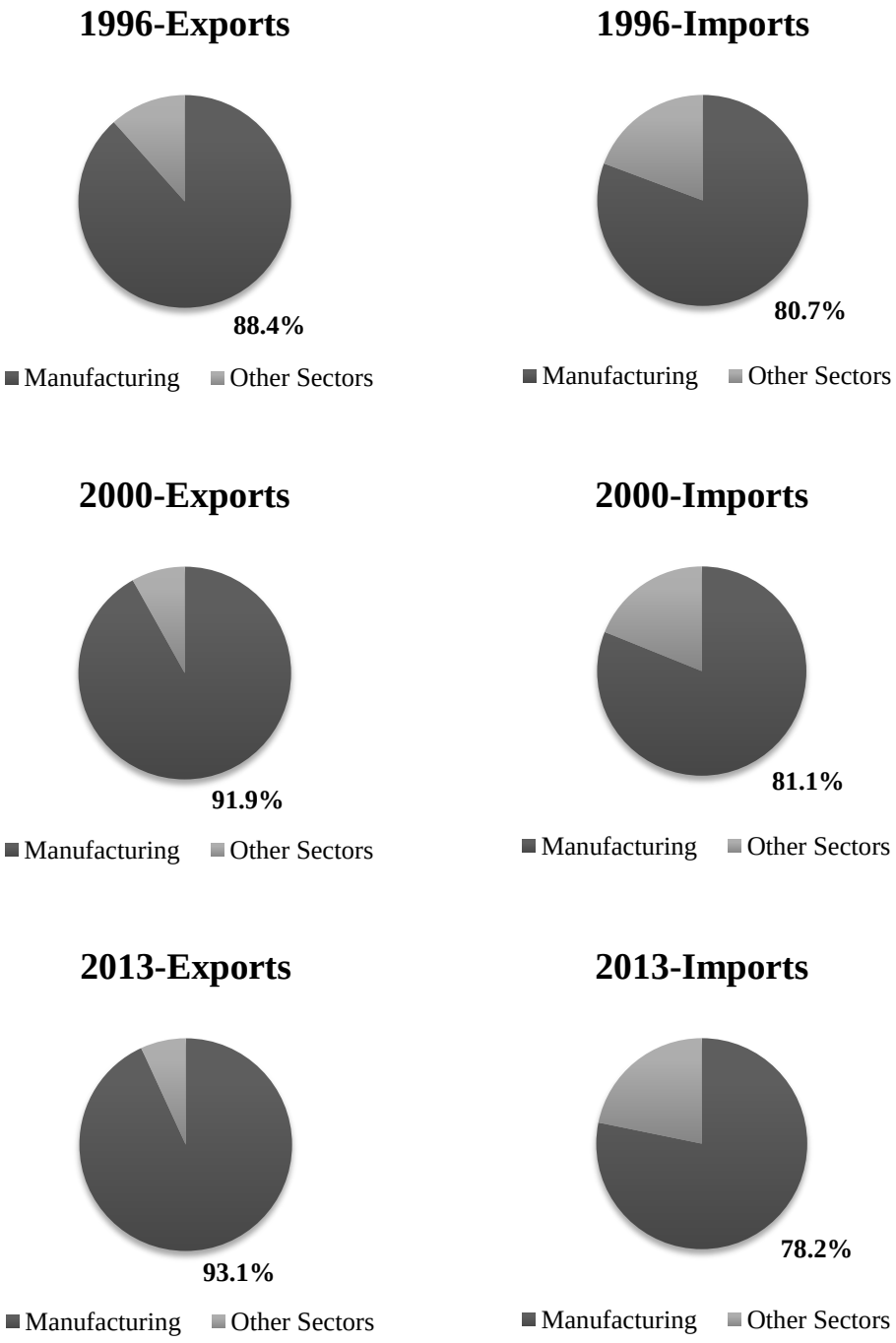
Source: TurkStat (2014b)

Table 2.5 Exports and Imports by ISIC, Rev.3 (1996-2013)

Years	Total Exports (Thousand $)	Manufacturing in Exports (Thousand $)	Share of Manufacturing in Exports (%)	Total Imports (Thousand $)	Manufacturing in Imports (Thousand $)	Share of Manufacturing in Imports (%)
1996	23224465	20525761	**88.4**	43626642	35207187	**80.7**
1997	26261072	23312800	**88.8**	48558721	39802296	**82.0**
1998	26973952	24064586	**89.2**	45921392	39024929	**85.0**
1999	26587225	23957813	**90.1**	40671272	33935827	**83.4**
2000	27774906	25517540	**91.9**	54502821	44200242	**81.1**
2001	31334216	28826014	**92.0**	41399083	32686102	**79.0**
2002	36059089	33701646	**93.5**	51553797	41383030	**80.3**
2003	47252836	44378429	**93.9**	69339692	55689766	**80.3**
2004	63167153	59579116	**94.3**	97539766	80447302	**82.5**
2005	73476408	68813408	**93.7**	116774151	94208255	**80.7**
2006	85534676	80246109	**93.8**	139576174	110378826	**79.1**
2007	107271750	101081873	**94.2**	170062715	133938136	**78.8**
2008	132027196	125187659	**94.8**	201963574	150252335	**74.4**
2009	102142613	95449246	**93.4**	140928421	111030525	**78.8**
2010	113883219	105466686	**92.6**	185544332	145366975	**78.3**
2011	134906869	125962537	**93.4**	240841676	183930287	**76.4**
2012	152461737	143193911	**93.9**	236545141	176235027	**74.5**
2013	151802637	141358199	**93.1**	251661250	196822807	**78.2**

Source: TurkStat (2014b)

Figure 2.7 Share of Manufacturing Sector in Exports and Imports (ISIC, Rev.3) (1996-2000-2013)



Source: TurkStat (2014b)

3. THEORETICAL BACKGROUND

This chapter of the dissertation aims to present the theoretical background that constitutes the basis for our empirical specifications of labor demand estimations in Chapter 6. In other words, this theoretical discussion is purposive and essential for the linkage between the theory and empirical work. Since the focus of this dissertation is on the labor demand behaviors of firms, most of the interest is inherently on the microeconomics of labor demand. So, in brief, this chapter includes the compilations, extensions and expositions of a number of important theoretical points within the related literature of labor demand microeconomics.

This chapter is divided into two main subchapters. The first part deals with the static theory of labor demand. Those are the aspects of labor demand in static (long-run) equilibrium. The focus in this first subchapter is on the substitution issues among inputs of production.[36] The second part of the chapter deals with the dynamic theory of labor demand. It gives the short-run perspective. This second subchapter focuses on labor demand adjustments to shocks (in product demand and factor prices) and constitutes the relevant empirical basis to consider the implications of adjustment costs.[37]

Since labor economics is basically about wage and employment determination in labor markets, it has supply and demand aspects to set the prices and quantities as in a usual context of simple market analysis. Studies about labor supply basically investigate the factors which determine how many workers choose to enter into the labor market and how many hours those workers are willing to rent their labor to the employers. Shortly, they are concerned with the incentives of individuals who have to provide labor services. However, labor market outcomes depend not only on the willingness of workers to supply their labor, but also on the willingness of employers to hire those workers. So, the theoretical and empirical studies about labor demand which are concerned with the incentives of firms which have to employ labor services identify the factors characterize the demand side of the labor market.[38]

[36] Scale effects and the changes in product demand are also important for static labor demand. However their analysis is more basic than substitution issues. But they have not received so much attention in the empirical research (Hamermesh, 1993).
[37] It is assumed that firms cannot fully adjust their level of labor to the desired level in the short-run.
[38] However, it is useful to note that the study of labor economics does not only consist of labor supply and labor demand. There are too many major themes in their own right.

However, so far, there is an imbalance between the number of studies on labor supply and labor demand in the literature. Supply side of labor markets is mostly studied field due to various reasons. In the empirical literature, we know less about labor demand. One of the major reasons behind this knowledge gap is less availability of cross-section micro datasets on firms than on households (Hamermesh, 1993). Most of the empirical studies on labor demand for developed countries are based on time-series analyses. This is similar, even worse for developing countries. Many studies on labor supply for developing countries have been conducted with micro data. However the empirical studies about labor demand in these countries are bounded with cross-country or intertemporal comparisons at the industry or aggregate level (Roberts and Skoufias, 1997). So, we do not have so much evidence on how firms react to changes in the cost of labor or the demand for their outputs as we have on how individuals react to changes in the labor market. In sum, labor demand is comparatively in the darker side of labor economics.[39] Nevertheless, after a long-term neglect, labor economists have demonstrated interest in labor demand in the last three decades. Especially some topics which link labor markets with product markets, international trade, financial markets, and corporate finance leads to a revival of interest in labor demand (Addison et al., 2014). At this point, the major question has to be asked: why should labor demand be studied separately from the demand for other inputs? (Hamermesh, 1993) Or shortly, why do we need to study labor demand?

Hamermesh (1993, p.3) defines labor demand as "*any decision made by an employer regarding the company's workers – their employment, their compensation, and their training"*. In the context of neoclassical economics, the demand for labor is defined as a derived demand which simply means that workers are hired for their contribution toward producing some goods and services (Marshall, 1920). Explicitly, this means that firms' labor demand is not so different from their demand for other inputs (such as land, buildings, machines etc.) in the production process. They are all derived from the wants and desires of consumers. Since the basic assumption of neoclassical theory for firms is to utilize the services of labor by combining them with other inputs to maximize their profits, this leads to an opinion that the strength of

[39] For the reasons of this ignorance to the labor demand in detail, see Hamermesh (1993, p.6-7).

demand for labor depends on the productivity of labor and the market value of the output produced. Therefore, the fundamental determinants of labor demand are simply marginal productivity of labor and the value or price of its output.

This mainstream neoclassical view of labor demand is still the one adopted in many studies today. However, during the discussions over time, labor demand is frequently mentioned side by side with the study of production theory and its implications for employment and hours.[40] Moreover, the production theory is seen as synonymous with labor demand. But labor demand is not a simply branch of production theory. Despite the neoclassical theory of factor demand applies to the study of the demand for other productive inputs and the theory of labor demand is a part of this wider context, there are still many reasons why labor demand should be studied separately from the demand for other productive inputs.[41]

First, labor is the most important input among productive inputs in terms of its share on factor payments. But size does not make the labor demand subject attractive alone or it does not make its analyses different from the other inputs' analyses. Secondly, labor is the only productive input that requires the owner of the services presents himself or herself where they are delivered (Marshall, 1920). This aspect actually relates more closely to the workers' use of time, and so to the supply decisions of labor than to labor demand. However, "*nonpecuniary factors such as work environment, risk of injury, personalities of employers or managers, perceptions about fair treatment, and flexibility of work hours"* create differences in employment transactions than they do in markets for commodities (Ehrenberg and Smith, 2012, p.2). That's why employers' demand for labor cannot be characterized by spot markets as emphasized by Hamermesh (1993). Finally, there are important social and political issues related with labor demand. Many central questions in economic policy consider the number of workers employed and the wages paid. These policies about minimum wages, employment subsidies, and some restrictions on employers' ability to fire workers are all attempts to regulate the labor demand. These institutions and legislations that influence the employment relationship do not exist in other markets. Therefore, when these entire factors are considered as a whole, such as our interest in policies that

[40] Especially, after the developments with Hicks (1932).
[41] For a broader discussion, see Hamermesh (1993, p.4).

regulate the labor market, labor's importance in production, and the requirement that workers be physically present on the job are sufficient to make the study of labor demand a subtopic in its own right (Hamermesh, 1993). That's why labor economists devote a great deal of their time to the separate study of labor demand.

Keeping all these in mind, when we return to the microeconomics of labor demand, it basically proposes that both the scale and substitution effects accompanying a labor cost change suggest the demand curve for labor is a downward-sloping function of the labor cost. If this simple proposition is true, then policies that increase the costs of labor have employment reducing effects. Indeed this is the basic neoclassical view. However, on the other side, according to the Keynesian theory, labor costs or wages are not only the determinants of labor demand, but also components of consumers' demand for goods. Therefore, an increase in labor costs (especially wages) may increase employment through increases in aggregate demand in the economy. (Bowles and Boyer, 1995). So, understanding the characteristics of labor demand curves is so crucial to design the public policy.

This dissertation study theoretically takes the downward-sloping nature of labor demand curves as given and addressing instead of why, it tries to understand why declines in labor demand might be large in some cases and barely perceptible in others in the face of a given change in costs of labor. So, after the theoretical foundations of the labor demand theory are presented in this chapter, the focus of this research is to empirically estimate the degree to which employers respond to changes in costs of employing labor (see Chapter 6).

The rest of this chapter includes two subchapters, namely the static theory of labor demand and the dynamic theory of labor demand, respectively.

3.1. The Static Theory of Labor Demand

The static labor demand theory basically deals with the decisions of employers with respect to the quantity of labor to be used in the production process and it focuses on the changes of desired quantities in response to marginal changes in factor prices and product demand. Since the structure of production process is a crucial element in the transmission mechanism of the shocks from product and input markets to the

employment and wage outcomes, static labor demand theory is a branch of production theory. Although abovementioned specific nature of labor input prevails, labor demand is a typical derived demand in itself. Therefore, any progress made in production theory directly lead to a progress in the static labor demand theory (Addison et al., 2014).

Most studies in the labor demand literature distinguish the static theory of labor demand from the dynamic theory. The major difference between these two theories is that the static theory of labor demand ignores the adjustment costs of labor. These adjustments costs are fundamentally connected to changes in the volume of labor. If such costs are ignored, nothing prevents labor demand from reaching its desired level immediately, so there are no dynamics. In other words, static theory does not aim to describe the path of labor demand towards the new optimal equilibrium value after an exogenous shock. Instead, static labor demand theory just gives the opportunity to analyze the long-run effects of an exogenous shock and these are the outcomes after the adjustment process has been fully completed in the labor market (Lichter et al., 2012).

Nevertheless, the static labor demand theory can provide us to grasp a sound understanding for the analyses of labor market. By not considering delays in the adjustment process, static theory puts the basic properties of labor demand. These properties are sometimes called even as laws. These laws provide the qualitative results about the directions in which the quantity of labor demanded varies as responses to the production costs, and at a detailed level, they also characterize the factors that determine the extent of the elasticities of labor demand. Knowing and understanding the magnitudes of these elasticities are crucial to assess the implications of economic policy, because they provide to quantify the response of firms when a policy change has been done.[42] Hence, it is sometimes sufficient and useful to get knowledge about the eventual new equilibrium, and disregarding the adjustment path towards this new equilibrium can be accepted. In this context, Hamermesh (1980) argues that *"most lags in the adjustment of labor demand to its long-run equilibrium do not appear to be very long"*. He justifies the slow adjustment of relative wages to exogenous shocks with the lags in suppliers' decisions about training and mobility (Hamermesh, 1986). That being the case, Hamermesh (1986) finds the theory of labor demand in the long-run, and the

[42] A recent study by Hamermesh (2014) emphasizes the importance labor demand elasticities to evaluate the impacts of policies.

estimates of parameters describing labor demand useful in answering the questions of interest to policy-makers. At the end, it allows us to investigate the equilibrium effects of changes in wage rates or the output on the amount of workers employed (Lichter et al., 2012). Addison et al. (2014) also states that the knowledge produced by the studies of static labor demand is instrumental for predicting the effects of policies which alter wage and employment outcomes. Moreover, they argue that static labor demand studies are an essential component of the policy advisor's toolkit. This is mainly because static labor demand theory provides explanations about determinants of elasticities and about possibilities of substitution among different inputs in the long run (Lichter et al., 2012).

In this subchapter, we deal with the aspects of labor demand in static equilibrium. The demonstration in this part provides the ability to infer the parameters describing employers' long-run demand for labor from the data which are characterizing their employment, wages, product demand, and the prices and quantities of other inputs. Much of the exposition in this part includes the elements of standard neoclassical theory of factor demand, in which the effects of small changes on the factor demand are analyzed. At this point, the aim in this part is not to repeat the theory overall, but rather to show how it can be used to infer the parameters that are estimated within the empirical part of the dissertation. The entire discussion in this part assumes that a demand curve exists at the level of the firm, labor is homogeneous in terms of hours worked and effort per hour, the typical firm maximizes its profits, employers are perfect competitors in the labor market and in the product market.

The exposition of the theoretical discussion for the static labor demand in this part is based on the two-factor case.[43] While these theoretical results on labor demand may be generalized to multi-factor inputs, many beneficial intuitions are provided with examining the demand for homogeneous labor when there is only one cooperating factor. At that point, since it constitutes the second biggest component of value added in most industries, the conventional assumption is to assume that capital is the other factor in the production. Beyond its pedagogical advantages, many specific mathematical forms of the production and cost functions from which labor demand functions are derived were initially developed for the two-factor case. Moreover, the theoretical

[43] The exposition of the theoretical discussions in this subchapter is mainly adopted from Hamermesh (1993).

results derived from one-factor case (e.g. that the labor demand curve slopes downward and that the elasticity of product demand affects labor demand) are not so much useful on the theoretical basis for empirical researches in this field of study. In addition to that, only one input assumption is not realistic and does not answer the question of why there should be diminishing returns to the single production factor. Secondly, factor substitution is an important notion for empirical works and it is not possible to discuss the results when we assume only one input.

Following the notations of Hamermesh (1993), for the two-factor model of the demand for homogeneous labor, we assume that production exhibits constant returns to scale, as described by the linear homogenous function *F*, such that:

[3.1]

$$Y = F(L, K), F_i > 0, F_{ii} < 0, F_{ij} > 0$$

where Y is output, and K and L are homogenous capital and labor inputs, respectively. This simple production function represents how much output is produced by any combination of labor and capital.

In this initial part of the derivation, we assume the firm maximizes profits

[3.2]

$$\pi = F(L, K) - wL - rK$$

where w and r are the exogenous prices of labor and capital services respectively, and we assume that the competitive product price is one (the price of output is unity).

Maximizing [3.2] yields

[3.3]

$$F_L = w$$

and

[3.4]

$$F_K = r$$

The competitive firm sets the value of the marginal product of each factor equal to its price.

[3.5]

$$\frac{F_L}{F_K} = \frac{w}{r}$$

The ratio of [3.3] to [3.4] is the familiar statement in theory that the ratio of the values of marginal products, namely the marginal rate of technical substitution, equals the factor-price ratio for a profit maximizing firm.

Another important parameter of interest in that framework is the elasticity of substitution between K and L, holding output level constant. This is the rate of change in the use of K to L from a change in the relative price of w to r, holding output constant.

Allen (1938, p.341) defines the elasticity of substitution between the services of capital and labor as "*the effect of a change in relative factor prices on relative inputs of the two factors, holding output constant"*. In other words, "*it is the effect of a change in the marginal rate of technical substitution on the ratio of factor inputs"* (Hamermesh, 1993, p.23).

In this two-factor linear homogenous case, the elasticity of substitution is[44]

[3.6]

$$\sigma = \frac{d\ln(K/L)}{d\ln(w/r)} = \frac{d\ln(K/L)}{d\ln(F_L/F_K)} = \frac{F_L F_K}{Y F_{LK}}$$

According to this definition, σ is always nonnegative.

Hamermesh (1993, p.23-24) states the intuition behind this elasticity as "*it measures the ease of substituting one input for the other when the firm can only respond to a change in one or both of the input prices by changing the relative use of the two factors without changing output"*.

[44] See Allen (1938, p.342-343).

Accordingly, if σ approaches infinity, the two factors become perfect substitutes, while as σ approaches zero, the two factors cannot be substitutes. This means that low values of σ are preferable from the perspective of labor, because it means that a firm cannot replace labor easily with another factor.

The value of F_{LK} depends on the shape of the production function, but is always positive under usual production functions assumptions.[45]

Following Allen (1938, p.372-373), the price elasticity of labor demand with constant output and r is

[3.7]

$$\eta_{LL} = -[1 - s]\sigma < 0$$

where $s = wL/Y$, the share of labor in total revenue. In other words, η_{LL} shows the constant-output labor-demand elasticity for homogeneous labor and states how much labor demand is decreased if labor costs increase by one percent while output remains constant. This is also called as conditional (or compensated) labor demand elasticity in the literature.

For the share of labor, (s), again Hamermesh (1993, p.24) states the intuition behind η_{LL} as "*it is smaller (less negative) for a given technology σ when labor's share is greater, because there is relatively less capital toward which to substitute when the wage rises"*. In other words, when the production of output requires higher amounts of labor, the constant output labor demand elasticity will be smaller, because the possible change in spending on other factors of production is small relative to the amount of labor being used.

On the other hand, if the elasticity of substitution (σ) is high, this means that to sustain a given level of production, employer has the possibility of reducing largely the utilization of one factor and largely increasing that of the other, in consequence a change in the relative price of the factors.

[45] That means, we assume that both labor and capital services are supplied elastically to the firm. See Hamermesh (1993, p.25) for details.

This equation in [3.7] also reflects the second of Marshall's four laws of derived demand, which states that the more easily the other factor is substituted for labor higher the labor demand elasticity. So it is just about the substitution between inputs.

Additionally, we also need to take into account the possibility that output will change as a response to a change in the cost of labor, and that in turn may affect the overall demand for labor, this is known as the scale effect and we can take into account this effect.

The mechanism behind this effect is given by Hamermesh (1993, p.24): *"when the wage rate increases, the cost of producing a given output rises. In a competitive product market a 1 percent rise in a factor price raises cost, and eventually product price, by that factor's share. This reduces the quantity of output sold. So the scale effect is thus the factor's share times the product-demand elasticity"*.

Therefore, to obtain the total (also known as uncompensated or unconditional) demand elasticities for homogeneous labor, scale effects must be added to [3.7]:

[3.8]

$$\eta'_{LL} = -[1 - s]\sigma - s\eta$$

The term $s\eta$ reflects Marshall's first law of derived demand: Input demand is less elastic when the demand for the product is less elastic.

Equation [3.8] is accepted as one of the most important parameter in the static theory of labor demand and called as *the fundamental law of factor demand* in the literature. This well-known law of Hicks holds in an environment in which constant returns to scale production, and every firm faces the same production function and output demand elasticity.[46] According to this law the labor-demand elasticity includes two parts, namely substitution and scale effects. The first term in the equation, $-[1 - s]\sigma$, is the substitution effect. Substitution effect means that, for a given level of output, how much firms substitute away from labor towards other factors of production when labor costs rise. As we abovementioned, this term $-[1 - s]\sigma$ is often called the

[46] For the case with decreasing returns to scale, see Mosak (1938).

constant-output labor-demand elasticity, distinct from the total elasticity η'_{LL}. The second part in the equation, $-s\eta$, is the output effect or scale effect. It is about how much labor demand changes after a labor cost change due to the change in the firm's output. Higher (lower) labor costs lead higher (lower) production costs and thus, moving along the product-market demand schedule, lower (higher) output for firms. So, when labor costs rise, both the substitution and scale effects reduce labor demand. Firms substitute away from labor towards other factors, and with higher costs firms produce less output such that they demand less of all factors. Therefore, $\eta'_{LL} < 0$, labor demand slopes downwardly (Slaughter, 2001).[47]

Equations [3.7] and [3.8] are helpful to estimate the labor demand elasticity, depending on the assumptions made about the problem under study. For competitive firms in a particular industry which can expand or contract the production level as the labor costs change, scale effects on labor demand are relevant and in that case unconditional labor demand elasticity [3.8] is appropriate equation for interpreting the effects of changes in input prices. To consider the entire economy assuming the output constant, conditional labor demand elasticity [3.7] is appropriate measure of long-run effects. Nevertheless, knowledge of the magnitude both of these elasticities becomes very important when the impact of economic policies on labor market is assessed.

The next question herein is what determines these elasticities of labor demand, or what the driving forces are behind labor demand elasticities. The theoretical answers for those questions are given by well-known Hicks-Marshall rules of derived demand.[48] These rules are also investigated empirically by researchers to establish whether neoclassical theory can give some guidance in understanding firms' labor demand behavior.[49]

[47] So, by the fundamental law of factor demand, the total (unconditional) elasticity exceeds the constant-output (conditional) elasticity of labor demand in absolute terms, given that it also includes the price elasticity of product demand (Hamermesh, 1993).
[48] See Hicks (1932) and Marshall (1920).
[49] See Konings and Lehmann (2002) for an applied study testing these rules of derived demand.

These rules are valid when the economy is in equilibrium (i.e. in the long-run) and so they are related to the unconditional demand for labor, when output is allowed to vary.

Therefore, fundamental factors that influence the own-wage elasticity of labor demand can be summarized by these Hicks-Marshall laws of derived demand. Below are the four Hicks-Marshall rules of derived demand. These laws assert that, other things equal (ceteris paribus), the own-wage elasticity of demand for a category of labor is high under the following conditions:[50]

1. When the price elasticity of demand for the product being produced is high.

2. When other production factors can be easily substituted for the category of labor.

3. When the supply of other production factors is highly elastic (that is, usage of other production factors can be increased without substantially increasing their prices).

4. When the employment cost of any category of labor is a large share of the total production costs.

These laws are generally valid as an empirical proposition. Moreover, the first three can be proved to always hold. However, there are some conditions under which the fourth law does not hold.

In seeking to explain why these laws hold, it is useful to act as if we could divide the process by which an increase in the labor costs affects the demand for labor into two steps as it is aforementioned:

First, an increase in the wage rates raises the relative cost of labor and leads to employers to use less of it and more of other inputs. This is what we called as the substitution effect.

[50] For a good intuitive discussion of these laws, see Stigler (1987).

Second, when the wage increase yields the marginal costs of production to surge, there are pressures to increase the prices of products and reduce output, leading a decline in employment. This is the scale effect again mentioned.

Before we demonstrate our specific functional form to constitute the basis for our static empirical specifications, we need to elaborate the factors behind the elasticity of labor demand given by these four rules of Hicks-Marshall. These factors enable us to infer the empirical results vis-a-vis the theory.

The first thing we look at is the link to the final product market. Suppose that the labor costs increase. This causes production costs to rise and tends to result in a product price increase. The greater the price elasticity of demand for the final product, the larger will be the decrease in the demand for the firm's output; and the greater the decrease in output, the larger the decrease in employment. Therefore, this is due to a scale effect. Thus, *the greater the elasticity of demand for the product, the greater the elasticity of demand for labor*. This law reflects the characteristics of labor demand as derived demand and so it relates the labor market to the product market.

There are three implications regarding this first proposition of Hicks-Marshall laws of derived demand:

First is the demand for labor for a unique firm is more elastic than the industries demand for labor in which that firm belongs. That means η higher at firm-level than at market-level.

Why? Intuitively, the demand for a single firm's output is often highly sensitive to its price due to the existence of very close substitutes produced by other firms in the same market. In other words, demand tends to be less elastic at the industry level (since it is more difficult for consumers to find substitutes). Hence, by the first law, we should expect labor demand at the firm level to be more sensitive to a labor cost increase than is the labor demand at the market/industry level to the labor cost changes at the industry level.

Secondly, for the same reasons, the labor demand curve for a monopolist is less elastic than for an individual firm in a competitive industry. Monopolists face market demand curves for their product because they are the only seller in the particular market. On the other hand, firms in perfect competition take the product price as given, and hence perceive product demand to be perfectly elastic. That means η is higher for perfectly competitive firms than for monopolists.

Third implication is that labor cost elasticities are higher in the long run than they are in the short run. That means η is higher in long-run than in short-run. After all, we expect product demand to be more price sensitive in the long-run than in the short-run as consumer have more time to adjust their consumption behaviors.

The second rule is about the availability of substitute inputs. In other words, it is about technology.

Here the question is whether there is a technological possibility to replace a relatively expensive factor by a relatively cheap one without changing the output. For complementary production factors (as in Leontief production functions), the relative prices have no effect on the substitution of factors. However, the elasticity of labor demand depends on the elasticity of substitution for substitutive production factors.

This second law stresses the ease with which the employer can substitute for the particular category of labor. As the labor costs increase, the employer will have an incentive to substitute other, now relatively cheaper, inputs. Suppose however that there were no substitution possibilities. In this case there is no reduction in labor demand due to substitution effect, only due to the scale effect. In contrast, when it is possible to substitute, labor demand will decrease both due to the scale and the substitution effect.

There are two implications for this second proposition of Hicks-Marshall law of derived demand:

Again, it implies that η is higher in long-run than in short-run. We expect that it is easier for employer to substitute among factors of production in a longer time horizon.

Another implication is that η can depend on some institutions (unions, safety regulations etc.). Also, this may include some rules, for instance regulations determining minimum crew size. Note that, it is not uncommon for unions to bargain over how inputs are combined.

As noted just above, when the labor costs increase, the employer will have an incentive to substitute other, now relatively cheaper, factors of production. However, suppose that when the employer tries to buy more of the other input, this leads to a sharp price increase of that input. Suppose that the employer can try substitute for labor by buying some equipment. However, the firm providing the equipment can only deliver this if the price is increased (e.g. due to the need to pay overtime for its workers). In this case, clearly, the employer will be less keen to replace labor with capital, hence reducing the own-wage effect.

The third rule is about the elasticity of supply of substitute inputs. In other words, it is about market conditions.

The rule is that the demand for labor is more elastic the greater the supply elasticity of other factors of production, such as capital. In other words, when the usage of other factors of production can be increased without substantially increasing their prices, we expect that the elasticity of labor demand will be high.

The single implication of that rule is that η higher in long-run than in short-run. In this case we expect that the supply of other factors of production will be more elastic in the long run than in the short run.

The final rule stressed is the share of labor in total cost of production. The idea here relates to the scale effect. Suppose that labor cost is (initially) as large fraction of total cost. In this case a wage increase will significantly increase total costs; this implies that the firm will need to put the price up quite a lot, and as a result, output and employment will go down quite a lot.

However, this preposition is only valid if the demand elasticity of the final product is higher than the elasticity of substitution between the production factors.

After these detailed explanations and implications of the factors behind the labor demand elasticity, now we make a transition from the standard neoclassical model of static theory to the specification of functions for empirical estimations.

Since aforementioned, most theoretical improvements in static labor demand theory stem from the studies of the neoclassical theory of production. Theoretical studies about the production technologies contributed with increasingly complex and flexible representations. These representations evolve from the standard Cobb-Douglas production function (1928), through CES (Arrow et al., 1961), to generalized Leontief (Diewert, 1971) or translog functions (Christensen, Jorgensen, and Lau, 1973). All these production functions have been used to derive equations for labor demand which are usable in empirical studies (Addison et al., 2014). Estimating labor demand elasticities also needs to propose a production function which enables the estimation process. So, these are the main specific functional forms that have been used to infer the sizes of the crucial parameters (such as σ, η_{LL}, and η'_{LL} in our context) in empirical studies of labor demand.[51] In this dissertation study, following Arrow et al. (1961), the constant elasticity of substitution (CES) function forms the functional basis of our static empirical specifications.

The linear homogenous production function is

[3.9] $$Y = [\alpha L^{\rho} + (1-\alpha)K^{\rho}]^{1/\rho}$$

where α and ρ are parameters, $1 > \alpha > 0$, $1 \geq \rho \geq -\infty$.

Marginal products are

[3.10] $$\frac{\partial Y}{\partial L} = \alpha\left(\frac{Y}{L}\right)^{1-\rho}$$

and

[51] However, Addison et al. (2014) argues that these theoretical developments in the production theory have added little to our knowledge of labor demand. They argue that most estimates of labor demand elasticities fall within the interval of 0.4-0.6 independently of the functional form adopted. Moreover, they state that similar estimates were obtained with non-structural specifications of the labor demand equation.

[3.11]

$$\frac{\partial Y}{\partial K} = [1-\alpha](\frac{Y}{K})^{1-\rho}$$

Letting the ratio of these equal to the factor-price ratio, taking logarithms, and differentiating with respect to $\ln(w/r)$, and making $\sigma \geq 0$, yields:

[3.12]

$$-\frac{\partial \ln(K/L)}{\partial \ln(w/r)} = \sigma = \frac{1}{[1-\rho]}$$

The CES is adequately broad that any value of $\rho < 1$ is appropriate and σ is free to vary between 0 and ∞, so that one can infer its size and that of the η_{LL}.

Among special cases are:

(a) the Cobb-Douglas function [$\rho = 0$, as should be clear from $\sigma = \frac{1}{[1-\rho]}$]

(b) the linear function ($\rho = 1$), in which L and K are perfect substitutes [go back to $\sigma = \frac{F_L F_K}{Y F_{LK}}$, and note that if $\rho = 1$, so that $Y = [\alpha L^{\rho} + (1-\alpha)K^{\rho}]^{1/\rho}$ is linear and $F_{LK} = 0$, $\sigma = \infty$]

(c) the Leontief function ($\rho = -\infty$), in which output is the minimum function $Y = \min\{L, K\}$, and the inputs are not substitutable at all.[52]

The constant-output factor-demand elasticities (conditional elasticities) follow immediately from the definitions and the recognition that α is labor's share of revenue if the production factors are paid their marginal products (Hamermesh, 1993).

The second approach is based directly on a cost function defined a priori, without specifying the associated production function.

Empirical studies aiming to estimate a cost function directly posit an analytic form satisfying the theoretical properties of such a function, i.e., concavity,

[52] For the arithmetic demonstration, see Varian (1984, p.18).

homogeneity of degree 1 with respect to the costs of the factors, as well as being increasing with respect to the output level and the input quantities (Cahuc and Zylberberg, 2004). And thanks to Shepard's lemma, the partial derivatives of this cost function give the conditional factor demands, which it thus becomes possible to estimate the labor demand elasticities.

The CES cost function can be derived (Ferguson, 1969) as

[3.13]

$$C = Y[\alpha^{\sigma} w^{1-\sigma} + [1-\alpha]^{\sigma} r^{1-\sigma}]^{1/(1-\sigma)}$$

where, as before, $\sigma = \frac{1}{1-\rho} \geq 0$.

The demand for labor is

[3.14]

$$L = \frac{\partial C}{\partial w} = \alpha^{\sigma} w^{-\sigma} Y$$

Taking the ratio of this to the demand for K, the elasticity of substitution can again be shown to be σ.

Taking logarithms yields

[3.15]

$$\ln L = \alpha'' - \sigma \ln w + \ln Y$$

where α'' is a constant. This form in [3.15] is very useful for labor demand estimation and it constitutes the theoretical basis for our empirical specifications (for static specifications) to estimate the long-run labor demand elasticities (see Chapter 6). Therefore, we showed how production theory provides a static framework for empirical research to generate estimates of interested parameters, particularly for the constant-output demand elasticity for homogeneous labor in our case.

3.2. The Dynamic Theory of Labor Demand

As we mentioned in the previous subchapter, the static theory of labor demand does not consider the adjustment costs of labor and if such costs do not exist, there are no dynamics (Cahuc and Zylberberg, 2004). However, we also mentioned that static theory of labor demand have also provided some useful insights and knowledge about the magnitudes of labor demand elasticities and about the substitution possibilities between different inputs in the long run.

Dynamic theory of labor demand contributes to this knowledge by adding the effects of adjustment costs. These are the costs of changing employment and dynamic models of labor demand obviously account for these costs.[53] So, the dynamic models are accepted as appropriate forms of presenting the adjustment process towards a new equilibrium and they are essential toolkits to analyze firms' short-run reactions to exogenous shocks. This is mostly because the path of a firm's labor demand level towards a new equilibrium value is heavily affected by the size and structure of the adjustment costs (Lichter et al., 2012). Therefore, the form and speed of labor adjustments are also the subjects of that theoretical framework and their analyses are also objects of numerous empirical studies.[54] Taking these adjustment costs into account provides hiring and firing strategies for the firms facing shocks in the random economic environments. The sources of these adjustment costs may be institutional regulation and some economic or technological obstacles. For instance, training of new workers may cause breaks in production process or the indivisibility of production factors, such as labor and capital may prevent firms from changing their employment level and may cause such costs. Therefore, these costs may lead some situations in which firms cannot change their labor demand after an exogenous shock since the adjustment costs outstrip the gains from changing employment towards an optimal level (Hamermesh, 1993; Hamermesh and Pfann, 1996). As a consequence, employment volatility may reduce with adjustment costs, and this causes persistent employment levels for firms.

[53] See, for example, Eisner and Strotz (1963), Sargent (1978), Nickell (1986), Hamermesh (1993).
[54] See, Nickell (1986), Hamermesh and Pfann (1996) for a theoretical discussion; Cooper and Willis (2004), Nilsen, Salvanes, and Schiantarelli (2007) for empirical studies.

In a nutshell, theoretically, the structure for the labor demand function bases on the assumptions about the technology (the form of the production function), the adjustment costs, the structure of product and factor markets, and the behavior of the firm, and expectations. If the technology is homothetic, if there exists no adjustment costs, if markets are perfectly competitive and if expectations are rational, then the labor demand function can be reduced to the static labor demand function. That is current employment level is equal to the desired employment level which is determined only by current prices. However, the negligence of any one of these assumptions will necessitate using a dynamic labor demand equation with the adjustment terms and a distributed lag in prices (Taymaz, 1999).

The adjustments mentioned in the static theory take time. Any exogenous shocks into the prices do not immediately change the labor demand. These dynamic responses take time, because they have some adjustment costs for employers to alter the equilibrium factor demand due to ongoing process of reorganization arising from technological constraints, market fluctuations (economic constraints), and labor mobility. Hamermesh (1993) defines the dynamics of labor demand as *"the process of moving toward new steady-states - the time it takes and the paths traced out by the inputs"*. So these adjustment costs may lead some situations in which firms prefer to adjust employment gradually or even not at all towards a new equilibrium value after an exogenous shock. Hamermesh (1993) argues that this process has particular importance in two major areas, namely labor hoarding (cyclical behavior of the productivity of labor) and job security. Labor hoarding is defined as "*a less than proportionate decrease in worker-hours in response to a negative demand shock"*. Its rationale has been based on the employers' optimal response to adjustment costs (Oi, 1962). Adjustment costs may reduce employment volatility and may lead to keep their employment levels persistent for firms. On the other hand, policies designed to enhance job security which aims to reduce layoffs and fluctuations in employment are another area concerned with this literature. Here, again the point is to change the costs of adjustment. Therefore, the focus of the dynamic theory is the costs of adjusting the quantities of labor input. So, inherently, the magnitudes and structures of these costs are the main following issues for the dynamic labor demand theory.

In sum, the path of a firm's labor demand adjustment after an exogenous shock is shaped by the structure of the adjustment costs (Hamermesh, 1993). So, the specification of the adjustment cost function, in other words the structure of these costs is important in modeling the dynamics of labor demand. Early studies of dynamic labor demand impose an autoregressive structure and assume that labor quantities smoothly adjust to their long-run desired levels. Hence, the rationale of convex (quadratic) symmetric adjustment costs at micro level are assumed and partial adjustment models become typical in the dynamic theory of labor demand.[55] However, further evidence shows that the adjustment technology at the micro level may be non-convex.[56] Besides, although the partial adjustment model might not capture all dynamics of a firm's adjustment path,[57] it has remained the major tool for dynamic labor demand studies.[58]

To derive the optimal path of employment adjustment, standard approach is to solve a dynamic optimization problem where firms maximize the present discounted value of future profits and face costs of adjusting the labor input. For the tractability, simplifying assumptions for the production technology (e.g. Cobb-Douglas), nature of the product market (e.g. perfect competition) and the expectation generation process (e.g. adaptive expectations) are made. Moreover, labor adjustment costs are commonly assumed to be quadratic in structure (Addison et al., 2014). In addition to these assumptions, throughout this subchapter, we assume that labor is the only input in the production process and worker-hours are equal to the employment.

Following these simplification and assumptions, in this subchapter we deal with the dynamics of labor demand and examine how the demand for labor adjusts.[59] In order to focus on the role of adjustment costs (due to such as capital constraints or the indivisibility of labor or capital), we assume that employment adjusts toward its static

[55] Sargent (1978) derives the partial adjustment model as the solution to a firm's dynamic profit maximization problem under rational expectations relying on the assumption of quadratic adjustment costs.
[56] See Nickell (1986), Bentolila and Bertola (1990) or Hamermesh (1993) for theoretical debate whether modeling a firm's adjustment costs function in a convex form is appropriate. See Caballero, Engel, and Haltiwanger (1997), Cooper, Haltiwanger, and Willis (2004) or Nilsen, Salvanes, and Schiantarelli (2007) for recent empirical studies on the structure of adjustment costs.
[57] For an extensive discussion, see King and Thomas (2006) or Cooper and Willis (2009).
[58] See, for example, Naveretti, Checci, and Turrini (2003) or Buch and Lipponer (2010).
[59] The exposition of the theoretical discussions in this subchapter is adopted from Hamermesh (1993).

(long-run) equilibrium value. In addition to that, we assume that employers project an equilibrium level of labor demand, L^*, from the current time through all future time and firms revise their forecasts of L^* and they accept the new forecast is the new permanent value.

We assume that adjustment costs are

[3.16]

$$C(\dot{L}) = a|\dot{L}| + b\dot{L}^2, \;\; a, b > 0$$

where $\dot{L}$ represent the change in L_t. According to this assumption, the marginal adjustment cost of a change (a small increase or decrease) in labor demand is

[3.17]

$$a + 2b|\dot{L}|$$

Here, the implicit assumption is that the costs of adjustment stem from the net change in employment.

We assume a fixed product price and all shocks are to wages. The employer aims to maximize

[3.18]

$$\pi = \int_0^\infty \{F(L_t) - wL_t - C(\dot{L}_t)\}e^{-rt}dt$$

where F is the production function (with only labor input) and we assume that the employer discounts future profits at a constant rate r. We describe the optimal path by the Euler equation,

[3.19]

$$2b\ddot{L}_t - 2br\dot{L}_t + F'(L_t) - w - ra = 0$$

In the steady state the demand for labor is fixed, that is $\dot{L} = \ddot{L} = 0$. And so equilibrium labor demand is determined by

[3.20]

$$F'(L^*) = w + ra$$

That means that the value of the marginal product of labor equals the cost of labor services. However, in this case, that cost includes the amortized cost of increasing or reducing the labor by one worker in addition to the wage.

Following Gould (1968), assuming static expectations about prices and wages, the optimal path of employment is

[3.21]

$$\dot{L}_t = \gamma[L^* - L_t]$$

where γ is a rate at which employment adjust toward L^* is an implicit function that decreases with the parameter b. This equation may be linked to an empirical specification by turning it in discrete time and putting determinants of L^*:

[3.22]

$$\Delta L_t = \gamma'[G(X_t) - L_{t-1}]$$

where X_t is a vector of determinants of L^* and $G(.)$ is a function that relates L^* with X. If we assume that G is linear and the current values of X are the determinants of L^*, then this equation takes the form of a typical geometric distributed lag which is used in the empirical studies. This simple typical form of estimating equations which measure the lag in response of labor demand to exogenous shocks is

[3.23]

$$L_t = \lambda L_{t-1} + \beta X_t + \epsilon_t$$

where λ and β are parameters, X is a vector of variables that affect long-run equilibrium values of L, and ϵ is a disturbance term. This specification in [3.23] is the econometric analogue to [3.22] and constitutes the theoretical basis for dynamic labor demand estimations (see Chapter 6). Also using this specification, the median length of the lag

(the time it takes the system to move halfway to the eventual equilibria in response to a shock) is get by solving for t^* in $\lambda^{t^*} = 0.5$ (Hamermesh, 1993).[60]

This equation implies that the dynamics of the responses to shocks to each variable in X are identical and we assume that employers either have static expectations or that their expectations are rational based on the processes which imply including only current values of the forcing variables. There are some studies have gone beyond this, but we will limit our specifications of the lag structure with this simple geometric lags of the labor input. Another limitation with this model is that it does not represent the simultaneous demand for heterogeneous labor. This means that we are not able to detect the determinants of persistence in employment. In other words, we cannot know the sources of lagged employment adjustment. It may be due to adjustment costs or may be due to other sources (Hamermesh, 1993, p.234).

Next chapter summarizes the results of some selected empirical studies interested in labor demand which mostly have similar theoretical bases in static and dynamic contexts presented in this chapter. The main focus while choosing these studies is that their interests on firms' labor demand reactions to the changes in the labor costs. In other words, they are the studies in which empirically estimate the labor demand elasticities. However, the findings of these studies show a great heterogeneity and the sources of this heterogeneity are various. In this dissertation study, our attention, in a broad sense, is on the relationship between globalization and labor demand elasticities, as one of possible sources for increasing labor demand elasticities. Therefore, specifically, the linkages between labor demand elasticities and three relevant subjects of globalization are analyzed during the rest of the study. Namely, these subjects are international trade, international outsourcing, and nationality of ownership, respectively. Thus, the contents of selected empirical studies in the next chapter are mainly on the empirical testing of theoretical relationships of labor demand elasticities with those three subtopics of globalization.

[60] For additional explanations about the median length of the lag, see Chapter 6.

4. EMPIRICAL LITERATURE ON THE LINKAGES BETWEEN LABOR DEMAND AND GLOBALIZATION

Firms' labor demand reactions to the changes in the labor costs attract a great deal of attention both in the empirical literature and policy analyses. As a consequence of this interest, there are an extensive number of empirical researches in this field of labor demand. Each study in this survey estimates the labor demand elasticity. However, these estimates of labor demand elasticities show a great heterogeneity. Simply put, empirical evidences are quite mixed in this literature. This chapter aims to present the sources of these heterogeneities providing a synopsis of the empirical literature on labor demand elasticities regarding to international trade and closely related other two aspects of globalization, namely outsourcing and nationality of ownership for firms. To do this, we divide this chapter into three subchapters dealing the relationships of labor demand elasticities with international trade, international outsourcing, and nationality of ownership, respectively.

The ways and directions of behavioral adoptions by individuals and firms to the changes in policies are the questions most interested in empirical literature of labor economics. In this respect, since the effectiveness of labor market policies depends on the labor demand reactions of firms to the wage changes, the parameters for firms' wage elasticities of labor demand are of crucial interest. Moreover, the analytical considerations about the structural changes in production that are sourced from skill-biased technological (SBTC) or organizational changes use the own- and cross-wage elasticities of labor demand for differently-skilled labor as key parameters. For the debates about the effectiveness and extent of minimum wages, economists also utilize from these parameters. Additionally, most of the studies dealing with labor demand mainly focus on the substitutability between differently skilled labor and capital, on substitutability between different types of labor and on the effects of progress on labor demand where this progress may be technological, innovational or organizational.

Labor demand elasticities are also used in many other fields of economics besides labor economics. These fields are emphasized at length in Lichter et al. (2014). Accordingly, public finance uses these elasticities in the optimal tax models of

individuals and firms (Jacquet et al., 2012; Riedel, 2011). Deadweight losses of taxation are also assessed with them. In the theoretical models of international trade, the wage elasticity of labor demand plays an important role as a parameter (Rauch and Trindade, 2003). On the other hand, as our main aim in that dissertation study, the wage elasticity of labor demand contributes as an indicator when evaluating the effects of globalization on the volatility of employment and wages (Rodrik, 1997). Moreover, calibrations with macro and computable general equilibrium (CGE) models use the estimates of the wage elasticity of labor demand (Boeters and Savard, 2013).

The huge number of studies dedicated to the estimation of wage elasticities of labor demand gives a clue about the importance of this parameter. However, there is no consensus on the true value of this parameter in the literature. Lichter et al. (2014) summarize the sources of this heterogeneity for wage elasticity of labor demand in their comprehensive study and lists the possible reasons behind them. Accordingly, the consistency with respect to the theory (total vs. constant-output elasticities), the timing (short- vs. intermediate- vs. long-run elasticities), the researcher's empirical specification of the labor demand, the choice of the empirical model, whether to instrument the wage variable, different sources of data (administrative vs. survey), different types of data (panel vs. cross-sectional and time-series), the observational level (industry- vs. firm-level) of the datasets are listed for the potential sources of the heterogeneities in the estimates.[61] Additionally, according to the authors, worker and industry characteristics such as firms' demand for unskilled labor or workers with atypical contracts might lead to more elasticity than the demand for high-skilled labor. Besides, more labor intensive sectors may cause to differentiation in the elasticities. They also mention about the role of time as accelerating globalization and technological changes may alter labor demand elasticities. Lastly, they highlight the importance of labor market institutions on the firm behavior and its labor demand decisions, so the own-wage elasticities of labor demand are expected to change across countries, even across the regions in a given country (Lichter et al., 2014). These points are also

[61] Lichter et al. (2014) concludes that more than 80% of the variation in the estimates of labor demand elasticities is sourced from the theoretical and empirical specifications of labor demand model, different datasets used or sectors and countries considered.

investigated during our survey of empirical literature and summarized for each study in the remainder of this chapter.

Lichter et al. (2014) also highlight the importance of publication selection (or reporting) bias in that heterogeneity of estimates. They argue that journals prefer to publish statistically significant results (DeLong and Lang, 1992) and beliefs in some particular economic relationships might push researchers to select and referees and editors to publish expected empirical results (Card and Krueger, 1995). In terms of labor demand, there is a stable belief in a negative relationship between real wages and labor demand, and thus leads to negative own-wage elasticity of labor demand. The seminal work of Hamermesh (1993) has shaped this belief. He reviewed the earlier empirical literature of labor demand from many studies covering especially industrialized countries and concluded that the value of the constant-output own-wage elasticity of labor demand is in the interval between 0.15 and 0.75, with his best guess being 0.30.[62] Therefore researchers are likely inclined to report negative and statistically significant elasticities considering this well-known interval of Hamermesh (1993).

In the remainder of this chapter, we summarize the studies which investigate the relationship between the own-wage elasticities of labor demand and international trade. Besides, international outsourcing and the multinationalization of production process contributes new aspects to the discussions between globalization and labor demand elasticities. So, the following subchapters aim to document these studies that deal with these discussions.

4.1. International Trade and Labor Demand Elasticities

One of possible channels through which globalization influences labor market is the effect on the labor demand elasticity. Dani Rodrik, in his inspiring book “Has globalization gone too far?” (1997), is among the first scholars to emphasize the linkage between trade openness (or international economic integration in a broader context) and labor demand elasticity and he suggests that a higher responsiveness of labor demand to the changes in labor costs might be a direct result of international economic integration

[62] In a recent study Hamermesh (2014) refers this best guess as "3 for 10" rule.

"*regardless of economic structure and the identity of the trade partners*" (Rodrik, 1997, p. 26).

As we mentioned in the theoretical background chapter, the total own-price labor demand elasticity is composed of two parts: 1) the scale effect, which explains the employment change due to the wage-induced change in the output; and 2) the substitution effect, which explains the employment change due to substitution with other production factors for constant output. Considering this context, theoretically, international trade may affect the total labor demand elasticity by the scale effect due to the increased competition on the product market and/or by the substitution effect generated by altering the firm production possibility set to include new foreign and domestic intermediate inputs, or to increase the efficiency of the existing ones. However, it should be kept in mind that this is valid only in a partial equilibrium context.[63] Panagariya (1999) is the first scholar proves this proposition.

Panagariya (1999) refers to Leamer (1995), Rodrik (1997) and Wood (1995) as who suggests the demand-for-labor curve is more elastic when an economy is open than when it is closed, but Panagariya argues that this proposition is not valid in general equilibrium context. According to the author, this proposition may be violated in both the 2x2 and specific-factors models. Furthermore, Panagariya (1999) argues that the results obtained by Rodrik (1997) fail to hold in general equilibrium context when the full structure of the model is illustrated. Thus, within two most popular models of international trade – 2x2 and specific-factors-model - Panagariya argues that it is not certain that openness causes a greater incidence of higher labor standards being borne by workers or to greater volatility in wage earnings as a consequence of exogenous shocks to the economy. Panagariya (1999) also states that it is not true in general that when trade openness lowers the bargaining power of workers, it contributes negatively to wages. Additionally, he states that in the 2x2 model, the opposite may happen. Therefore, theoretically, Panagariya (1999) demonstrates that the Rodrik's conjecture of a positive effect of globalization on labor demand elasticity should not be considered as a universal result. So, the validity of this hypothesis should be determined empirically

[63] This mentioned effect of international trade on labor demand curve is on its slope. However, international trade may also directly affect domestic labor demand as a shifter.

for different cases. However, the findings of empirical literature on this subject are inconclusive. In the remainder of this subchapter, we sizably summarize the empirical evidences for the Rodrik's (1997) hypothesis tested within some core empirical studies from various country cases, from both developed and developing countries, following an order of chronological and context specific.

The first and seminal paper that provides a very systematic and rigorous empirical investigation of the impact of the hypothesized positive effect of trade on labor demand elasticities pertains to Slaughter (2001). Slaughter (2001) attempts to determine whether international trade has been increasing the own-price elasticity of demand for U.S. labor. His two-stage empirical work gives three main results. In the first stage, he finds that from 1961 through 1991 demand for U.S. production labor became more elastic in manufacturing overall and in five of eight industries within the manufacturing sector. However during this time U.S. non-production labor demand did not become more elastic in manufacturing sector overall or in any of the eight industries within the manufacturing sector. In the second stage, he regress estimated elasticities on a set of trade variables and includes industry dummies. Although Slaughter finds many significant coefficients with expected signs, he states that the hypothesis that trade contributed to increased elasticities has mixed support, because, at this point, Slaughter (2001) emphasizes the role of time as a strong predictor of elasticity patterns. That means there is a large unexplained residual for changing factor demand elasticities.

Jean (2000) studies the effect of international trade on the own-wage elasticity of aggregate labor demand on the idea that a change in the cost of labor has an impact on the sectoral trade specialization of an economy, at the expense of the domestic productions using this factor intensively, even when the international trade balance is kept unchanged. Shortly, this is a focus on the intersectoral dimension of the scale effect. Jean (2000) argues that trade openness leads to an increase in the associated labor-demand elasticity, at least if the country has a comparative disadvantage in the industries using intensively the type of labor considered. He illustrates this argument by a simple model, based on an Armington hypothesis, with an empirical assessment for

France. Jean (2000) shows that, for France, trade openness can have a significant effect on labor demand elasticities with this mechanism.

Krishna et al. (2001) test the idea that trade liberalization will cause an increase in labor-demand elasticities using Turkish plant-level data spanning the course of trade liberalization process in Turkey. They estimate a labor demand equation in which wage variable is interacted with trade liberalization dummy to capture the effects of changes in trade policy. However, they cannot find any empirical support for this supposed theoretical link. In most of the industries they consider, they cannot reject the hypothesis of no relationship between trade openness and labor-demand elasticities.

Bruno et al. (2004) is another early study which emphasizes the impact of globalization on the labor demand elasticity as a channel through which globalization affects the labor markets of some OECD countries. They suggest that international trade lead to an increase in the labor demand elasticity via a scale effect due to the increased competition on the output market and/or via a substitution effect generated by expanding the firm production possibility set to include additional inputs. However, their focus is centered on the latter of transmission. They get a labor demand equation from the solution of a firm's cost minimization problem. Empirically, they estimated the labor demand using a panel from a number of industrialized countries, including some major EU countries, Japan and the U.S. for the period between 1970 and 1996. As a result, they do not find any significant substitution effect of trade on labor demand elasticity, except France.

Kizilirmak and Sahin (2003) attempt to estimate labor demand elasticities of both production and non-production workers and their relations with openness in the Turkish manufacturing industries. For these purposes, they estimate dynamic labor demand functions using Arellano-Bond dynamic panel data estimator. They use annual panel data at 4-digit industry level that span the years 1988-1998 in estimations. Their results, the signs and sizes of the estimated elasticities are consistent with the literature.

Using industry level data disaggregated by states, Hasan et al. (2003) finds a positive impact of trade liberalization on labor-demand elasticities for the Indian

manufacturing sector. In addition to that, they indicate that these elasticities turn out to be negatively linked to protection levels that vary across industries and over time. Furthermore, they find that these elasticities are not only higher for Indian states with more flexible labor regulations; they are also affected by trade reforms. Finally, they find that volatility in productivity and production reflected into larger wage and employment volatilities after the reforms. They think that this is a theoretically possible consequence of larger labor-demand elasticities.

Haouas and Yagoubi (2004) explore the effects of trade liberalization on labor demand elasticities for the Tunisian case. They estimate labor demand equations using data for the years between 1971 and 1996 for manufacturing industries in Tunisia. According to their results, they find a weak support for the idea assuming that trade liberalization will cause an increase in labor demand elasticities. In most of the industries they consider, they cannot reject the hypothesis of no relationship between trade openness and labor-demand elasticities. Authors explain this weakness of labor demand elasticity by the tight labor market regulations in Tunisia during the years 1987-1996. Additionally, they indicate that their results are robust to the type of labor considered (contract labor and permanent labor), and they argue that this supports the conclusion that labor markets have become more flexible in liberalization periods, and that employers prefer employing contract workers.

Riihimäki (2005) investigates the impacts of the economic integration on the own-price elasticity of labor demand for the case of Finland. In a general theoretical model of intra-industry trade, author analyzes how economic integration alters the labor demand elasticity. She shows that intensified trade competition raises the labor-demand elasticity, whereas better advantage with economies of scale reduces the labor demand elasticity by decreasing elasticity of substitution between differentiated products. Riihimäki (2005) particularly tests the idea whether European integration has altered the labor demand elasticities in Finland using data from the manufacturing sector for the period between 1975 and 2002. Empirical findings of that study provide evidence for the hypothesis that economic integration has contributed to increased elasticities of total labor demand.

Bruno et al. (2005) estimate a dynamic labor demand equation using a small unbalanced panel data set of Italian manufacturing sectors. Their estimated long-run and short-run labor demand elasticities are parallel with the interval indicated in Hamermesh (1993). Additionally, they find that the magnitudes of these elasticities are not positively affected by measures of sectoral international exposure. They interpret this evidence as a rejection of the Rodrik's (1997) hypothesis for Italy case.

Fajnzylber and Maloney (2005) readdress the opinion that trade liberalization result in higher own-wage elasticities of labor demand, particularly for unskilled labor, considering negative implications for both labor market volatility and wage distribution. However, they argue that theoretically the link between liberalization and labor-demand elasticities is less clear than has previously been asserted. Then they use dynamic panel techniques to estimate labor-demand functions for manufacturing establishments in Chile, Colombia, and Mexico across periods of trade policy reforms. Their results do not strongly support the hypothesis that trade liberalization has a direct impact on own-wage elasticities, there appears only very mixed support and no consistent patterns.

Akhter and Ali (2007) explore the linkage between trade liberalization and labor demand elasticities for the Pakistan case. They use Pakistan firm-level data and try to determine whether the trade liberalization increase the own price labor demand elasticities in the manufacturing sector. To that end, they calculate elasticities for production and non-production workers for major eleven industries at individual level and then they calculate the elasticities by pooling data across the industries at aggregate level. They conclude that trade liberalization has neither positive nor negative impact on labor demand in the manufacturing sector of Pakistan.

Goldar (2009) tests the hypothesis that trade liberalization raises labor demand elasticity for Indian industries using Annual Survey of Industries data for 1980-81 to 1997-98, and analyzes the trends in the elasticity using data for 1973-74 to 2003-04. Econometric results of Goldar (2009) corroborate the findings of a similar study undertaken by Hasan et al. (2003), and indicate that trade liberalization has a positive effect on the labor demand elasticity in Indian industries. However, Goldar (2009) finds that the estimated elasticity for the post-reform period is lower than that for the pre-

reform period. The closer examinations of author show that a downward trend in the labor demand elasticity in Indian industries in the pre-reform period reversed after the mid-1990s. Author attributes the increase in the elasticity after the mid-1990s to trade liberalization and he also adds that other factors such as weakening of trade union power may have also contributed to that increase.

Rich (2010) provides a relationship between long-standing labor demand elasticity estimates in the U.S. manufacturing and recent studies of wage trends and labor demand changes in response to technical change and international trade. He finds asymmetric changes in labor demand elasticities including an absolute and relative increase in own-wage elasticity of labor demand for production workers. According to his separate estimates for substitution and scale responses imply that skill-biased technical change (SBTC) dominates increased product market competition as a source of the observed changes in labor demand elasticity.

Yasmin and Khan (2011) investigate trade-labor market linkages in Pakistan. The main hypothesis that trade liberalization leads to an increase in labor demand elasticity is empirically supported using a panel data approach for the period 1970/71-2000/01 for 22 selected manufacturing industries in Pakistan. They use ordinary least squares (OLS) to estimate models in levels and first-differences, in addition to a fixed effects model. Overall, their findings suggest weak evidence of increased labor demand elasticity as a result of trade liberalization in Pakistan's manufacturing sector.

Nazier (2013) aims to investigate the impact of trade liberalization on the labor market in Egypt and attempts to empirically examine the effect of the Egyptian trade reforms, initiated in 1991, on labor demand elasticities in the Egyptian manufacturing sector, using a panel data approach for the years from 1989-90 to 2009-2010. According to the empirical findings of Nazier (2013), the Egyptian case does not support the theoretical hypothesis that total labor demand elasticities increase with trade openness.

Mouelhi and Ghazali (2012) divides labor input into skilled and unskilled categories in order to analyze the effects of trade policies on labor demand elasticities by skill in Tunisia. They use dynamic panel techniques to estimate a model for the

determination of labor demand, which incorporates the effects of international trade and takes into account the delay of labor adjustment. Their dataset covers 529 Tunisian firms from 6 manufacturing sectors over the period 1997-2002. Their results suggest that a decrease in trade protection in Tunisia increases the elasticity of unskilled labor demand while it contributes to the decrease in the elasticity of skilled labor demand.

Wei et al. (2012) analyze the effect of services trade on the labor-demand elasticities of service sector with the data of China from 1982 to 2009. They find that China's services export plainly affects the labor demand elasticities of service sector. However, they note that in the long run, they cannot reject the hypothesis of no relationship between service import openness and the labor demand elasticities of service sector. Whereas, for the short term, they state that trade liberalization of services import have an impact on the service sector labor demand elasticity weakly.

Njikam (2013) investigates the impact of trade and foreign direct investment (FDI) on labor adjustment and labor demand elasticities in Cameroonian manufacturing sector. Njikam (2013) finds that trade openness leads to faster adjustment of different labor inputs with a higher speed for unskilled workers using firm-level data pooled across sectors. However, author concludes that tariff liberalization does not have any statistically significant effects on labor-demand elasticities. But Nazier (2013) finds strong evidence for the impact of imports on skilled-labor-demand elasticity when tariffs are replaced with import-penetration ratios. This paper also finds strong evidence that FDI inflows strongly increase unskilled-labor-demand elasticity.

Lichter et al. (2013) reemphasize the hypothesis of Rodrik (1997) which argues that globalization increases the volatility of employment and decreases the bargaining power of workers. They argue that long-standing Hicks-Marshall law of derived demand is an important mechanism explaining this relationship: with international trade increasing competition and therefore the price elasticity of product demand, exporters are predicted to have higher labor demand elasticities. They test this relationship empirically by analyzing the effects of exporting on firms' labor demand. Their results show that exporting has a positive and significant effect on the own-wage elasticity of unconditional labor demand, due to higher price elasticities of product demand.

Mahomedy (2013) uses an industry-level panel dataset covering the South African manufacturing sector spanning a period of over three decades to empirically test the relationship between trade openness and labor demand elasticities. Mahomedy (2013) finds only limited empirical support for the hypothesis of a positive and significant impact of trade liberalization on labor demand elasticities. He finds that labor demand become more elastic for manufacturing overall and in one of ten sectors within manufacturing, this result do not hold for any of the other industries examined by author.

Cherkashin (2013) asks whether a greater degree of integration into world markets lead to a more elastic labor demand that is referred to the Rodrik (1997) hypothesis. He investigates this hypothesis by using a unique firm-level panel data set for Russian manufacturing firms during a period of significant and rapid currency devaluation. Since this devaluation made imports of final and intermediate goods more expensive while making Russian exports less expensive, it was like a tariff on imports and a subsidy on exports. Then with a simple but revealing model, he specifies the implications of devaluation for the labor demand and derives a set of testable predictions. Using the data to test these predictions, Cherkashin (2013) shows that trade barriers affect labor demand elasticities. According to the results of the study, 15-30% drop in labor demand elasticity can be attributed to the devaluation.

Sato and Zhu (2014) examine the effects of input and output tariff reductions on labor demand elasticities at the firm level. For this purpose, they consider a heterogeneous firm model in which firms are allowed to export their products and to use imported intermediate inputs. The model they used predicts that only productive firms can use imported intermediate inputs and tend to have larger constant-output labor demand elasticities. Additionally, they state that input tariff reductions would lower the factor shares of labor for these productive firms and increase conditional labor demand elasticities further. They test these empirical predictions, constructing Chinese firm-level panel data over the 2000-2006 period and controlling for potential tariff endogeneity by instruments. Their empirical results generally support these predictions.

Overall, we may argue that the literature exploring the linkage between labor demand elasticity and international trade does not seem to settle on a common view about the validity of Rodrik's (1997) hypothesis. Each country case gives different results depending on its idiosyncratic characteristics. These characteristics are strongly linked to the extent of internationalization and to the dynamics of domestic labor market for each country. Ultimately, factors behind this differentiation are rooted in micro units, particularly in firms. Their production technologies and organizations shape both their international trade and employment relationships. International outsourcing is one of the prominent ways which alter these relationships for firms. In this context, next subchapter presents the studies considering the role of international outsourcing on the labor demand and labor demand elasticities.

4.2. Outsourcing and Labor Demand

During the past few decades, national economies have become much more integrated into the world economy through increased openness to international trade and intense capital flows. In parallel with that development, many countries have removed policies that restrict foreign investment and have initiated offering better infrastructure and investment incentives aimed at stimulating foreign capital inflows. This period is characterized by increased global production and vertical specialization of countries thanks to the improvements in technology (especially in IT technology) that decreased transportation and monitoring costs. However, during this period, mobility of goods and capital has remained significantly higher than that of labor (Rodrik, 1997). Therefore, understanding the implications of these new aspects of globalization on domestic labor markets is an important issue and has some crucial policy implications.

International outsourcing differs importantly from import penetration in final goods because it explicitly takes into account the extent to which firms shift production activities abroad. Moreover, labor demand is not only affected in import-competing industries, but in all industries that use foreign inputs.[64] Hence, the effects of outsourcing may not be constrained with changing labor demands between industries,

[64] As an outcome of the vertical disintegration of production, intermediate imports increased much faster than final goods particularly in high skilled manufacturing (Onaran, 2008).

but also it affects the relative demand for labor within industries (Hijzen et al., 2005). Therefore, we expect that outsourcing also alter the labor demand elasticities.

4.2.1. Outsourcing, Wages and Employment

In this last decade, with growing globalization, international outsourcing,[65] which is understood as buying of production parts from an independent foreign supplier, has become an important part in firms' management to reorganize the production process.[66] The expansion of international outsourcing is likely to have considerable effects on employment and wages. The term international outsourcing has been a widely discussed topic of public debates and academic research in developed countries, especially in the U.S. and E.U. in recent periods. There are serious public concerns about alleged adverse consequences of increasing outsourcing activities in these developed countries with high unemployment rates (Koskela and Schob, 2008). Increased international outsourcing is often blamed for deteriorating domestic employment level/security and this view is supported largely by anecdotal evidences. Many economists also point at the various results of outsourcing for domestic labor markets, especially for unskilled or low-skilled labor groups. In consequence of movement of low-skilled intensive production stages to developing countries where low-skilled labor is relatively abundant, the possibility of substitution between cheaper foreign unskilled labor and relatively more costly domestic unskilled labor reveals. Hence, relative demand for low-skilled labor decreases and for high-skilled labor increases in domestic labor markets of developed countries.[67] This increased possibility of substituting foreign labor for domestic through offshoring (trade in intermediate

[65] There are various terms to describe the same phenomenon. Amongst others, "kaleidoscope comparative advantage" (Bhagwati and Dehejia, 1994), "slicing the value-chain" (Krugman, 1995a), "vertical specialization" (Hummels et al., 2001), "vertical trade" (Jones, 1996), "delocalization" (Leamer, 1998), "fragmentation" (Jones and Kierzkowski, 2001) are also used in the literature. Throughout this dissertation the term "outsourcing" (outside resource using) is preferred.

[66] Some empirical studies show the increase of imported intermediate inputs over the last three decades (see Campa and Goldberg, 1997; Hummels et al. 1998, 2001; Feenstra and Hanson, 2001; Yeats, 2001; Grossman and Helpman, 2002).

[67] The poor employment performance for low skilled labor could also be due to the adoption of new technologies which are labor saving.

inputs) is also likely to flatten the labor demand curve (Şenses, 2010). Such consequences may imply the loss of employment and/or a reduction of the wage level.[68]

On the other hand, some economists argue that the ability to use foreign intermediate inputs may lower firms' production costs and raise their productivity.[69] Moreover, this may allow these firms to expand output, employment and raise wages. Shortly, they argue that a firm may enjoy increased productivity, outsourcing, output, and wage simultaneously. In a similar vein, some studies also argue that outsourcing may be beneficial for domestic jobs when foreign jobs are complements to domestic jobs.[70]

Therefore, the answer to the question that how has outsourcing affected workers' wage and employment opportunities is not obvious theoretically.[71] While the substitution effect of hiring cheaper foreign labor may be negative for domestic employment, the total effect is ambiguous (Bandyopadhyay et al., 2010). This dispute actually emphasizes that the net effect depends on whether imports are substitute or complementary to domestic production (Davis and Mishra, 2007). If imported goods are not the substitutes of domestic goods, but if they are complementary intermediate input goods, or if they are final goods that are not being produced in domestic markets, the negative effects are not expected to be observed, or even positive effects are possible. For instance, imports of final goods from the less developed countries do not necessarily substitute domestic labor in a developed country. However, as it is argued in the literature, the possibility of negative substitution effect with intermediate imports is high (Feenstra and Hanson, 1997). This is because intermediate imports may decrease the production costs of the firm and increase total output. Thus creates a positive scale effect (Grossman and Rossi-Hansberg, 2006). So, even if the international outsourcing decreases labor demand for a given level of value added through the scale effect, the demand for labor increases. Therefore, the overall effect depends on the negative

[68] For the debate on employment effects of outsourcing, see Freeman (1995) and Bhagwati et al. (2004).
[69] See Amiti and Konings (2007), Kasahara and Rodrigue (2007), Grossman and Rossi-Hansberg (2006), Görg et al. (2008).
[70] See Skaksen and Sorensen (2001) for a theoretical treatment and Leahy and Montagna (2000) for empirical evidence.
[71] See Jones and Kierzkowski (2001) and Kohler (2004) to see how it is not clear in a general equilibrium setting.

substitution effect vs. positive scale effects. This again implies that, not surprisingly, economic debates on this subject are mostly on the empirical ground.

The existing empirical literature which investigates the labor market responses to outsourcing is generally divided into two main strands. While some studies focus on the short-run employment effects of outsourcing, other studies emphasize the role of outsourcing on the wage dispersion between different skilled labor groups in the long-run.

4.2.2. Employment Effects of Outsourcing (Short-Run & Medium-Run Effects)

One common theme running through the standard trade theoretic models based on Heckscher-Ohlin (HO) or specific factors assumptions which are an investigation of how international outsourcing is predicted to change the composition of skilled and unskilled labor in a given country (Arndt, 1997, 1999; Deardorff, 2000, 2001; Egger and Egger, 2003; Jones and Kierzkowski, 2001; Kohler, 2001). These theoretical contributions have highlighted the importance of international outsourcing for determining labor demand for different skill groups. However, the theoretical literature does not reach a consensus on the labor market effects of international outsourcing. International outsourcing may raise or lower relative demand for low-skilled workers depending on the assumptions and framework of the models. One side of this literature based on the empirical evidence using aggregate data (Feenstra and Hanson, 1996, 1999; Geishecker, 2002; Hijzen, Görg, and Hine, 2005; Hsieh and Woo, 2005; Egger and Egger, 2003, 2005; Hijzen, 2007) show that a skill upgrading (intensity) occurs in industrial countries by outsourcing.[72] Head and Ries (2002) is a good example to this upgrade (skill intensity) argument that use Japanese firm-level data to look at the effect of international outsourcing on relative labor demand at the level of the plant.[73] They explore the effects of offshore production by Japanese multinationals on domestic skill intensity. They find that Japanese firms increasing additional employment with foreign affiliates in low-income countries raises skill intensity of employment in their

[72] See Mullen and Panning (2009) for an analysis with disaggregated data.
[73] See Yamashita (2007) for a recent study about skill upgrading in the Japanese manufacturing industry. Ahn et al. (2008) also find a skill upgrading effect for the Korean electrical machinery sector.

headquarters. Moreover, they argue that increases in affiliate employment in low-income countries raise a firm's dependence on finished goods purchases, proposing that overseas employment affects domestic skill intensity because imports of final goods from foreign affiliates displace domestic production.

Furthermore, these neoclassical models abovementioned, assume that labor market adjustments are achieved by flexible wages and so they predict that there should be no employment effects in the long-run at the aggregate level. Although this may be the case in the long run, wages might be rigid in the medium and short run. If this proposition is true, then labor market adjustments to international outsourcing have to be achieved by changes in employment (Krugman, 1995a). Moreover, these models generally ignore the adjustment costs, thus labor can move between different sectors of economic activity in response to international sourcing with no cost. However, as Davidson and Matusz (2004) show that short-run adjustment costs can reduce a significant part of the gains from international trade. Therefore, since the redistributional short-run effects can be harmful, it is crucial to focus on the impact of international outsourcing on the short run labor markets dynamics. But for some economists, workers displaced by trade represent only a small share of total labor turnover and the labor market adjustment difficulties that they encounter appear to similar to those experienced by other job losers (Kletzer, 2002; OECD, 2005).

In order to investigate the short-run dynamics, some researchers have focused on intra-sectoral worker flows that arise as a consequence of outsourcing domestic production (Egger, Pfaffermayr and Weber, 2003; Kletzer, 2000). Egger et al. (2003) use individual-level panel data from Austria to explore the consequences of increased international outsourcing for labor. They indicate that full labor adjustment in response to outsourcing may be a long-run objective but the immediate effects of outsourcing may lead to unemployment in the short-run. This is mostly because people cannot immediately switch into alternative employment opportunities. The persistence with this unemployment necessitates investigating short-run transition probabilities where individuals can move into and out of employment and between different sectors.

Accordingly, Egger et al. (2003) explore the effects of trade on employment using a worker flow framework similar to that initiated by Kletzer (2000) which takes short-run employment changes into account. They analyze the effects of several factors on individual transition probabilities between size and different states of employment and unemployment. These factors include growth changes of imported goods, exports, outsourcing, and technical change. Thanks to the longitudinal and highly disaggregated nature of the data, they can model transition probabilities between different employment stages. As a result, they find that international outsourcing decreases worker flow to the sectors in which the economy has a comparative disadvantage (CDA), but net changes to the comparative advantage sectors (CA) of the economy do not change. These empirical results suggest that net unemployment increases. This is because reduction in the likelihood that workers shift to the CDA sector is not covered by a proportionate inflow of workers to the CA sector. Kletzer (2000) also finds that U.S. outsourcing cause net job losses.

Görg and Hanley (2005) is another study that examines empirically the effect of international outsourcing on labor demand at the level of the individual plant for the Irish electronics sector. They estimate a dynamic model of plant-level labor demand, using a Generalized Method of Moments (GMM) estimator. According to their findings, there are significant reductions in plant-level labor demand in the short-run. They attribute this finding to the use of international outsourcing. Besides, they conclude that there appears to be stronger negative effects with outsourcing of materials than from services outsourcing. OECD (2007) also finds that material offshoring has a negative effect on the demand for all skill groups, but the estimated effect is quite larger for low skilled workers.

Geishecker (2008) analyzes how international outsourcing affected individual employment security and finds that international outsourcing significantly lowers individual employment security. And he notes that the effect does not differ between high-, medium-, and low-skilled workers but only varies with job duration.[74] However, Bachmann and Braun (2008) argue that outsourcing has no significant effect on overall

[74] See Anderson and Gascon (2008) for another study.

job stability in the manufacturing sector, and is associated with increased job stability in the service sector. Moreover, they find that the effect of outsourcing varies strongly across skill levels and age groups, with negative effects for some workers. On the contrary, Becker and Muendler (2008) find that expansion of employment abroad of a German multinational firm increases job security at home.

4.2.3. Wage Differential between High and Low Skilled Labor (Long-Run Effects)

Previous researches on labor market effects of international trade generally focus on the change in the skill premium observed in the U.S. and other developed countries.[75] Some researchers have seen the international trade as an important explanation for the increase in the wage gap in industrial countries. These studies heavily focused on the trade with developing economies based on the Heckscher-Ohlin model and the Stolper-Samuelson theorem. But other studies argued that, as concerns long-run effects, globalization appears to have been one of the factors tending to depress the relative wages of low-skilled workers, but to have played a relatively limited role in the overall increase in earnings inequality during the past several decades (Slaughter, 2000; Feenstra, 2007). So, most of these studies have argued that trade in final goods explains only a small portion of increased wage inequality. Krugman (1995b) argues that this result is not surprising, since the trade with developing countries represents a very small portion of all trade. Although the debate still continues, many researchers see skill biased technological change (SBTC) as the culprit; this is mainly because other factors such as trade and the decline of unions fail to explain the extent of the observed wage inequality. However, recent studies emphasize the role of outsourcing and trade in intermediate inputs for the explanation of rising wage differentials in developed economies, like U.S.[76]

[75] See Gaston and Trefler (1994), Berman et al. (1994), Autor et al. (1998) among others. Harrison and Hanson (1999), Feenstra and Hanson (2001), Goldberg and Pavnick (2004, 2007), Harrison and McMillan (2007) presents comprehensive literature surveys on trade and wages.

[76] See Arndt (1997, 1998a,b), Deardorff (2001), Egger (2002), Jones (2000) and Jones and Kierzkowski (1990, 2001) for an analysis in the Hecksher-Ohlin framework. See Kroeger (2013) for a recent study.

Then the issue has attracted most attention by many studies thus far is whether offshoring (trade in intermediate inputs) has contributed to a shift in labor demand for different types of workers and consequently a change in the wage differential between high and low skilled labor.[77]

The arguments of these studies rest on the idea that an increasing amount of international trade takes the form of trade in intermediate inputs. This is called "product sharing" or "outsourcing."[78] This type of trade influences labor demand in import-competing industries, but also has effects on labor demand in the industries using the inputs. Because of this reason, these economists argue that trade in intermediate inputs can have an impact on wages and employment that is much greater than for trade in final consumer goods (Krugman, 1995a; Feenstra and Hanson, 2001). Moreover, the debate still continues but many economists argues that skill biased technical change and offshoring are the two main factors contributing to the rise in observed wage gap and they believe that trade in inputs has much the same impact on labor demand as does skill-biased technical change:[79] both of these will shift demand away from low-skilled activities, while increasing relative demand and wages of the higher skilled.[80] So, identifying whether the changes in wages is sourced due to international trade, or technological change, is fundamentally an empirical rather a theoretical question (Feenstra and Hanson, 2001). And other potential explanations such as trade in final goods, immigration and the decline of unions fail to explain the extent of the wage gap.

Feenstra and Hanson (1996, 1997, and 1999) provide probably the most prominent examples of empirical work on this issue. They investigate the impact of international outsourcing on relative demand and wage differentials between workers of different skill levels using industry-level data for the U.S. They note that the two most widely cited explanations for rises in wage inequalities are skill-biased change and trade with low-wage countries. The latter is conductive to outsourcing in the vertical chain of

[77] e.g. Egger and Egger (2003), Feenstra and Hanson (1999), Hijzen, Görg and Hine (2005)
[78] See Jones and Kierzkowski (1990), Arndt (1998b) and Deardorff (2000, 2001) for a detailed definition of international outsourcing.
[79] As Feenstra (1998, p.41) points out, "outsourcing has a qualitatively similar effect on reducing the demand for unskilled relative to skilled labor within an industry as does skill-biased technological change."
[80] See the discussion in Egger and Falkinger (2001).

production. As an outcome of the vertical disintegration of production, intermediate imports increased much faster than final goods. And they concluded that outsourcing is a major and significant driving factor behind the wage differentials. Following Feenstra and Hanson's works, similar evidence has been produced for a number of European countries, e.g., Hijzen et al. (2005) for the U.K., Falk and Koebel (2002) and Geishecker (2002) for Germany, Strauss-Kahn (2003) for France, Ekholm and Hakkala (2006) for Sweden and Egger and Egger (2003) for Austria.

4.2.4. Outsourcing and Labor Demand Elasticities

Rodrik (1997) describes labor demand elasticities as an important channel through which international trade affects labor markets (Şenses, 2010). His argument is that increase in product market competition with the decline in trade protection and the entry of less developed economies into the manufacturing sector, should increase labor demand elasticities. As it is abovementioned the increased possibility of substituting foreign labor for domestic through outsourcing is likely to flatten the labor demand curve (Şenses, 2010). Rodrik (1997) also highlights that outsourcing could affect labor markets even though the share of outsourcing is not so much in most industries. Moreover, even if real levels of outsourcing do not change, he argues that an increase in threat of outsourcing can make labor demand more elastic.

The literature about the effects of international trade on labor demand elasticities has mainly focused on developing economies during their trade liberalization periods.[81]

Increased labor demand elasticities have crucial labor market implications, and it is important to emphasize the significance of this channel. First, increased labor demand elasticity changes the incidence of non-wage labor costs, such as payroll taxes or improved working conditions. Greater responsiveness of employers to wage changes increases workers' share of such costs. Second, higher elasticities lead to larger instabilities in the labor market. Labor productivity changes may cause shocks to labor demand and if the labor demand is more elastic, this will result with volatility of

[81] Krishna et al. (2001), Fajnzylber and Maloney (2000a, 2000b) and Hasan et al. (2003) are some examples summarized in the first subchapter.

employment and wages.[82] Third, higher elasticities give rise to the deteriorations in the bargaining power of labor, weaken unions and decrease the labor's share of industry rents (Rodrik, 1997).

A large number of studies have explicitly analyzed the impact of globalization on the elasticity of labor demand, but the evidence is rather mixed (Hijzen and Swaim, 2008).[83] But the studies specifically investigating international outsourcing and labor demand elasticities together are so limited in the literature.

OECD (2007) is one of the early studies finds that wage elasticity of labor demand increased during 1980-2002 due to offshoring.

Hijzen and Swaim (2008) is another study analyzes the evolution of the elasticity of labor demand and the role of offshoring therein using industry-level data for a large number of OECD countries. Their first major finding is that wage elasticity of labor demand has increased substantially. Their second finding is that more intensive offshoring is related with more elastic labor demand. They suggests that this finding is consistent with the idea which increased offshoring having expanded the flexibility of firms to adjust the contribution of domestic workers and foreign value-added in production process when relative factor prices alter. According to their counter-factual analysis, the average elasticity of labor demand is about 30% to 40% larger in absolute value than the counter-factual elasticity which would have prevailed had offshoring not been possible. They interpret these increases in labor demand elasticities as important signals for job insecurity and lower bargaining power. Moreover, they find some evidence that strict employment protection legislation reduce the power of relationship between offshoring and higher labor demand elasticity. To the authors, this shows that the effect of offshoring on labor demand elasticity depends on the national institutions.

Şenses (2010) is an important study in the literature that focuses on the effects of outsourcing on conditional labor demand elasticities. She develops a model of

[82] Slaughter (2001) notes that the distribution of volatility between wages and employment depends on the slope of the labor-supply schedule. If labor supply is perfectly inelastic (elastic) then labor-demand shocks trigger only wage (employment) volatility.
[83] See Slaughter (2001), Bruno et al. (2004), Molnar et al. (2007).

outsourcing that formalizes this relationship. She shows that the increased possibility of outsourcing (modeled as a decline in foreign intermediate input prices and an increase in the elasticity of substitution between foreign and domestic intermediate inputs) should increase labor demand elasticities. She also shows that, a decline in the share of unskilled labor, due either to skill biased technological change or to movement of unskilled labor intensive stages abroad, can work in the opposite direction and reverse the increasing trend in elasticities. She then tests the predictions of her model using the U.S. Census Bureau's Longitudinal Research Database (LRD) and employing the instrumental variable approach in estimation of labor demand equations. She directly addresses the endogeneity of wages in the labor demand equation by using average non-manufacturing wages for each location and year as an instrumental variable for the plant-level wages in the manufacturing sector. The results found in this study support the main predictions of the model. U.S. manufacturing plants operating in industries that heavily outsource experienced an increase in their conditional labor demand elasticities during the 1980-1992 period. After 1992 elasticities began to decrease in outsourcing industries. According to author, these results are consistent with the model which suggests that a decline in the share of unskilled labor in total cost could result in such a decrease in labor demand elasticities, precisely when the level of outsourcing is high. Estimates of Senses (2010) at the two-digit industry level provide further evidence corroborating the hypothesis that heavily outsourcing industries experience greater increases in their elasticities.

4.3. Nationality of Ownership and Labor Demand

In the literature on the relationship between globalization and labor markets, the impact of multinational enterprises (MNEs) has been much less researched than has the role of trade and other factors mentioned above. However, many researchers have pointed the multinationalization of production as the distinguishing feature of the current phase of globalization compared to previous periods (Bordo et al., 1999). Foreign direct investments (FDI) play a key role in this type of international economic integration. With inward FDIs, this also brings the employment of an increasing number of workers in affiliates of foreign-owned multinational enterprises (MNEs) worldwide

(Jungnickel, 2002). While some policy makers and economists perceive inward FDIs as a benefit to domestic employment by increasing productivity in the owned plants and generating positive spillovers to local firms, for others these increases in inward FDIs raise some concerns about labor market consequences in many countries. Fundamental fear is that multinational firms are inclined to shift jobs abroad and increase job volatility in local labor markets (Hakkala et al., 2010).

Rodrik (1997) explains the background of this fear with the "footloose" nature of multinationals in response to changes in production costs and argues that this characteristic of multinationals reduces job security for workers as firms can shift production across locations that experience different productivity shocks.[84] Hence, this helps to reduce costs related to firing and hiring labor. Alternatively, multinationals may, rather than totally shutting down production, simply diminish their operations and shed labor in the light of the availability of cheaper labor elsewhere. That means a given establishment which is owned by an MNE may have implications not only for the pace of labor demand adjustment but also for the magnitude of the adjustment in response to exogenous shocks. On the one hand, the overall labor demand in MNEs subsidiaries may be more rigid, because it may be characterized by a higher intensity of skilled labor, estimated to be less elastic to labor costs (Hamermesh, 1993). On the other hand, keeping equal the skill composition of labor demand, the labor cost elasticity in MNEs' subsidiaries is expected to be higher than that in national firms since MNEs have the privilege of relocating activities or shifting employment across countries in response to changes in labor costs (Barba Navaretti et al, 2003). Thus, if one desire to comprehensively analyze lower job stability in multinationals, then one also needs to investigate differences in the labor cost elasticity of multinationals relative to the indigenous industry (Görg et al., 2009). However, despite economic theory suggests different mechanisms, the issue of how multinational activity, foreign ownership and cross-border acquisitions affect labor demand elasticities is less explored (Hakkala et al., 2010).

[84] Also see OECD (1997) and Scheve and Slaughter (2004).

So, one of the main questions remained to the empirical literature is whether multinational enterprises (MNEs) exhibit different patterns of labor demand from purely domestic firms. And the plausible answers based on the standard models of trade and multinational companies point to the differences in terms of labor demand elasticities on the intensive margin.[85] Accordingly, they argue that, for several reasons, multinationals may have more-elastic labor demands than do domestic firms.[86] In this short literature survey, we review some studies which explore these differentials for labor demand elasticities between multinational and domestic firms.

Indeed, these discussions about MNEs are simply the expansion of the debate between globalization and wages.[87] Here the idea is actually simple. On this globalization era, with the spread of multinationals and increased international trade in goods, firms may face more competitive goods markets. With the global production networks mediated largely by multinationals, firms can more easily transfer production abroad in response to changes in wage costs either within firms (Helpman, 1984) or to external suppliers (Feenstra and Hanson, 1997). Fundamentally, the impact of foreign activities on the wage elasticity of labor demand in the home country depends on the degree of substitutability of employees in different countries (Brainard and Riker, 1997, 2001; Braconier and Ekholm, 2000; Konings and Murphy, 2001). If foreign operations substitute rather than complement for the home country activities, then we expect that the labor demand elasticities may get higher in the home country operations.

As it is above mentioned and widely explained by Rodrik (1997) why higher elasticities of labor demand matter. Because, higher elasticity of labor demand reduces the ability of workers to bargain effectively with multinational employers, which can lead to lower wages and a reduction in non-pecuniary benefits attached to jobs. In addition, increases in elasticities would mean important changes in the incidence of taxes. The incidence of labor taxes will fall much more on labor than on capital.

[85] On the extensive margin, this may be in terms of plant shutdowns.
[86] See Hakkala et al. (2010, p.264), for some of these reasons.
[87] See Haskel (2000) and Slaughter (2001) for the surveys about the debate between globalization and wages.

Therefore, such a link between multinational firms and highly wage elastic labor demand is said to contribute to labor market instability (Görg et al., 2012).[88]

Since the increase in labor demand elasticities matter as abovementioned, the mechanisms explaining whether multinational firms increase the labor demand elasticities and why multinational firms may raise elasticities worth to consider while exploring possible determinants of labor demand elasticities. These mechanisms have been demonstrated empirically in some studies summarized below.[89] Although this issue has attracted a great deal of attention in the public debate, there is relatively little research on the effects of multinational and foreign ownership on the elasticity of labor demand. In other words, there is not so much study which compares the labor demand elasticities in multinational and domestic firms. Studies exploring these comparisons are summarized below. They provide mixed evidences on the subject.

Fabbri et al. (2003) discuss this issue within the framework of standard neoclassical labor demand theory for the U.K. and U.S. manufacturing for about 30 years since the early 1960s. Their idea is quite simple. They argue that multinationals are part of global production networks, and so they can more easily transfer production in response to changes in production costs (in particular wages). According to their findings, wage elasticities of labor demand (conditional on output) increased for low skilled U.S. and U.K. manufacturing workers over time from about -0.5 to -1.0. They argue that increased activity of multinationals may be partially responsible for this. But they do not provide any analysis that can shed light on a possible causation.

However, by contrast, Barba-Navaretti et al. (2003), in a cross-country firm-level study of a group of 11 European countries between 1993 and 2000, estimate labor demand equations using dynamic panel data techniques (Arellano-Bond GMM estimators) on samples that permit to distinguish the ownership status of firms and find that, in most countries, multinationals adjust their labor demand more rapidly than domestic firms in response to shocks, but have a more inelastic demand curve with respect to wages. Their cross-correlations show that the relative value of wage

[88] See Markusen (2002) and Hanson et al. (2005), for the critics of this argument.
[89] Also see Slaughter (2001) and Hasan et al. (2003).

elasticities in MNEs on that in NEs is positively related to country-level indexes of labor market regulation (employment protection, union presence,…, etc.). They suggest that different skill compositions of the workforce in domestic- and foreign-owned firms, in combination with differences in wage elasticities for different skill groups, could explain these results. They argue that multinationals have a more rigid demand for total labor due to differences in skill structure. However, they note that, being MNEs relatively "footloose", this difference tends to dissolve as the rigidity of employment regulations rises.

Konings and Murphy (2001) are also partially related to the issue. They explore the extent to which multinationals substitute employment towards parent plants in response to wage changes. They find evidence of substitution between EU parent firms and their subsidiaries rather than towards low wage subsidiaries outside the EU.

Görg et al. (2009) investigates the link between nationality of ownership and wage elasticities of labor demand at the level of the plant for Ireland over the period 1983-1998. In particular, they examine whether labor demand in multinationals becomes less elastic with respect to the wage if the plant has backward linkages with the local economy. They report somewhat higher wage elasticities in foreign-owned firms than in domestic firms. The point estimates suggest the wage elasticity to be about -0.44 in domestic firms and about -0.5 in foreign-owned firms. Their empirical findings also show that the extent of local linkages indeed generally reduces the wage elasticity of labor demand.

Buch and Lipponer (2010) analyze whether increased activities of multinational firms are related with increased firm-level employment volatility. They use a firm-level dataset for Germany which allows identifying purely domestic firms, domestic multinationals, their foreign affiliates, and foreign firms that are active in Germany. They decompose the volatility of firms into their reaction and their exposure to aggregate developments. Broadly, they find no above-average wage and output elasticities and thus no differences in reactions for multinational firms.

Hakkala et al. (2007) use detailed firm level data to explore how increased internationalization and multinational activity impact the volatility of employment, or rather, the wage elasticity of labor demand. They analyze whether the wage elasticity of labor demand differs between multinational and non-multinational firms as well as between foreign-owned and domestic firms. They also analyze the wage elasticity of labor demand for different skill groups of employees. Moreover, they separate between an acquisition effect and a general ownership effect. Their findings do not show any general divergence in wage elasticities between different types of firms.

Hakkala et al. (2010) use firm-level data for Sweden, spanning the period 1990-2002, to examine if multinationality and foreign ownership affect the wage elasticity of labor demand. Different than previous studies, they distinguish the effect on different skill groups of employees. According to their findings, there is no general difference in wage elasticity between foreign and domestic firms, but the wage elasticity is higher in multinational firms than in national firms, in particular for medium-skilled workers. However, Görg et al. (2012) criticize this study, as they do not distinguish foreign and domestic multinationals but only estimate average wage elasticity for all multinationals, they may overestimate the wage elasticity for domestic multinationals and underestimate that for foreign firms.

Görg et al. (2012) find that labor demand in domestic multinationals is less sensitive to labor cost changes than in foreign multinational for the U.K. They state that this difference in the wage elasticity of labor demand persists even when they control for the skill intensity of firms or their level of intangible assets. They comment that this is parallel with the interpretation that the provision of headquarter services in domestic multinational firms protects against strong fluctuations in labor demand. Overall, their findings show that the wage elasticity of labor demand is about 40 percent lower in domestic than in foreign multinationals.

Overall, labor demand elasticities are important indicators in empirical research and policy analysis. They able to understand the effectiveness of reforms in the labor market and help to determine whether the outcomes of models are economically significant or not. As we summarized during the chapter, a large number of empirical

studies estimates the labor demand elasticities in order to assess labor demand responses of firms. This is one of the most clear signal about the importance of obtaining reliable estimates of labor demand elasticities. Nonetheless, there is no consensus on the correct value of labor demand elasticities and estimates of labor demand elasticities show a great heterogeneity in the literature. As we discussed earlier, several dimensions of research designs are responsible for these variations. The empirical work in this dissertation also is an outcome of a selected research design. This design is constructed following the empirical literature and as a result of many factors widening or limiting the context of study.

The next two chapters aim to present the empirical work of this dissertation study. First, the datasets used and the econometric methodologies are presented in Chapter 5. Then, in Chapter 6, the empirical specifications are derived, then all variables are introduced and the findings of empirical estimations are commented thoroughly.

5. DATA AND METHODOLOGY

This chapter aims to present the characteristics of the datasets used during the empirical work in the remainder of this dissertation study and summarizes the econometric methodologies utilized to infer the statistically and economically significant knowledge from this dataset.

5.1. Data

The issue of data is so critical to estimate the labor demand elasticities in the empirical literature.[90] A lot of studies have tried to estimate the labor demand elasticities using various sources of data. Cross-sectional datasets which are just including employee data (reflecting supply side of the labor market) provide to observe individual qualifications and wages. However, these datasets do not give information about firms at the micro level and so data for firms must be imputed using aggregate data. On the other hand, micro-level data for firms include variables like investments, total output or the number of employees, but the individual wages of workers or their skill levels are missing in these datasets. It is just possible to calculate the average wages using the sum of wages and the total number of workers. Since the wage is the most important explanatory variable for the estimations of labor demand functions theoretically, this calculation (deriving the wages from an aggregate) cast doubts on the accuracy and reliability of the estimation results. Nevertheless, due to data limitations for the demand side of the labor market in many countries, this kind of firm level micro data is better than nothing. The third and best option for labor demand analyses is for sure to use a linked employer-employee dataset which link administrative data of workers with the micro-level data of firms. However, due to lack of this type of detailed data, particularly for developing countries, the usage of this last kind of linked datasets is not widespread in the empirical literature, particularly among developing countries.

[90] One of the major reasons behind the negligence of labor demand studies in empirical labor economics is lack of micro data describing firms (Hamermesh, 1993).

The datasets used in the empirical parts of this dissertation depend on the micro data sources of Turkish Statistical Institute (TurkStat). National accounts, foreign trade statistics, labor force statistics (employment, unemployment and wages), prices (producer price indices), and the statistics for industry are also recompiled from the TurkStat for our descriptive analyses presented in Chapter 2.[91]

The focus of the empirical study in this dissertation is to explore the effects of internationalization on the demand side of the labor market for the Turkish manufacturing sector in 2000s.[92] To that end, we pay more attention to two major micro datasets of TurkStat, namely the Annual Industry and Service Statistics and Foreign Trade Statistics.[93] The micro dataset of Annual Industry and Services Statistics provide us the unique formal source of information to estimate the labor demand elasticities at the establishment level for the Turkish manufacturing sector. Similarly, the micro dataset of Foreign Trade Statistics provide us the sole information about international trade activities again at the establishment level. In sum, the combination of these two datasets enables us to estimate the labor demand elasticities and to detect whether these elasticities alter with globalization at the establishment level.

The micro data of Annual Industry and Service Statistics are the outcomes of establishment based field surveys in which the data have been collected via face to face methods by TurkStat. The statistical classification of economic activities in this dataset is based on the nomenclature of economic activities in the European Union (NACE) Rev. 1.1 classification for the years between 2003 and 2008. Since 2009, the classification of establishments by type of economic activity has been determined in accordance with the Statistical Classification of Economic Activities in the European Community (NACE Rev. 2). However, TurkStat recently transformed NACE Rev 1.1 classification of 2003-2008 data to NACE Rev. 2, so as of now it is possible to study with a continuous data series from 2003 to 2011 with NACE Rev. 2 classification. In the empirical parts of this dissertation, we also employ this dataset.

[91] For the details of these datasets, see the website of the TurkStat, www.turkstat.gov.tr.
[92] Different aspects of this internationalization process are mentioned during the relevant chapters (see Chapter 1 and 4).
[93] Following metadata about these two datasets is compiled from the website of TurkStat.

Agriculture, forestry and fishing; financial and insurance activities; public administration and defense; compulsory social security; activities of households as employers; undifferentiated goods-and services-producing activities of households for own use, and activities of extraterritorial organizations and bodies are not covered within the scope of this dataset. Moreover some divisions and classes of covered sectors are not included. Namely, programming and broadcasting activities in information and communication activities; buying and selling of own real estate and renting and operating of own or leased real estate in the real estate activities; and the activities of membership organizations in other service activities are not covered (TurkStat, 2014c).

TurkStat uses two methods while compiling the data for Annual Industry and Service Statistics. First method is the full enumeration. For the establishments having more than 20 employees and for the establishments which are active in some special classes, the full enumeration method is used. Besides, if the numbers of establishments are less than 100 according to the classification of NACE Rev. 2 (4-digit), they are also covered by full enumeration method. For the establishments having less than 20 employees, sampling method is used by TurkStat.

Although the sampling unit is establishment, TurkStat considers the fact that an establishment can be constituted by either more than one local unit or only one local unit. If the establishment is constituted by only one local unit, TurkStat accepts this local unit is establishment itself. So, the aim of Annual Industry and Service Statistics is to produce information based on both establishments and local units. To that end, TurkStat plans to reach NACE Rev. 2 (4-digit) class-level estimations for Turkey in terms of establishments and NACE Rev. 2 (2-digit) division-level regional estimations in terms of local units for all sectors.

On the website of TurkStat (www.turkstat.gov.tr), some statistical tables of Annual Industry and Service Statistics are publicly available.[94] They are divided by NACE Rev. 1.1 and NACE Rev. 2 headlines for the years 2003-2008 and 2009-2011, respectively. Each headline includes 10 tables. The titles of these tables are:

[94] However, the opportunity to infer meaningful figures from these tables is so limited, see Figure A.6 and Figure A.7 for instance.

- *Employment and basic indicators by sections in industry and service sectors*
- *Number of employees and personnel cost by economic activity*
- *Some basic indicators by size classes and sections (divisions for NACE Rev. 2)*
- *Fixed capital investment and sales by economic activity*
- *Employment and some basic indicators by economic activity*
- *Employment by size classes and sections (divisions for NACE Rev. 2)*
- *Change in stocks (just for NACE Rev.2)*
- *Some basic indicators by economic activity*
- *Number of employees in full-time equivalent units and hours worked by employees by economic activity*
- *Some basic indicators by local units*
- *Number of enterprises and characteristics of employees by economic activity*

The variables covered in these tables are:

- *Number of establishments*
- *Number of local units*
- *Number of persons employed*
- *Number of female employed*
- *Number of male employed*
- *Number of employees*
- *Number of female employees*
- *Number of male employees*
- *Number of apprentices*
- *Number of employees in full-time equivalent units*
- *Number of part-time employees*
- *Number of hours worked by employees*
- *Personnel cost*
- *Wages and salaries*
- *Contributions to social security*
- *Total purchases of goods and services*
- *Turnover*
- *Production value*
- *Value-added at factor cost*
- *Gross investment in tangible goods*
- *Gross investment in land*
- *Gross investment in existing buildings and structures*
- *Gross investment in construction and alteration of buildings*
- *Gross investment in machinery and equipment*
- *Gross investment in other tangible goods*
- *Fixed capital sales*
- *Change in stocks of goods and services*
- *Value of raw materials, auxiliary materials and fuel stocks*
- *Change in stocks of finished products and work in progress manufactured by the unit*
- *Change in stocks of goods and services purchased for resale in the same conditions as received*
- *Other stocks (scrap, waste product and other materials stock)*

Lastly, additional tables are included into the website for the period between 2003 and 2009, in NACE Rev.2 classification. These tables also include information about employment and about some basic indicators by economic activity in 2-digit level.

Our empirical analyses aim to cover the manufacturing sector as a whole. Our observational level is establishments. So we study at 4-digit level with NACE Rev.2 classification. Since the micro datasets in our hand covers the years 2003-2008 and 2009-2011, the period in our analyses needs to be limited at most with 2003-2011, but there are irrecoverable missing data problems in the datasets of 2003 and 2004, so we limit our operational sample with the period between 2005 and 2011.

Therefore, for the empirical analyses, first we use the micro datasets which are compiled to form the Annual Industry and Service Statistics. These statistics are the outcomes of establishment-based field surveys, namely Business Statistics which have been collected by face to face methods by TurkStat as it is mentioned.

At this point, some remarks are necessary about the coverage of that firm data. First, we just focus on the manufacturing sector, since our theoretical background assumes labor input as homogeneous. Second, our analyses only cover the private manufacturing sector, since the dataset of TurkStat is limited only with private sector. Third, again due to limitations of data, our analyses are limited to the formal sector. Fourth, our dataset is starting with 2003, since the previous data set of TurkStat at firm-level covers the years between 1980 and 2001, but the survey methodology is totally different than the recent dataset of 2003-2011.

Second micro dataset which we use in our empirical analyses is from the Foreign Trade Statistics. For the analytical framework of this dataset, TurkStat (2014b) states that "*Turkey applies the Special Trade System rules for foreign trade statistics and these statistics include goods which enter or leave the statistical territory of Turkey from or to other countries*." Additionally, these goods "*are placed under the customs normal export and import procedures and under customs inward and outward processing procedures*" (TurkStat, 2014b).

The classification used by TurkStat for compiling Turkey's Foreign Trade Statistics is the Harmonized System (HS) 12-digit. The first 8-digit (CN) is international and the last 4-digit is national. Besides, the data for foreign trade are available in SITC Rev.4, SITC Rev.3, SITC Rev.2, ISIC Rev.4, ISIC Rev.3, ISIC Rev.2, BEC, CPA, CPC and NST2007 classifications. In classifications of countries, the country classification Geonomenclature of European Union is used. Furthermore, TurkStat (2014b) classifies country groups considering their economic and geographic conditions. Another classification adopted by TurkStat (2014b) is the classification of product groups by technology intensity which is prepared by OECD based ISIC Rev.3 classification.

For the scope of this data, TurkStat (2014b) states that the geographical coverage of this data set is constrained with the customs boundaries. So customs warehouses, free zones and duty-free shops in Turkey are accepted as beyond the customs frontier of Turkey and the trade activities occur in these areas are not covered within the foreign trade statistics. Therefore the statistical territory is the custom territories except free zones and warehouses. Moreover, some items are not covered within the foreign trade statistics, such as transit trade, temporary trade and monetary gold and transactions under 100 dollars. Besides, the data for shuttle trade are not included into the Foreign Trade Statistics.[95]

As the accounting conventions within the Foreign Trade Statistics, while converting the unit of account, the Central Bank of the Republic of Turkey's (CBRT) daily exchange rates are used. Additionally, exports are valued by free on board (FOB) and imports are valued on cost, insurance and freight (CIF).

The main data source of TurkStat (2014b) to compile data for Foreign Trade Statistics is the declarations of customs. However, data for electricity, natural gas and crude petrol are taken from firms by TurkStat. The main statistical items collected by TurkStat (2014b) within the context of Foreign Trade Statistics are goods flow, the reference period, customs, commodity code, partner country, the nationality of the means of transport at the frontier, mode of transport, customs procedure, statistical value

[95] TurkStat and Central Bank of the Republic of Turkey (CBRT) estimates the value of shuttle trade for balance of payments calculations. However, these calculations are not included in the foreign trade statistics of TurkStat (TurkStat, 2014b).

(export FOB/import CIF), net mass (kg), supplementary unit, delivery terms, nature of transaction and the type of payment. While collecting these items, the basis of country data is the country of origin for imports and the country of last known destination for exports. Moreover, TurkStat (2014b) is able to present the data by province, country of origin (for imports) and country of final destination (for exports). Furthermore, disaggregation by country groups is also available in the TurkStat.

5.1.1. About Micro Data

TurkStat (2014) states that it "*provides access and usage facility for the micro data of survey and researches in accordance with the legal legislation based on the demands of national and international researchers."* These micro data files provided by TurkStat (2014) include individual data for each statistics given they have been filtered appropriately to achieve anonymous information so as to ensure confidentiality.

According to the regulations of TurkStat (2014) about procedures and principles of data privacy and confidential data security of official statistics, these data sets brought into use upon approval of the TurkStat Presidency are classified into Group A and B depending on access procedures.

The A Group Data comprises of data that are permitted to be accessed only in Data Research Centers (DRCs) settled at the Headquarter of TurkStat in Ankara and Regional Offices of Istanbul, Izmir, Adana, Antalya and Gaziantep and not allowed to be taken out of the Institute.

The micro datasets of Annual Industry and Service Statistics and Foreign Trade Statistics are assessed under the A Group Micro Data by TurkStat. Therefore, all the empirical analyses within this dissertation study are conducted in the Data Research Center (DRC) of Istanbul Regional Office of the TurkStat with a signed formal protocol between the author of this dissertation and the TurkStat. According to the relevant articles of this protocol I clearly state that the primary sources of data in this dissertation study is TurkStat. Although the results of this study are permitted to be taken outside the TurkStat after controls of related experts of institute, the level of accuracy or reliability of the estimates is under my responsibility.

As it is abovementioned at length, in our empirical analyses, first we use the micro datasets of Annual Industry and Service Statistics which are compiled via face-to-face surveys using Structural Business Statistics Establishment Questionnaire Forms at the establishment level by TurkStat.

Our focus questions in these surveys are about employment, value-added at factor cost and payments to the workers in a given establishment. Employment data are collected four times in a year (February, May, August, and November) for employees and owners, shareholders and unpaid family workers. Arithmetic average of them gives annual average employment number. These employment levels are calculated separately for both males and females. Besides average number of employees in manufacturing if manufacturing activity is conducted within the establishment and annual average number of employees of the subcontractor if the establishment employs other establishments' personnel as subcontractors are asked to the establishments in the questionnaire forms.

Moreover, which kind of personnel employed is asked in that survey according to their qualifications. For instance, number of R&D personnel, number of paid apprentices and trainees, number of part-time employees and number of paid home workers listed in the payroll are given in the dataset.

If total paid hours worked can be calculated for the establishment, then data about total paid hours worked in the year is also given. If total paid hours worked cannot be calculated, just working hours of one paid employee per week is asked to the establishments.

Payments to employees part of the survey is divided by gross payments to personnel (employers contributions to social security and compensations excluded), social security contributions of employer (only employers share), denunciation compensation and seniority compensation. Sum of these payments and compensations gives the total personnel costs. In this study, we call them labor costs.

Value-added at factor cost is the gross income from operating activities after adjusting for operating subsidies and indirect taxes. This variable is used as a proxy of output in the empirical part.

Foreign Trade Statistics are also assessed under the A Group Data by TurkStat and again empirical studies with this dataset are conducted in the DRC in TurkStat's Istanbul Office. All the statements of me for Annual Industry and Service Statistics are also valid for this dataset.

Our focus of interest in this dataset is the values of exports and imports. Besides, as we can observe the products individually with 12-digit, we have the option to convert them into BEC categories. Thus, we are able to classify the products in terms of capital, intermediate or consumption goods according to the Broad Economic Categories (BEC). Therefore, we may calculate the share of imported intermediate inputs in imports. This share as a proxy has an importance to grasp the role of international outsourcing on the labor demand elasticities. Besides, we get exports, imports and total trade volumes for each firm in our dataset. The explanations of this procedure for data preparation are given in the next section.

5.1.2. Construction of the Panel Data

We append annual cross-sectional micro data of Structural Business Surveys to construct a panel data for our empirical analyses.[96] To that end, we make use of *id* variable as a panel variable given in the datasets which identifies each individual establishment. Also, we create *year* variables as a time variable within each cross-section to attribute the each year to the annual characteristics (rows) of establishments in that year.

Our panel data includes the year-groups between 2003-2008 and 2009-2011. And we focus on the establishments in which their dominant economic activities are in the manufacturing sector. The classification of economic activity for each establishment is defined at 4-digit level in the micro data. While NACE Rev 1.1 classification is valid

[96] Structural Business Surveys are the sources for the Annual Industry and Service Statistics.

for the years between 2003 and 2008, NACE Rev 2 classification is valid for the years 2009, 2010, and 2011. Moreover, as it is before mentioned, we have a continuous series for the NACE Rev.2 classification during the period between 2003 and 2011. We use this last data series including NACE Rev. 2 classification for each establishment.

Each year some establishments enter into the panel and some establishments exit from the panel. To form a balanced panel data, we follow the establishments which continue their economic activities permanently during our analysis period (2005-2011). Otherwise, we get an unbalanced panel if we do not consider continuity of firms.[97]

The number of rows and variables in the micro data sets of Annual Industry and Service Statistics varies for each year. Table 5.1 presents this information.

Table 5.1 Micro Data of Annual Industry and Service Statistics (Establishments)

Year	Number of Rows (Total)	Number of Rows (Manufacturing)	Number of Variables
2005	63304	25491	175
2006	85016	34137	183
2007	83963	33353	184
2008	82662	30115	184
2009	99921	35059	190
2010	106715	33890	189
2011	138013	41194	189

After weighting the establishments, we get the total number of establishments in Table 5.2.

Table 5.2 Number of Establishments (Total and Manufacturing)

Year	Number of Establishments (Total)	Number of Establishments (Manufacturing)
2005	2393578	300083
2006	2473841	307033
2007	2567704	313467
2008	2583099	318176
2009	2483300	320815
2010	2321979	299928
2011	2591082	333288

[97] The entries and exits of firms are also very crucial within the literature of labor demand. However, they are the subjects of a further study and so they are not covered within the scope of this dissertation study.

After appending the annual cross-sections, we get a balanced panel dataset which constitutes the basis of our empirical analyses. At the second step we merge the micro data of Annual Industry and Service Statistics with the micro data of Foreign Trade Statistics micro data and we deflate all nominal variables with sectoral producer price index (PPI) at NACE Rev.2 level. Therefore all nominal variables (such as labor costs, value-added, export, import, total trade volume, imported intermediate input) are converted into real terms and calculated at the establishment level.

5.1.3. Operational Sample

Following the explanations above with the datasets, our operational sample covers the private manufacturing establishments at 4-digit level (NACE Rev.2) between the years 2005 and 2011. In our balanced panel dataset, we have 9,342 establishments for each year and so, in total for 7 years (2005-2011) we have 65,394 observations. The descriptive statistics of some selected variables for this operational sample and for other alternative samples are presented in Table 5.3.[98] In Table 5.4, we dig deeper in our operational sample and present some descriptive statistics of main variables in our analyses for different subsamples of our operational sample. In Table 5.5, the summary statistics of the variables in our operational dataset are presented.

[98] Alternative samples are prepared for further studies.

Table 5.3 Descriptive Statistics of Selected Variables for Different Panels

Main Variables/Panels	**20+ Manufacturing Sector (Balanced Panel) (2005-2011) T=7; n=9342; N=65,394** ***(Operational Sample)***	**20+ Manufacturing Sector (Unbalanced Panel) (2005-2011) T=7; N=139,027**	**All Sectors (Balanced Panel) (2005-2011) T=7; n=23003 N=161,021**	**All Sectors (Unbalanced Panel) (2005-2011) T=7; N=659,515**
Production Value (Mean) (TL)	34,038,965	20,447,420	24,870,946	8,274,762
Value Added (Mean) (TL)	6,757,137	4,004,747	6,502,572	2,106,217
Personnel Costs (Mean) (TL)	2,997,083	1,879,744	2,960,109	1,000,612
Wages (Mean) (TL)	2,569,237	1,608,924	2,544,517	857,145
Social Security Costs (Mean) (TL)	427,846.3	270,819.2	415,592.4	143,466.9
Total Employees (Mean)	137.3466	96.58788	132.1221	51.64293
Paid Employees (Mean)	136.4003	95.6843	131.2303	50.69039
Foreign Capital Share (Mean) (%)	3.581639	3.632309	4.90157	1.99356
Trade Volume (Mean) (TL)	19,111,933	10,424,338	11,820,962	3,422,509
Export Volume (Mean) (TL)	7,382,244	4,075,354	3,984,512	1,217,666
Import Volume (Mean) (TL)	11,729,689	6,348,985	7,836,450	2,204,843
Intermediate Input Import Volume (Mean) (TL)	9,550,756	5,098,804	5,466,771	1,507,408

Source: Author's calculations.

Table 5.4 Descriptive Statistics of Selected Variables in Operational Sample

20+ Manufacturing (Balanced Panel) (2005-2011) T=7 n=9342 N=65,394	**(Only) Exporting Establishments**	**(Only) Importing Establishments**	**(Both) Exporting and Importing Establishments**	**Non-Trading Establishments**	**Foreign Capital Share=0%**	**Foreign Capital Share>50%**	**Foreign Capital Share=100%**
# of Observations	6,890	9,540	33,545	15,419	61,972	2,078	1,110
Value Added (Mean) (TL)	986,742.2	3,331,425	1.15e+07	1,069,256	5,073,679	3.68e+07	2.98e+07
Production Value (Mean) (TL)	5,734,734	17,472,628	57,583,105	5,714,874	26,139,019	167,574,932	131,730,174
Total Employment (Mean)	52.8	101.1	201.1	58.8	121.7	418.9	395.0
Value Added per Employee (Mean) (TL)	18,916.23	28,620.15	40,413.99	17,242.85	28,574.22	80,158.38	76,976.32
Wage per Paid Employee (Mean) (TL)	9,008.888	11,288.5	14,825.25	9,172.351	11,458.82	31,505.22	32,857.68

Source: Author's calculations.

Table 5.5 Summary Statistics of the Variables in Operational Sample

Variable	Obs	Mean	Std. Dev.	Min	Max
exp_total	65394	3.25e+07	2.87e+08	1466	3.65e+10
exp_agency	65394	19510.91	384568.3	0	4.49e+07
exp_subcont	65394	218929.1	2267977	0	1.90e+08
exp_contract	65394	505607.6	2794394	0	1.58e+08
inc_total	65394	2.37e+07	2.29e+08	0	2.85e+10
inc_subcont	65394	26382.73	1370287	0	3.22e+08
inc_contract	65394	282926.7	2159213	0	1.43e+08
prod_value	65394	3.40e+07	2.84e+08	-2053866	3.51e+10
value_added	65394	6757137	3.94e+07	-5.90e+07	2.49e+09
labor_costs	65394	2997083	1.48e+07	18849.66	7.36e+08
wages	65394	2569237	1.29e+07	15601.25	6.35e+08
labor_taxes	65394	427846.3	1975116	0	1.01e+08
emp_total	65394	137.3466	364.2615	20	16445
emp_male	65394	107.0352	317.5084	0	15737
emp_female	65394	30.31144	90.51639	0	4149
paid_emp	65394	136.4003	364.3546	15	16445
paid_emp_m	65394	106.1988	317.5871	0	15737
paid_emp_f	65394	30.20156	90.51575	0	4149
weight	65394	1	0	1	1
foreign_cap	47629	4.917544	19.82948	0	100
trade_total	65394	1.91e+07	3.03e+08	0	3.81e+10
export_total	65394	7382244	9.60e+07	0	7.17e+09
import_total	65394	1.17e+07	2.26e+08	0	3.09e+10
imp_int	65394	9550756	1.88e+08	0	2.47e+10
ppi	65394	1.42518	.2894719	.7557	3.9419

Source: Author's calculations.

5.2. Methodology

In this second subchapter, the econometric methodologies employed are shortly explained to provide a background for the empirical analyses conducted in the next chapter. Since the data set (described in the previous subchapter) used in the analyses are in a form of panel data (also called as longitudinal data or cross-sectional time series data), estimation techniques of the panel data models are summarized in that subchapter. These models are appropriate ones since the data consists of the pooling of observations on a cross-section of establishments within the manufacturing sector of Turkey over the period of 2005-2011. Additionally, the dataset used in our analyses is balanced because we exclude the observations which are not available for the same time periods (in our case, years) and for all cross sections units. Before presenting the model, it is useful to list the benefits and limitations of using panel data. Following Hsiao (2003) and Klevmarken (1989), Baltagi (2005) lists the benefits from using panel data as follows:

i) *Panel data helps to control for individual heterogeneity.*

ii) *Panel data gives more informative data, able to handle with more variability, embodies less collinearity among the variables, but provides more degrees of freedom and more efficiency.*

iii) *Panel data are better able to study the dynamics of adjustment.*

iv) *Panel data are better able to identify and measure effects that are simply not detectable in pure cross-section or pure time-series data.*

v) *Panel data models allow us to construct and test more complicated behavioral models than purely cross-section or time-series data.*

vi) *Micro panel data gathered on individuals, firms and households may be more accurately measured than similar variables measured at the macro level.*

Limitations of panel data are also described by Baltagi (2005):

i) *Design and data collection problems.*

ii) *Distortions of measurement errors.*

iii) *Selectivity problems due to non-random sampling.*

iv) *Short time-series dimensions.*

v) *Cross-section dependence.*

5.2.1. The Static Linear Panel Data Estimation

The typical panel data model can be formulated as follows:[99]

[5.1]

$$y_{it} = \alpha + \beta X_{it} + u_{it}$$

where i denotes the cross-section dimension such as households, individuals, firms, countries, etc. and t denotes the time series dimension such as years, months, days, hours etc. α is a scalar, β is the coefficient of the explanatory variable and u_{it} is the disturbance term. As stated by Baltagi (2005), most of the panel data applications utilize a one-way error component model for the disturbances:

[5.2]

$$u_{it} = \mu_i + v_{it}$$

where μ_i denotes the unobservable individual-specific effect (time-invariant) and v_{it} denotes the remainder (usual) disturbance.

The assumptions on μ_i are critical to determine which model will be chosen among fixed effects and random effects models. In the case of fixed effects model, the μ_i are assumed to be fixed parameters to be estimated and the remainder disturbances stochastic with v_{it} independent and identically distributed $IID(0, \sigma_v^2)$. Besides, the X_{it} are assumed independent of the v_{it} for all i and t. However, to avoid the loss of degrees of freedom, the μ_i can be assumed random as in the case of the random effects model.

[99] The notations in this section are adopted from Baltagi (2005).

Additionally, $\mu_i \sim IID(0, \sigma_\mu^2)$, $v_i \sim IID(0, \sigma_v^2)$ and the μ_i are independent of the v_{it}. Moreover, the X_{it} are independent of the μ_i and v_{it}, for all i and t.

Baltagi (2005) states that the fixed effects model is an appropriate specification if the focus is on a specific set of N establishments and inference is restricted to the behavior of these establishments. On the other hand, the random effects model is an appropriate specification if N individuals are being drawn randomly from a large population.

Fixed-effects model explores the relationship between dependent and independent variables within an entity (in our case the establishments in the Turkish manufacturing sector). Each establishment may have its own individual characteristics that may or may not influence the explanatory variables. By fixed effects model, we assume that time-invariant characteristics are unique to the individual establishments and should not be correlated with other individual characteristics. That means the error terms of each entity must not be correlated with the others. Therefore, the fixed effects model controls for time-invariant differences between the individuals which mean the estimated coefficients of the model cannot be biased due to omitted time-invariant characteristics. On the other hand, the random effects model implies the variation across establishments is assumed to be random and uncorrelated with the explanatory variables included in the model. That means the random effects model assumes that each establishment's error term is not correlated with the explanatory variables which allows for time-invariant variables to play a role as explanatory variables.

The next step is to decide on which model will be used to estimate the static models given in the next chapter.[100] To do this, the Hausman (1978) specification test is frequently employed to choose the appropriate model for estimations. In order to conduct the Hausman specification test, first, the fixed effects model is run and the results are saved, then secondly the random effects model is run and the results are saved. Finally, the Hausman specification test is carried out. The hypotheses of the Hausman specification test are as following:

[100] See Verbeek (2004) and Baltagi (2005) for an extensive discussion of these two models and conditions for the application of the respective one.

H_0: Error terms are not correlated with the regressors.

H_A: H_0 is not true.

or alternatively:

H_0: The random effects model is the appropriate.

H_A: The fixed effects model is the appropriate.

5.2.2. The Dynamic Linear Panel Data Estimation

The labor demand (or employment) issue dealt within this dissertation study is dynamic by nature. This dynamic relationship is characterized by the presence of a lagged dependent variable among the regressors. So, linear dynamic panel-data models include p lags of the dependent variable as covariates and contain unobserved panel-level effects, fixed or random. The basic dynamic linear model (one-way error component model) may be formulated as follows:

[5.3]

$$y_{it} = \delta y_{i,t-1} + \beta x_{it} + u_{it}$$

where $i = 1, \dots, N;\ t = 1, \dots, T$ and we assume $u_{it} = \mu_i + \upsilon_{it}$ with $\mu_i \sim IID(0, \sigma_\mu^2)$ and $\upsilon_{it} \sim IID(0, \sigma_\upsilon^2)$, supposing μ_i and υ_{it} are independent of each other and among themselves. μ_i denotes an individual effect peculiar to the establishment that does not vary over time and υ_{it} denotes the disturbance term.[101]

Inherently, the unobserved panel-level effects are correlated with the lagged dependent variables, leading standard estimators to be biased and inconsistent. Because of the lagged variable, OLS is biased and inconsistent, even if the υ_{it} are not serially corrected. That is why y_{it} is a function of μ_i, so is $y_{i,t-1}$.[102] This is the dynamic panel bias (Nickell, 1981). According to Bond (2002), the standard results of omitted variable bias show that the OLS estimator is likely to be biased upwardly in these situations. The

[101] We assume that the disturbance terms, υ_{it}, are serially uncorrelated.
[102] This means that the regressor $y_{i,t-1}$ is correlated with the error term $u_{it} = \mu_i + \upsilon_{it}$.

fixed effects estimator is biased but consistent for $T \to \infty$. Although the within transformation wipes out the μ_i, the problem continues because $y_{i,t-1}$ is still correlated with the $\overline{v_i}$ by construction. Here, Bond (2002) shows that standard results of omitted variables bias indicate that the fixed effects estimator is biased downwards.[103] The random effects estimator is also biased, because $\left(y_{i,t-1} - \theta\overline{y_{i.,-1}}\right)$ will be correlated with $(u_{it} - \theta\overline{u_{i.,-1}})$.

Anderson and Hsiao (1981) provide solution to the problem of inconsistent estimators of dynamic panel models. Anderson and Hsiao (1981, 1982) suggest using further lags of the level or the difference of the dependent variable to instrument the lagged dependent variables which are included in a dynamic panel-data model after the panel-level effects have been removed by first-differencing:

[5.4]

$$y_{it} - y_{i,t-1} = \delta\left(y_{i,t-1} - y_{i,t-2}\right) + (v_{it} - v_{i,t-1})$$

where $t = 2, 3, \ldots, T$.

But this proposed method leads to consistent but not necessarily efficient estimates, because it does not use of all available moment conditions and it does not consider the differenced structure on the residual disturbances Δv_{it}.

Arellano and Bond (1991) contribute this idea by noting that, in general, there are many more instruments available and then they proposed a more efficient estimation procedure. Arellano and Bond (1991) argue that the Anderson-Hsiao estimator fails to take all of the potential orthogonality conditions into account while it is consistent. In other words, they argue that additional instruments can be obtained if one utilizes the orthogonality conditions that exist between lagged values of y_{it} and v_{it}. Therefore, the crucial aspect of the Arellano and Bond (1991) strategy, echoing that of Anderson and Hsiao, is the assumption that the necessary instruments are internal. That means they are

[103] Therefore, since the OLS and the fixed effects estimators are likely to be biased in opposite directions, it may be useful to apply these two estimators (see Table 6.20). Because, potential consistent estimates of the lagged dependent variable may range between the OLS and the fixed effects estimates (Bond, 2002).

based on lagged values of the instrumented variable(s). Besides, the estimators allow the inclusion of external instruments.[104]

Building on Holtz-Eakin, Newey, and Rosen (1988) and adopting the GMM framework developed by Hansen (1982), Arellano and Bond (1991) determine how many lags of the dependent variable, the predetermined variables, and the endogenous variables are valid instruments and how to combine these lagged levels with first differences of the strictly exogenous variables into a potentially large instrument matrix. Arellano and Bond (1991) derive the one-step and two-step GMM estimators, as well as the robust VCE estimator for the one-step model, using this instrument matrix. Additionally, they found that the robust two-step VCE was seriously biased. However, Windmeijer (2005) developed a bias-corrected robust estimator for VCEs of two-step GMM estimators. The test for the autocorrelation of order m and the Sargan test of overidentifying restrictions are also derived by Arellano and Bond (1991).

The approach of Arellano and Bond (1991), and its extension to the System GMM context, is an estimator designed for situations with:

- *small T, large N panels: few time periods and many individual units.*
- *a linear functional relationship*
- *one left-hand variable that is dynamic, depending on its own past realizations*
- *right-hand variables that are not strictly exogenous: correlated with past and possibly current realizations of the error*
- *fixed individual effects, implying unobserved heterogeneity*
- *heteroskedasticity and autocorrelation within individual units' errors, but not across them* (Roodman, 2009, p.86)

To sum up, Arellano and Bond (1991) derived a consistent generalized method of moments (GMM) estimator. This estimator is developed for datasets with many panels and few periods, and it requires that there be no autocorrelation in the idiosyncratic errors. Therefore it is appropriate for our estimations in Chapter 6.

[104] In sum, the idea in GMM estimation is to use all available moment conditions and to minimize a weighted function of the corresponding sample moments, giving more weight to those moments more accurately estimated, to those characterized by a relatively low variance (Verbeek, 2004, p.157).

6. EMPIRICAL SPECIFICATIONS AND FINDINGS

In this chapter of the dissertation, after presenting the empirical models, we summarize the findings of our empirical works and try to determine basically whether globalization has significantly altered the labor demand and labor demand elasticities of establishments in the Turkish manufacturing sector for the period between 2005 and 2011. To that end, we estimate first static and then dynamic labor demand models to capture the effects of both long- and short-run labor demand adjustments on the labor demand elasticities using the balanced panel data scrutinized in the previous chapter.

This empirical investigation includes three subtopics inside to explore the impacts of globalization on labor demand and on labor demand elasticities with three different but interrelated perspectives. Accordingly, the effects of international trade, international outsourcing and the foreign ownership on the labor demand and labor demand elasticities are explored respectively.

To that end, in each subchapter, the static and dynamic empirical specifications of labor demand functions are presented first, and then the related estimation results are commented thoroughly. After the estimations of base specifications, our major analytical context is threefold. Following the empirical specifications, first, we estimate the baseline specifications both in the static and dynamic structures. Then, as our main focus of interest, we estimate similar form of equations following the related specifications explained in relevant sections. Lastly, we calculate the short- and long-run labor cost and output elasticities of labor demand and calculate the half-life of the adjustment of labor demand.

The econometric methodologies applied during the analyses are the two-way fixed effects estimations for static specifications and Arellano-Bond (1991) linear dynamic panel data estimations for dynamic specifications. The details of these methodologies are presented in the previous chapter. All the econometric works in this chapter are done with licensed software STATA 12 in the Istanbul Regional Office of the TurkStat.

6.1. Baseline Specifications

As it is broadly explained in the theoretical background chapter (see Chapter 3), according to the basic neoclassical model, labor demand is basically determined by labor costs and output level. Following the last functional form attained at the end of the first subchapter within the theoretical background chapter (see Equation 3.15), labor demand function can be simply formulated as follows:

[6.1]

$$L = f(w, Y)$$

where L stands for labor demand, w and Y represent the labor costs and output level, respectively. Accordingly, labor demand depends on the labor costs and economic growth. While an increase (decrease) in labor costs causes a decrease (increase) in labor demand, an increase (decrease) in output growth leads to an increase (decrease) in labor demand. In other words, labor demand has a negative relationship with labor costs, but a positive relationship with output growth. Our static (long-run) and dynamic (short-run) baseline empirical specifications below are based on this basic functional structure. Therefore, in line with the neoclassical theory, we expect to find significant estimates of negative labor cost elasticities and positive output elasticities.

Following the basic function of labor demand abovementioned, the baseline empirical specification in the static (long-run) structure is transformed into a reduced-form model:[105]

[6.2]

$$lnL_{i,t} = \alpha_{i,t} + \beta_1 lnw_{i,t} + \beta_2 lnY_{i,t} + \varepsilon_{i,t}$$

where lnL is the employment (in logarithm), lnw is the real total labor cost including gross wages and non-wage costs paid by employers (in logarithm), lnY is the real output (in logarithm), and the error term, ε, consists year-specific effects, establishment fixed

[105] Reduced-form models are based on log-linear specifications of unconditional and conditional labor demand models and these models are more flexible regarding explanatory variables included. Their estimated coefficients are directly interpretable as elasticities (Lichter et al., 2014, p.6).

effects and independent and identically distributed (i.i.d.) random error term. The subscripts i and t represent the cross section and time, respectively. Sectoral producer price index (PPI) is used to deflate the nominal variables while transforming these variables into real variables. In order to avoid from a bias and identification problem, we need to add relevant exogenous variables (Z) into this baseline specification:

[6.3]

$$lnL_{i,t} = \alpha_{i,t} + \beta_1 lnw_{i,t} + \beta_2 lnY_{i,t} + \gamma Z_{i,t} + \varepsilon_{i,t}$$

where Z consists of international trade related explanatory variables and other expenditure related explanatory variables parallel with our motivations, aims and research questions emphasized at length in the introduction chapter. The formulations of these variables are explained in the next parts.

If we write down the same basic empirical specification in a dynamic (short-run) structure following the partial adjustment model mentioned at the end of the second subchapter of the theoretical background part (see Equation 3.23):

[6.4]

$$lnL_{i,t} = \alpha_{i,t} + \delta lnL_{i,t}(-1) + \beta_1 lnw_{i,t} + \beta_1^{`} lnw_{i,t}(-1) + \beta_2 lnY_{i,t} + \beta_2^{`} lnY_{i,t}(-1) + \gamma_k Z_{i,t} + \varepsilon_{i,t}$$

where the first lags of employment, labor costs and output are added into the specification.

So far, we directly add exogenous variables into the specifications in an additively manner. These specifications basically provide us to understand the effects of these exogenous variables on the labor demand as labor demand shifters. However, in order to understand the effects of these variables on the labor demand elasticities (on labor cost elasticity and output elasticity), we also need to add these variables into the specifications interactively. By doing that, we may determine whether or not exogenous variables significantly alter the labor demand elasticities. The static and dynamic specifications with interactively added exogenous variables may be formulated as:

[6.5]

$$lnL_{i,t} = \alpha_{i,t} + \beta_1 lnw_{i,t} + \beta_2 lnY_{i,t} + \gamma Z_{i,t} + \beta_3 Z_{i,t} lnw_{i,t} + \beta_4 Z_{i,t} lnY_{i,t} + \varepsilon_{i,t}$$

[6.6]

$$\begin{aligned} lnL_{i,t} = \alpha_{i,t} &+ \delta lnL_{i,t}(-1) + \beta_1 lnw_{i,t} + \beta_1^{`} lnw_{i,t}(-1) + \beta_2 lnY_{i,t} + \beta_2^{`} lnY_{i,t}(-1) \\ &+ \gamma_k Z_{i,t} + \beta_3 Z_{i,t} lnw_{i,t} + \beta_3^{`} Z_{i,t} lnw_{i,t}(-1) + \beta_4 Z_{i,t} lnY_{i,t} \\ &+ \beta_4^{`} Z_{i,t} lnY_{i,t}(-1) + \varepsilon_{i,t} \end{aligned}$$

where exogenous variables (Z) are both additively and interactively (with labor cost and output variables) specified for long- and short-run estimations, respectively.

6.1.1. Findings for Base Specifications

The first column of Table 6.1 summarizes the findings of base estimations which are specified as in Equation [6.2]. The dependent variable in the baseline estimation is the log of paid employees (lnPaidL). The independent variables are basically the log of real average labor cost (lnravgLC) and the log of real value-added (lnrVA). According to the results of this baseline estimation, an increase in the average labor costs lead to a decline in the labor demand of paid employees and an increase in the value-added yield a rise in the labor demand of paid employees. Numerically, a 10 percentage increase in average labor cost lead to 3 percentage decrease in labor demand and 10 percentage increase in value-added lead to 2.6 percentage increase in labor demand. Thus, the estimation results for the base specification are in accordance with the expectations of basic static neoclassical theory of labor demand (see Chapter 3). Additionally, year effects are included into the estimation and as it is seen from Table 6.1, they also affect the labor demand level statistically significantly. That means, there are unobserved heterogeneities within the establishments which are time-invariant and establishment-specific. That's why a two-way fixed effects model is used as the estimator. Lastly, since these specifications are in log-log form, we interpret the relevant estimated coefficients as labor demand elasticities for long-run. Therefore, the long-run labor cost elasticity of labor demand is -0.29 and the long-run output elasticity of labor demand is 0.26.[106]

[106] Taymaz (2006) states that the estimates of long-run elasticities for the Turkish manufacturing sector varies between -0.09 and -0.57 in the literature.

In the second column of the Table 6.1, the real average labor costs (lnravgLC) are included in the estimation by decomposing it into real average wages (lnravgW) and real average labor tax of employers (lnravgLT). This decomposition is necessary in order to disentangle the effects of labor taxes on the labor demand. Accordingly, as expected, an increase in the average wages and in the average labor tax yield decreases in the labor demand. However, the magnitudes of their effects are different then the results of first column. While a 10 percentage increase in average labor tax decrease the labor demand by 0.3 percentages, a 10 percentage increase in average wages decrease the labor demand by 2.6 percentages. Thus, inherently, the impact of wages surpasses the labor tax. For the effect of value-added, we find a similar result with the first estimation. The increase of value-added provides a statistically significant increase in the labor demand. A 10 percentage increase in value-added results with a 2.6 percentage increase in the labor demand. Again the time dummies have significant effects on the labor demand. Here, again we infer the estimated coefficients as conditional labor demand elasticities in the long-run. Accordingly, the estimated long-run wage elasticity of labor demand is -0.26, the long-run labor tax elasticity of labor demand is -0.03 and the long-run output elasticity of labor demand is 0.26.

Table 6.1 Static Estimation Results for Base Specifications

	(1) lnPaidL		(2) lnPaidL	
lnravgLC	-0.293***	(-60.01)		
lnrVA	0.259***	(125.55)	0.258***	(125.30)
2006.YEAR	0.038***	(11.28)	0.039***	(11.34)
2007.YEAR	0.103***	(30.09)	0.103***	(30.12)
2008.YEAR	0.136***	(39.31)	0.137***	(39.25)
2009.YEAR	0.087***	(25.12)	0.089***	(25.02)
2010.YEAR	0.148***	(41.48)	0.149***	(41.08)
2011.YEAR	0.171***	(47.39)	0.173***	(46.90)
lnravgW			-0.259***	(-46.58)
lnravgLT			-0.029***	(-8.36)
Constant	3.204***	(68.73)	3.069***	(67.63)
Observations	64698		64655	
F	2877.092		2547.737	
p	0.000		0.000	
r2	0.294		0.293	

t statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6.2. Specifications for International Trade

Empirical specifications to estimate the labor demand functions considering the effects of international trade on both labor demand and labor demand elasticities are designed in a similar manner with the baseline specifications mentioned in the previous subchapter (Equations 6.3 and 6.5). The focus in these estimations is to choose the appropriate international trade-related exogenous variables which are added into the specifications and to estimate their effects on labor demand and labor demand elasticities. For explanatory variables, with available variables extracted from our dataset, total international trade volume, total exports volume, total imports volume, export share and import share in total trade/value-added/production value (at intensive margin), and international trade dummies, taking 1 for trading (export and/or import) firms, otherwise 0, at extensive margin are used in relevant estimations.

6.2.1. Findings for International Trade

Following the static empirical specifications in which the explanatory variables are added into the estimations in an additive or an interactive way (see Equations 6.3 and 6.5), the long-run impact of international trade on both the labor demand and labor demand elasticities are explored with the estimation results in this subchapter.

In Table 6.2, first, the summary of these estimation results for additively specified equations are presented. For our main explanatory variables, labor costs and value-added, we get similar results with our base estimations presented above. Labor costs decrease and value-added increase the labor demand of paid employees in the manufacturing sector for the long-run. For the international trade-related explanatory variables, there are several variables need to be assessed for the extensive and intensive margins. The log of real total trade volume (lnrT), the share of total trade in the production-value (TRatio_2), the log of real export volume (lnrX), the log of real import volume (lnrM), the share of export volume in the total trade volume (XRatio), the share of export volume in the value-added (XRatio2), the share of export volume in the

production-value (XRatio3), the share of import volume in total trade volume (MRatio), the share of import volume in the value-added (MRatio2), the share of import volume in the production-value (MRatio3), the dummy which takes 1 for trading establishments (TDummy), the dummy which takes 1 for exporting establishments (XDummy) and the dummy which takes 1 for importing establishments (MDummy) are used as international trade-related exogenous variables in the estimations. Besides, in order to grasp an idea about the effects of the domestic sources of substitution possibilities for workers on the labor demand, the share of employment agency expenditures in total expenditures (exp_agency), the share of subcontractor expenditures in total expenditures (exp_subcont) and the share of contract manufacturing expenditures in total expenditures (exp_contract) are added into the specifications and estimated separately. These last three explanatory variables are not directly related with international trade. However, they may be considered as the domestic alternatives which may have a similar effect on the labor demand as international trade. This is actually to test the hypothesis about the substitution possibilities. Accordingly, international trade may impact labor markets even though its share is small in most industries. Increasing threat of substitution either sourced from domestic or foreign factors could increase labor demand elasticities. This is why we add them into the regressions and explore whether they alter the labor demand and labor demand elasticities.

Overall, for the long-run effects of international trade on labor demand, we get positive and significant results for each trade related variable, except the XRatio (see Tables 6.2-6.6). This generally means that engaging in international trade activities (export and/or import) of an establishment and increases in the volume of international trade in terms of both exports and imports stimulate the labor demand incentives of establishments in the Turkish manufacturing sector for the period 2005-2011.

The independent variables which are put into the estimations to test the significance of the domestic substitution possibilities of workers give negative results in parallel our theoretical expectations (see Table 6.7). If the establishments tend to prefer using subcontractors or tend to make some parts of its production with contract manufacturing, then they tend to employ less permanent workers considering the labor costs, particularly considering labor taxes. Our findings also verify this mechanism.

Table 6.2 Static Estimation Results for Total Trade Volume (Additively Specified)

	(1) lnPaidL		(2) lnPaidL	
lnravgLC	-0.287***	(-51.03)	-0.292***	(-59.95)
lnrVA	0.233***	(95.51)	0.259***	(125.64)
lnrT	0.030***	(28.00)		
2006.YEAR	0.027***	(6.84)	0.038***	(11.26)
2007.YEAR	0.095***	(23.47)	0.103***	(30.06)
2008.YEAR	0.127***	(30.91)	0.136***	(39.26)
2009.YEAR	0.078***	(18.92)	0.087***	(25.02)
2010.YEAR	0.142***	(33.43)	0.148***	(41.36)
2011.YEAR	0.165***	(38.26)	0.171***	(47.17)
TRatio_2			0.020***	(5.79)
Constant	3.208***	(58.02)	3.194***	(68.51)
Observations	49458		64698	
F	1871.226		2562.638	
p	0.000		0.000	
r2	0.290		0.294	

t statistics in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

In Table 6.2, the static estimation results for the effects of international trade volume are presented. These results are the outcomes of the two-way static fixed-effects estimations which are considering both time and individual effects simultaneously. The additive specification presented in Equation 6.3 is estimated with these panel regressions. Accordingly, the total international trade volume and the share of total trade in the production-value increase the labor demand as a labor demand shifter in the long-run as it is clear in both columns of Table 6.2. Thus, increasing international trade volume increases the labor demand of a given establishment in the Turkish manufacturing sector without any change in the labor costs and in the output of this establishment.

Similar estimation is conducted to test the effects of total export and import volumes on labor demand. Estimation results are presented in Table 6.3. By these empirical findings, again, total exports and imports have increasing long-run effects on the labor demand for a given establishment in the Turkish manufacturing sector. Here, also, the labor demand shifter effect of international trade works similarly. These estimations are also specified following Equation 6.3 and estimated with a static fixed-effect estimator considering both time and individual effects.

Table 6.3 Static Estimation Results for Export and Import Volumes (Additively Specified)

	(1) lnPaidL		(2) lnPaidL	
lnravgLC	-0.286***	(-45.77)	-0.290***	(-47.74)
lnrVA	0.234***	(85.69)	0.233***	(86.99)
lnrX	0.017***	(16.31)		
2006.YEAR	0.027***	(6.03)	0.023***	(5.28)
2007.YEAR	0.099***	(21.97)	0.094***	(21.12)
2008.YEAR	0.134***	(29.02)	0.123***	(27.33)
2009.YEAR	0.083***	(18.06)	0.083***	(18.23)
2010.YEAR	0.152***	(31.95)	0.147***	(31.50)
2011.YEAR	0.181***	(37.25)	0.169***	(35.68)
lnrM			0.029***	(27.79)
Constant	3.400***	(54.94)	3.341***	(55.34)
Observations	40039		42648	
F	1428.260		1569.417	
p	0.000		0.000	
r2	0.283		0.288	

t statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6.4 Static Estimation Results for Export Ratios (Additively Specified)

	(1) lnPaidL		(2) lnPaidL		(3) lnPaidL	
lnravgLC	-0.287***	(-50.58)	-0.294***	(-60.40)	-0.292***	(-59.98)
lnrVA	0.246***	(101.81)	0.262***	(126.28)	0.259***	(125.55)
XRatio	-0.026***	(-4.87)				
2006.YEAR	0.030***	(7.32)	0.038***	(11.05)	0.038***	(11.26)
2007.YEAR	0.098***	(24.13)	0.102***	(29.93)	0.103***	(30.06)
2008.YEAR	0.131***	(31.67)	0.135***	(39.12)	0.136***	(39.23)
2009.YEAR	0.083***	(19.89)	0.087***	(24.99)	0.087***	(24.93)
2010.YEAR	0.150***	(35.07)	0.147***	(41.32)	0.148***	(41.36)
2011.YEAR	0.177***	(40.76)	0.170***	(47.07)	0.171***	(47.22)
XRatio2			0.000***	(12.51)		
XRatio3					0.020***	(3.86)
Constant	3.443***	(62.27)	3.171***	(68.03)	3.200***	(68.65)
Observations	49458		64698		64698	
F	1754.417		2581.972		2559.714	
p	0.000		0.000		0.000	
r2	0.277		0.296		0.294	
r2_a	0.132		0.177		0.175	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6.4 presents the estimation results for three differently described export ratios, namely the share of export volume in the total trade volume (XRatio), the share of export volume in the value-added (XRatio2), the share of export volume in the production-value (XRatio3). According to these estimation results, the share of export volume in the value-added or in the production-value has a significantly positive effect on the labor demand of paid employment in the Turkish manufacturing sector. However, the share of export volume in the total trade volume has a significant but negative effect on the labor demand (see column 1). This negative effect may be explained with the productivity concerns of exporting establishments. Since these firms compete in the international markets heavily with production costs, lowering their labor costs is one of the first options to be competitive in international markets. Thus they use more labor saving technologies than other firms. Table 6.5 displays the similar estimation results for three different import ratios mentioned above. Accordingly, they positively and significantly affect the labor demand of establishments for paid employees in the long-run. This is mostly due to increasing import dependent production structures of the establishments in the Turkish manufacturing sector between 2005 and 2011.

Table 6.5 Static Estimation Results for Import Ratios (Additively Specified)

	(1) lnPaidL		(2) lnPaidL		(3) lnPaidL	
lnravgLC	-0.287***	(-50.58)	-0.298***	(-61.36)	-0.292***	(-59.95)
lnrVA	0.246***	(101.81)	0.270***	(128.86)	0.259***	(125.67)
MRatio	0.026***	(4.87)				
2006.YEAR	0.030***	(7.32)	0.037***	(10.95)	0.038***	(11.28)
2007.YEAR	0.098***	(24.13)	0.101***	(29.78)	0.103***	(30.09)
2008.YEAR	0.131***	(31.67)	0.134***	(38.94)	0.136***	(39.33)
2009.YEAR	0.083***	(19.89)	0.086***	(24.92)	0.088***	(25.22)
2010.YEAR	0.150***	(35.07)	0.146***	(41.22)	0.148***	(41.46)
2011.YEAR	0.177***	(40.76)	0.169***	(46.83)	0.171***	(47.29)
MRatio2			0.004***	(25.63)		
MRatio3					0.032***	(5.62)
Constant	3.418***	(61.84)	3.097***	(66.56)	3.194***	(68.49)
Observations	49458		64698		64698	
F	1754.417		2660.710		2562.344	
p	0.000		0.000		0.000	
r2	0.277		0.302		0.294	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

To examine the effects of international trade on labor demand, in addition to the variables at the intensive margin, Table 6.6 reports the estimation results of international trade-related variables at the extensive margin. Dummy variables which take 1 for trading establishments (TDummy), which take 1 for exporting establishments (XDummy) and which take 1 for importing establishments (MDummy) are estimated separately for each specification of labor demand function. The results of these additively specified estimations imply that being an establishment with trading activities, export or import, create a labor demand increasing effect at the extensive margin. In other words, establishments engaged in international trade activities are more propone to demand paid employee than establishments which do not deal with any international trade activity. This positive effect is slightly higher for the importing establishments than exporting ones. This is mostly because importing establishments heavily use the imported intermediate inputs to produce final goods for the domestic markets or to export them into the world market. Exporting establishments may provide their production inputs from importing establishments or by themselves, and so they may substitute domestic labor with imported intermediate inputs.

Table 6.6 Static Estimation Results for Trade Dummies (Additively Specified)

	(1) lnPaidL		(2) lnPaidL		(3) lnPaidL	
lnravgLC	-0.292***	(-60.06)	-0.292***	(-60.04)	-0.292***	(-59.96)
lnrVA	0.257***	(124.53)	0.258***	(125.04)	0.256***	(124.23)
TDummy	0.046***	(13.71)				
2006.YEAR	0.038***	(11.22)	0.038***	(11.21)	0.038***	(11.25)
2007.YEAR	0.103***	(29.98)	0.103***	(30.02)	0.103***	(29.98)
2008.YEAR	0.136***	(39.21)	0.136***	(39.26)	0.136***	(39.40)
2009.YEAR	0.087***	(24.98)	0.086***	(24.93)	0.088***	(25.40)
2010.YEAR	0.147***	(41.31)	0.147***	(41.33)	0.148***	(41.53)
2011.YEAR	0.171***	(47.27)	0.171***	(47.32)	0.171***	(47.45)
XDummy			0.035***	(9.99)		
MDummy					0.054***	(14.92)
Constant	3.205***	(68.89)	3.195***	(68.60)	3.195***	(68.68)
Observations	64698		64698		64698	
F	2586.951		2573.062		2592.367	
p	0.000		0.000		0.000	
r2	0.296		0.295		0.297	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The last additively specified estimation in this subchapter is for the variables related with the domestic substitution possibilities. As discussed earlier, in order to understand whether employment agencies, subcontractors and contract manufacturing have an effect on the labor demand, their shares in total expenditures of establishments in the manufacturing sector are estimated using again the baseline labor demand specifications. The results of Table 6.7 shows that if the shares for employment agencies, subcontractors and contract manufacturing increase in the expenditures of establishments, these establishments decrease the labor demand for paid employees in the long-run. These results imply that manufacturing establishments using these kinds of alternative domestic employment schemes prefer not to employ paid employee for their own. The major motivation behind this negative labor demand incentive is again concerns about labor costs. Substituting paid employees with subcontractors or covering the production with contract manufacturing lowers the labor costs of establishments in the Turkish manufacturing sector.

Table 6.7 Static Estimation Results for Domestic Substitutions (Additively Specified)

	(1) lnPaidL		(2) lnPaidL		(3) lnPaidL	
lnravgLC	-0.292***	(-59.91)	-0.292***	(-60.00)	-0.292***	(-59.98)
lnrVA	0.259***	(125.55)	0.259***	(125.63)	0.259***	(125.55)
exp_agency	-0.478***	(-3.98)				
2006.YEAR	0.039***	(11.31)	0.038***	(11.29)	0.038***	(11.28)
2007.YEAR	0.103***	(30.13)	0.102***	(29.86)	0.103***	(29.81)
2008.YEAR	0.136***	(39.36)	0.136***	(39.07)	0.136***	(39.32)
2009.YEAR	0.087***	(25.06)	0.086***	(24.88)	0.087***	(25.12)
2010.YEAR	0.148***	(41.40)	0.147***	(41.20)	0.148***	(41.48)
2011.YEAR	0.171***	(47.31)	0.170***	(47.07)	0.171***	(47.35)
exp_subcont			-0.189***	(-5.12)		
exp_contract					-0.029	(-1.43)
Constant	3.200***	(68.66)	3.202***	(68.72)	3.203***	(68.71)
Observations	64698		64698		64698	
F	2559.862		2561.499		2557.690	
p	0.000		0.000		0.000	
r2	0.294		0.294		0.294	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Therefore, these estimation results of additively specified equations presented so far provide us an intuition about the direct effects of international trade on labor demand, so on the labor market. To sum so far, it is not incorrect to comment that international trade has a positive direct effect on the level of labor demand both at intensive and extensive margins. However, the extent of this positive effect is not the issue of this research.[107]

The findings for the interactively specified functions are presented in the remaining of this subchapter. These are the estimation results of the empirical models which are interactively specified as formulated in Equation 6.5 and they are again estimated with the two-way static fixed effects estimator. The aim with these interactions is to capture the effects of internationalization on the labor demand elasticities. In the results of these static estimations, different models are specified interactively between the main variables (labor costs and value added) in our baseline specification and other international trade related explanatory variables we are interested in this part of the study. In these regressions, again the dependent variable is the log of paid employees (lnPaidL), the main independent variables are the log of real average labor cost (lnravgLC) and the log of real value-added (lnrVA). As the international trade related variables, we again use the log of real total international trade volume (lnrT), the share of total international trade in the production value (TRatio_2), the log of real export volume (lnrX), the log of real import volume (lnrM), the share of export volume in the total trade volume (XRatio), the share of export volume in the total value-added (XRatio2), the share of export volume in the production-value (XRatio3), the share of import volume in the total trade volume (MRatio), the share of import volume in the total value-added (MRatio2), the share of import volume in the production value (MRatio3), and the dummy variables which take the value of 1 if the establishment is trading (TDummy), or if the establishment is exporting (XDummy), or if the establishment is importing (MDummy), otherwise 0. To control for the time-invariant unobserved effects we also added the year dummies for 2006-2011 period. For the unobserved heterogeneity among establishments we employed the fixed effects model, so we aim to capture both effects.

[107] See Lo Turco and Maggioni (2013) for a recent discussion about international trade and employment growth.

Table 6.8 Static Estimation Results for Total Trade Volume (Interactively Specified)

	(1) lnPaidL		(2) lnPaidL	
lnravgLC	-0.187***	(-7.10)	-0.290***	(-55.50)
lnrVA	0.134***	(12.96)	0.257***	(115.76)
lnrT	-0.004	(-0.24)		
c.lnrT#c.lnravgLC	-0.007***	(-3.87)		
c.lnrT#c.lnrVA	0.007***	(9.83)		
2006.YEAR	0.027***	(6.71)	0.038***	(11.24)
2007.YEAR	0.095***	(23.50)	0.103***	(30.06)
2008.YEAR	0.126***	(30.69)	0.136***	(39.23)
2009.YEAR	0.077***	(18.73)	0.087***	(24.97)
2010.YEAR	0.140***	(33.13)	0.148***	(41.32)
2011.YEAR	0.162***	(37.60)	0.171***	(47.09)
TRatio_2			0.034	(0.50)
c.TRatio_2#c.lnravgLC			-0.009	(-1.24)
c.TRatio_2#c.lnrVA			0.005	(1.62)
Constant	3.655***	(16.50)	3.190***	(64.37)
Observations	49458		64698	
F	1543.308		2097.068	
p	0.000		0.000	
r2	0.292		0.294	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

According to the estimation results of Table 6.8, the total international trade volume of the establishments in the manufacturing sector significantly alters their both the labor cost elasticity and output elasticity of labor demand in the long-run. Thus, international trade both increases the labor cost and output elasticities of labor demand. This is in accordance with the hypothesis of Rodrik (1997). So, the inference about the roles of international trade on labor demand elasticities resulting with this estimation is consistent with theoretical expectations. Since, theoretically, the role of international trade is to constitute a substitution possibility effect against domestic labor in terms of production inputs, the increment in the labor cost elasticity of labor demand is an important signal for this effect in the long-run. But these estimation results are not adequate to argue that these increases in the elasticities imply job insecurity and low bargaining power for unskilled labor in the Turkish manufacturing sector. Further empirical studies in those issues are required to prove these empirical claims. However,

international trade volume does not significantly increase the labor demand as a shifter in this specification. Moreover, the share of total international trade volume in the production value does not statistically significantly affect the labor demand and labor demand elasticities according to estimation results presented in the second column of Table 6.8. Overall, all the effects of international trade volume have shifted to the labor demand elasticities given they are controlled for labor demand in the long-run.

Table 6.9 gives the results of estimation for export and import volumes which are interactively specified to disentangle the effects of export and import volumes on the labor demand elasticities. Accordingly, higher export volume leads to higher long-run labor cost and output elasticities of labor demand. Moreover, export volume has a direct statistically significant positive effect on the labor demand of establishments in the manufacturing sector. Note that, this direct positive effect of exports on labor demand is higher than the contribution of exports to the output elasticity of labor demand. This may imply the productivity improvements arising from exports. In other words, higher productivity may lead to higher competitiveness and to expansion in firms' outputs and market share. So it may positively affect the employment levels of firms. However, exports may not increase the output elasticity of labor demand in the manufacturing sector due to labor intensity decreasing effects of labor-saving technologies.

However, increasing import volume decreases the labor demand. However, the effect of imports volume on the labor cost elasticity of labor demand is not statistically significant. The economic significance behind this coefficient may be on the dichotomy between intensive and extensive margins. While the volume of imports are not influential on the labor cost elasticity of labor demand, whether being or not an importer can create a difference for the elasticity. However, higher import volume leads to a higher long-run output elasticity of labor demand. Although direct effect of importing seems to have a negative effect on the employment levels of firms, its limited contribution to the output elasticity of labor demand has a positive effect on the labor demand. These may stem from the variety of importing firms in the manufacturing sector. While some of importing firms use imported intermediate inputs to produce final products and sell them in the domestic or in the world markets, others prefer to sell imported goods directly to the domestic markets. These imports may create substitution effect for domestic labor, but the output elasticity of labor demand increases.

Table 6.9 Static Estimation Results for Export and Import Volumes (Interactively Specified)

	(1) lnPaidL		(2) lnPaidL	
lnravgLC	-0.152***	(-6.13)	-0.267***	(-10.76)
lnrVA	0.218***	(22.78)	0.156***	(15.48)
lnrX	0.091***	(6.30)		
c.lnrX#c.lnravgLC	-0.010***	(-5.55)		
c.lnrX#c.lnrVA	0.001*	(1.68)		
2006.YEAR	0.027***	(5.99)	0.023***	(5.18)
2007.YEAR	0.099***	(22.00)	0.093***	(21.07)
2008.YEAR	0.134***	(29.00)	0.123***	(27.18)
2009.YEAR	0.083***	(18.02)	0.083***	(18.19)
2010.YEAR	0.152***	(31.88)	0.146***	(31.28)
2011.YEAR	0.181***	(37.16)	0.167***	(35.17)
lnrM			-0.036**	(-2.35)
c.lnrM#c.lnravgLC			-0.002	(-0.95)
c.lnrM#c.lnrVA			0.006***	(7.90)
Constant	2.404***	(11.92)	4.190***	(19.82)
Observations	40039		42648	
F	1172.587		1292.816	
p	0.000		0.000	
r2	0.284		0.290	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

In Table 6.10, the estimation results for the interaction of export ratios with the main explanatory variables are given. Accordingly, the share of export volume in the total trade volume does not significantly alter the labor demand elasticities. However, the share of export volume in the total value-added increases both the labor cost and output elasticities of labor demand. Additionally, it shifts the labor demand outward from the origin. The share of export volume in the production-value has a similar effect on labor demand and on the labor cost elasticity of labor demand, but its effect on the output elasticity of labor demand is not statistically significant. As the exports' role on the production structure of a given establishment emphasized above, in a similar vein, these results imply that the share of exports in value-added and in production value have importance on the modifications of labor demand elasticities rather than the share of exports in total trade volume. Therefore, this is also due to the role of exports on the productivity and on the production scales of firms.

Table 6.10 Static Estimation Results for Export Ratios (Interactively Specified)

	(1) lnPaidL		(2) lnPaidL		(3) lnPaidL	
lnravgLC	-0.285***	(-37.70)	-0.294***	(-60.50)	-0.289***	(-55.83)
lnrVA	0.246***	(78.13)	0.265***	(126.91)	0.259***	(117.52)
XRatio	0.022	(0.25)				
c.XRatio#c.lnravgLC	-0.003	(-0.32)				
c.XRatio#c.lnrVA	-0.001	(-0.30)				
2006.YEAR	0.030***	(7.31)	0.038***	(11.05)	0.038***	(11.26)
2007.YEAR	0.098***	(24.13)	0.102***	(29.74)	0.103***	(30.07)
2008.YEAR	0.131***	(31.67)	0.135***	(39.01)	0.136***	(39.25)
2009.YEAR	0.083***	(19.90)	0.086***	(24.86)	0.087***	(24.95)
2010.YEAR	0.150***	(35.07)	0.146***	(41.09)	0.148***	(41.37)
2011.YEAR	0.177***	(40.76)	0.169***	(46.78)	0.171***	(47.24)
XRatio2			0.003***	(6.73)		
c.XRatio2#c.lnravgLC			-0.001***	(-9.08)		
c.XRatio2#c.lnrVA			0.000***	(11.18)		
XRatio3					0.306***	(2.86)
c.XRatio3#c.lnravgLC					-0.023*	(-1.87)
c.XRatio3#c.lnrVA					-0.005	(-1.03)
Constant	3.420***	(49.15)	3.137***	(67.23)	3.161***	(64.79)
Observations	49458		64698		64698	
F	1435.404		2129.668		2095.177	
p	0.000		0.000		0.000	
r2	0.277		0.297		0.294	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Similar estimations for import ratios give similar results with export ratios. Table 6.11 summarizes the results of these estimations. Regarding these results, the share of import volume in the total international trade volume does not alter the labor demand and labor demand elasticities significantly. But the share of import volume in the total value-added has a positive effect on both labor cost and output elasticities of labor demand. However, the share of import volume in the production-value has just an increasing effect on the output elasticity of labor demand and on the labor demand, but not on the labor cost elasticity of labor demand. These results for import ratios are also in line with the results of export ratios. Imports' role on the production structure of manufacturing establishments is frequently linked with the increasing substitution possibilities of domestic labor, so they alter the labor demand elasticities.

Table 6.11 Static Estimation Results for Import Ratios (Interactively Specified)

	(1) lnPaidL		(2) lnPaidL		(3) lnPaidL	
lnravgLC	-0.289***	(-36.03)	-0.297***	(-61.24)	-0.291***	(-57.96)
lnrVA	0.245***	(74.50)	0.273***	(130.12)	0.256***	(120.25)
MRatio	-0.022	(-0.25)				
c.MRatio#c.lnravgLC	0.003	(0.32)				
c.MRatio#c.lnrVA	0.001	(0.30)				
2006.YEAR	0.030***	(7.31)	0.037***	(10.93)	0.038***	(11.22)
2007.YEAR	0.098***	(24.13)	0.101***	(29.55)	0.103***	(30.06)
2008.YEAR	0.131***	(31.67)	0.134***	(38.84)	0.136***	(39.32)
2009.YEAR	0.083***	(19.90)	0.086***	(24.84)	0.088***	(25.27)
2010.YEAR	0.150***	(35.07)	0.145***	(40.97)	0.148***	(41.40)
2011.YEAR	0.177***	(40.76)	0.167***	(46.42)	0.171***	(47.12)
MRatio2			0.013***	(5.38)		
c.MRatio2#c.lnravgLC			-0.002***	(-6.00)		
c.MRatio2#c.lnrVA			0.001***	(14.53)		
MRatio3					-0.179*	(-1.84)
c.MRatio3#c.lnravgLC					-0.006	(-0.61)
c.MRatio3#c.lnrVA					0.020***	(4.55)
Constant	3.443***	(47.62)	3.034***	(65.05)	3.215***	(67.10)
Observations	49458		64698		64698	
F	1435.404		2210.103		2099.055	
p	0.000		0.000		0.000	
r2	0.277		0.305		0.294	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

For the effects of international trade on the labor demand elasticities at the extensive margin, dummy variables taking 1 for trading, exporting and importing establishments are also estimated interactively with the explanatory variables. Table 6.12 provides the results for these estimations with dummy variables interacted with our main explanatory variables. While export dummies have a decreasing effect both on the labor cost and output elasticities of labor demand, import dummies have just negatively influential on the labor cost elasticity of labor demand. But none of the dummies have a statistically significant direct effect on the labor demand. Therefore, the effects of being an exporter or an importer firm on labor demand elasticities are different than the effects of volumes or ratios of exports and imports on labor demand elasticities. Since these firms dealt with international trade activities are larger scaled than other firms, their responsiveness to the labor costs and output in terms of employment might be small.

Table 6.12 Static Estimation Results for Trade Dummies (Interactively Specified)

	(1) lnPaidL		(2) lnPaidL		(3) lnPaidL	
lnravgLC	-0.296***	(-46.99)	-0.304***	(-44.45)	-0.303***	(-39.73)
lnrVA	0.258***	(101.33)	0.264***	(95.46)	0.257***	(80.20)
1.TDummy	0.038	(0.65)				
1.TDummy#c.lnravgLC	0.006	(0.83)				
1.TDummy#c.lnrVA	-0.003	(-1.14)				
2006.YEAR	0.038***	(11.23)	0.038***	(11.23)	0.038***	(11.26)
2007.YEAR	0.103***	(29.98)	0.103***	(30.02)	0.103***	(29.97)
2008.YEAR	0.136***	(39.21)	0.136***	(39.28)	0.136***	(39.38)
2009.YEAR	0.087***	(24.99)	0.087***	(24.96)	0.088***	(25.41)
2010.YEAR	0.147***	(41.32)	0.148***	(41.34)	0.148***	(41.54)
2011.YEAR	0.171***	(47.29)	0.171***	(47.37)	0.171***	(47.46)
1.XDummy			0.009	(0.15)		
1.XDummy#c.lnravgLC			0.018**	(2.46)		
1.XDummy#c.lnrVA			-0.010***	(-3.42)		
1.MDummy					-0.075	(-1.04)
1.MDummy#c.lnravgLC					0.015*	(1.84)
1.MDummy#c.lnrVA					-0.001	(-0.16)
Constant	3.212***	(56.53)	3.216***	(52.96)	3.285***	(48.12)
Observations	64698		64698		64698	
F	2116.708		2106.814		2121.428	
p	0.000		0.000		0.000	
r2	0.296		0.295		0.297	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Lastly, Table 6.13 shows the results of estimations for domestic substitution possibilities interactively specified again with the labor cost and value-added variables. While subcontracting has statistically significant negative effects on both labor cost and output elasticities of labor demand in the long-run, employment agencies has just a negative and significant effect on the output elasticity of labor demand. However, contract manufacturing has positive and statistically significant effects on both labor cost and output elasticities of labor demand. Particularly, contract manufacturing creates a strong substitution effect for establishments in the manufacturing sector by adding extra employment possibilities in a cheaper way. Thus unfortunately, increasing the labor cost elasticity of labor demand implies unfavorable working conditions for labor.

Table 6.13 Static Estimation Results for Domestic Substitutions (Interactively Specified)

	(1) lnPaidL		(2) lnPaidL		(3) lnPaidL	
lnravgLC	-0.292***	(-59.88)	-0.293***	(-59.72)	-0.283***	(-56.41)
lnrVA	0.259***	(125.65)	0.260***	(125.23)	0.256***	(120.66)
exp_agency	4.431**	(2.36)				
c. exp_agency#c.lnravgLC	0.209	(1.09)				
c. exp_agency#c.lnrVA	-0.486***	(-4.75)				
2006.YEAR	0.039***	(11.35)	0.038***	(11.30)	0.039***	(11.33)
2007.YEAR	0.103***	(30.16)	0.102***	(29.84)	0.104***	(30.11)
2008.YEAR	0.137***	(39.41)	0.135***	(39.05)	0.137***	(39.52)
2009.YEAR	0.087***	(25.06)	0.086***	(24.87)	0.088***	(25.30)
2010.YEAR	0.148***	(41.39)	0.147***	(41.19)	0.149***	(41.78)
2011.YEAR	0.171***	(47.30)	0.170***	(47.02)	0.172***	(47.64)
exp_subcont			0.448	(0.93)		
c.exp_subcont#c.lnravgLC			0.114*	(1.74)		
c.exp_subcont#c.lnrVA			-0.119***	(-3.49)		
exp_contract					1.564***	(4.21)
c.exp_contract#c.lnravgLC					-0.346***	(-7.76)
c.exp_contract#c.lnrVA					0.113***	(6.14)
Constant	3.197***	(68.54)	3.197***	(68.31)	3.163***	(66.45)
Observations	64698		64698		64698	
F	2097.317		2097.307		2101.496	
p	0.000		0.000		0.000	
r2	0.294		0.294		0.295	
r2_a	0.175		0.175		0.175	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6.3. Specifications for International Outsourcing

In order to analyze the effects of international outsourcing on labor demand and labor demand elasticities, we add imported intermediate input share into the baseline specifications. The static specification includes international outsourcing variable as both labor demand shifter and slope changer:

[6.7]

$$lnL_{i,t} = \alpha_{i,t} + \beta_1 lnw_{i,t} + \beta_2 lnY_{i,t} + \gamma O_{i,t} + \beta_3 O_{i,t} lnw_{i,t} + \beta_4 O_{i,t} lnY_{i,t} + \varepsilon_{i,t}$$

where O denotes the share of imported intermediate input in the total value-added. The dynamic specification again includes lag of employment, total labor costs and output:

[6.8]

$$lnL_{i,t} = \alpha_{i,t} + \delta lnL_{i,t}(-1) + \beta_1 lnw_{i,t} + \beta_1^{`} lnw_{i,t}(-1) + \beta_2 lnY_{i,t} + \beta_2^{`} lnY_{i,t}(-1) + \gamma_k O_{i,t} + \beta_3 O_{i,t} lnw_{i,t} + \beta_3^{`} O_{i,t} lnw_{i,t}(-1) + \beta_4 O_{i,t} lnY_{i,t} + \beta_4^{`} O_{i,t} lnY_{i,t}(-1) + \varepsilon_{i,t}$$

where O is added into the specification again both additively and interactively.

6.3.1. Findings for International Outsourcing

In order to understand the effects of international outsourcing on the labor demand and on the labor demand elasticities, we need to use proxies for outsourcing. In this study, the share of imported intermediate input is used as the proxy for international outsourcing. Since the usage of imported intermediate inputs in the production process may be thought as the usage of foreign labor instead of domestic labor, we expect that this international substitution mechanism lead to an increase in labor demand elasticities, particularly for labor cost elasticities. On the other hand, since the production process in the manufacturing sectors of developing countries like Turkey tightly coupled with the imported intermediate inputs, this may increase the production and so employment of domestic workers. Therefore, there are two contradictory forces.

Three proxy variables are tested to grasp the effects of international outsourcing on the labor demand. The share of imported intermediate input in total import volume (IntImpShare), the share of imported intermediate input in total trade volume (IntImpShare_2) and the share of imported intermediate input in production-value (IntImpShare_3) are used in the estimations. Table 6.14 summarizes the estimation results for the additive static specifications following the Equation 6.3. Accordingly, the impact of international outsourcing on the labor demand as a shifter is significantly positive for each result. That means increasing imported intermediate inputs stimulate

the production levels of establishments and so the employment incentives of establishments in the Turkish manufacturing sector.

Table 6.14 Static Estimation Results for International Outsourcing (Additively Specified)

	(1) lnPaidL		(2) lnPaidL		(3) lnPaidL	
lnravgLC	-0.291***	(-47.23)	-0.287***	(-50.58)	-0.292***	(-59.96)
lnrVA	0.246***	(92.27)	0.246***	(101.85)	0.259***	(125.62)
IntImpShare	0.007	(1.26)				
2006.YEAR	0.024***	(5.39)	0.029***	(7.26)	0.038***	(11.21)
2007.YEAR	0.095***	(21.21)	0.097***	(23.98)	0.103***	(29.97)
2008.YEAR	0.124***	(27.14)	0.130***	(31.50)	0.136***	(39.24)
2009.YEAR	0.078***	(16.85)	0.082***	(19.62)	0.087***	(25.18)
2010.YEAR	0.150***	(31.75)	0.149***	(34.90)	0.148***	(41.35)
2011.YEAR	0.177***	(36.88)	0.176***	(40.63)	0.170***	(47.13)
IntImpShare_2			0.023***	(4.25)		
IntImpShare_3					0.086***	(9.02)
Constant	3.532***	(58.14)	3.421***	(61.93)	3.193***	(68.54)
Observations	42648		49458		64698	
F	1451.737		1753.544		2570.176	
p	0.000		0.000		0.000	
r2	0.272		0.277		0.295	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

For the impact of international outsourcing on the labor demand elasticities, we estimate the static specification which is interactively specified following the Equation 6.7. According to the estimation results presented in Table 6.15, the increase in the share of imported intermediate inputs in total import volume significantly alter both the labor cost elasticity of labor demand and the output elasticity of labor demand in a positive way. However, other two proxies for international outsourcing do not significantly affect the labor demand elasticities, except the positive effect for the share of imported intermediate inputs in total trade on the output elasticity of labor demand. Besides, they do not directly affect the labor demand as labor demand shifter. The critical point on these findings is the role of imported intermediate inputs in total import volume. As discussed earlier, this share gives important information for the extent of substitution of domestic labor with foreign labor indirectly.

Table 6.15 Static Estimation Results for International Outsourcing (Interactively Specified)

	(1) lnPaidL		(2) lnPaidL		(3) lnPaidL	
lnravgLC	-0.264***	(-25.48)	-0.280***	(-39.51)	-0.294***	(-56.96)
lnrVA	0.234***	(55.12)	0.242***	(82.37)	0.258***	(118.39)
IntImpShare	0.117	(1.23)				
c.IntImpShare#c.lnravgLC	-0.037***	(-3.14)				
c.IntImpShare#c.lnrVA	0.016***	(3.42)				
2006.YEAR	0.024***	(5.34)	0.029***	(7.23)	0.038***	(11.19)
2007.YEAR	0.095***	(21.16)	0.097***	(23.95)	0.103***	(29.95)
2008.YEAR	0.124***	(27.06)	0.130***	(31.48)	0.136***	(39.22)
2009.YEAR	0.077***	(16.77)	0.081***	(19.57)	0.087***	(25.19)
2010.YEAR	0.150***	(31.73)	0.149***	(34.85)	0.148***	(41.32)
2011.YEAR	0.177***	(36.83)	0.176***	(40.56)	0.170***	(47.07)
IntImpShare_2			0.037	(0.40)		
c.IntImpShare_2#c.lnravgLC			-0.018	(-1.59)		
c.IntImpShare_2#c.lnrVA			0.011**	(2.38)		
IntImpShare_3					-0.265	(-1.56)
c.IntImpShare_3#c.lnravgLC					0.022	(1.27)
c.IntImpShare_3#c.lnrVA					0.011	(1.40)
Constant	3.453***	(38.27)	3.414***	(52.61)	3.221***	(66.25)
Observations	42648		49458		64698	
F	1189.561		1435.407		2103.407	
p	0.000		0.000		0.000	
r2	0.273		0.277		0.295	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6.4. Specifications for Foreign Ownership

Similar empirical specifications are designed to include the effects of foreign ownership of firms on labor demand and labor demand elasticities. Unique difference with previous analyses is to include the foreign ownership variable into the specifications as a dummy variable. This dummy variable takes the value of 1 if the foreign capital share is 50% or above and 0 otherwise. The following static specification includes the foreign ownership dummy variable as both labor demand shifter and slope changer:

[6.9]

$$lnL_{i,t} = \alpha_{i,t} + \beta_1 lnw_{i,t} + \beta_2 lnY_{i,t} + \gamma FO_{i,t} + \beta_3 FO_{i,t} lnw_{i,t} + \beta_4 FO_{i,t} lnY_{i,t} + \varepsilon_{i,t}$$

where FO is a dummy variable takes 1 if an establishment's foreign capital share is 50% or above, otherwise it takes 0. The interaction of this variable with w and Y allows us to detect the differences for nationality of ownership in the labor cost and output elasticity. The dynamic specification again includes the lags of employment, labor costs and output and it is specified again both additively and interactively with foreign ownership dummy variable:

[6.10]

$$\begin{aligned} lnL_{i,t} = \alpha_{i,t} &+ \delta lnL_{i,t}(-1) + \beta_1 lnw_{i,t} + \beta_1^{`} lnw_{i,t}(-1) + \beta_2 lnY_{i,t} + \beta_2^{`} lnY_{i,t}(-1) \\ &+ \gamma_k FO_{i,t} + \beta_3 FO_{i,t} lnw_{i,t} + \beta_3^{`} FO_{i,t} lnw_{i,t}(-1) + \beta_4 FO_{i,t} lnY_{i,t} \\ &+ \beta_4^{`} FO_{i,t} lnY_{i,t}(-1) + \varepsilon_{i,t} \end{aligned}$$

6.4.1. Findings for Foreign Ownership

The third aspect with the internationalization of production process is the nationality of ownership. Since the firms' management behaviors generally vary among nations, we expect that the labor demand behaviors and incentives of multinational firms differ from the national firms. According to the empirical literature (see Chapter 4), our expectation is based on the evidences which claim that the foreign ownership leads to the increase in labor demand elasticities. In order to test this idea for the establishments in the Turkish manufacturing sector, the dummy variable which takes 1 for the establishments with foreign capital share exceeds 50 percentages is used (FO). Again, first additive and interactive specifications are estimated to examine whether foreign ownership leads to an increase in labor demand and in labor demand elasticities. According to the estimation results given in Table 6.16, the foreign ownership of establishments increases the labor demand and labor cost elasticity of labor demand and the estimation results are statistically significant. If we survey relevant literature (see Chapter 4), these results are also significant economically.

Table 6.16 Static Estimation Results for Foreign Ownership (Additively and Interactively Specified)

	(1) lnPaidL		(2) lnPaidL	
lnravgLC	-0.293***	(-60.08)	-0.292***	(-59.13)
lnrVA	0.259***	(125.56)	0.260***	(124.98)
FO	0.060***	(3.51)		
2006.YEAR	0.038***	(11.21)	0.038***	(11.22)
2007.YEAR	0.103***	(30.02)	0.103***	(30.03)
2008.YEAR	0.136***	(39.22)	0.136***	(39.23)
2009.YEAR	0.087***	(25.05)	0.087***	(25.07)
2010.YEAR	0.148***	(41.45)	0.148***	(41.45)
2011.YEAR	0.171***	(47.33)	0.171***	(47.35)
1.FO			0.972***	(5.02)
1.FO#c.lnravgLC			-0.041*	(-1.93)
1.FO#c.lnrVA			-0.033***	(-3.64)
Constant	3.205***	(68.77)	3.181***	(67.76)
Observations	64698		64698	
F	2559.309		2097.641	
p	0.000		0.000	
r2	0.294		0.294	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6.5. Calculation of the Long-Run Wage Elasticity of Labor Demand

The calculations of the long-run own-wage elasticities of labor demand from dynamic specifications are based on a standard procedure as the sum of the coefficients on the contemporaneous and lagged wage variable is divided by 1 minus the coefficient on lagged employment. For the base specification in the dynamic format (see Equation 6.4), we calculate the long-run wage elasticity of labor demand as follows:

[6.11]

$$\eta_{long-run} = \frac{(\beta_1 + \beta_1^{`})}{(1 - \delta)}$$

6.5.1. Findings for Dynamic Specifications

Thus far, the empirical specifications estimated were all in the static structure. However, employment or labor demand is a dynamic process (see Chapter 3) and its dynamics are tied with its past conjecture. So, it needs to be investigated with dynamic specifications. Following the Equation 6.4 which is in a dynamic structure but additively specified and the Equation 6.6 which is again in a dynamic form but interactively specified, in this subchapter, we estimate the labor demand functions to explore whether international trade has altered the labor demand and labor demand elasticities. Arellano-Bond (1991) dynamic panel data estimator is used in these estimations (see Chapter 5).

In Table 6.17, following the baseline specifications described, we estimate the dynamic labor demand function with one lag for each main variable in our basic labor demand model. Accordingly, the persistency in the labor demand is obvious with the estimated significant coefficient of lagged labor demand. Here, coefficients estimated for labor costs and value-added are the short-run elasticities. To calculate the long-run elasticities of labor demand, we follow the procedure described above.

Table 6.17 Dynamic Estimation Results for Base Specifications

	(1) lnPaidL		(2) lnPaidL	
L.lnPaidL	0.644***	(31.48)	0.642***	(31.39)
lnravgLC	-0.259***	(-47.30)		
L.lnravgLC	0.107***	(14.25)		
lnrVA	0.136***	(48.45)	0.135***	(48.34)
L.lnrVA	-0.017***	(-4.25)	-0.016***	(-4.12)
year==2006	0.078***	(17.54)		
year==2007	0.092***	(26.21)	0.014***	(4.64)
year==2008	0.086***	(30.68)	0.010***	(2.65)
year==2010	0.112***	(37.75)	0.040***	(10.33)
year==2011	0.104***	(37.08)	0.032***	(6.59)
lnravgW			-0.250***	(-40.98)
L.lnravgW			0.082***	(10.65)
lnravgLT			-0.006	(-1.60)
L.lnravgLT			0.022***	(5.55)
year==2009			-0.073***	(-16.25)
Constant	1.199***	(10.97)	1.275***	(12.40)
Observations	45568		45465	

t statistics in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

According to the findings from the estimations of dynamic baseline specifications in Table 6.17, the short-run labor cost elasticity of labor demand is -0.26 and the short-run output elasticity of labor demand is about 0.14. Decomposing the labor costs into the wages and labor taxes, we compute the short-run wage elasticity of labor demand as -0.25. But the labor tax elasticity of labor demand is not statistically significant. Therefore, compared to the long-run labor cost and output elasticities of labor demand estimated with static specifications in Table 6.1, the short-run elasticities are smaller. Thus implies those firms' reactions to an exogenous shock in labor costs or in output are smaller in the short-run than in the long-run. This means that firms face adjustment costs in the short-run and this creates persistence in employment. In this respect, our results are in line with the theory and empirical literature.

Table 6.18 presents the estimation results for another dynamic specification formulated to understand the effects of international outsourcing on the labor demand in the short-run. In accordance with its static counterpart, increase in the share of imported intermediate inputs in imports again leads to a decrease in the labor demand. The lagged coefficient for imported intermediate input share also gives a negative and significant result.

Table 6.18 Dynamic Estimation Results for International Outsourcing

	(1) lnPaidL	
L.lnPaidL	0.708***	(25.73)
lnravgLC	-0.263***	(-35.63)
L.lnravgLC	0.115***	(11.77)
lnrVA	0.121***	(31.71)
L.lnrVA	-0.016***	(-3.07)
IntImpShare	-0.033***	(-4.89)
L.IntImpShare	-0.013**	(-2.00)
year==2007	0.024***	(5.95)
year==2008	0.009*	(1.75)
year==2009	-0.081***	(-13.70)
year==2010	0.040***	(7.82)
year==2011	0.026***	(3.99)
Constant	1.237***	(8.33)
Observations	25767	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6.19 is for the dynamic estimation results to investigate the role of foreign ownership on the labor demand. Accordingly, foreign owned firms have also higher incentive to demand labor in the short-run than national firms. However, the estimated lagged coefficient for the foreign ownership dummy does not seem to be statistically significant.

Table 6.19 Dynamic Estimation Results for Foreign Ownership

	(1) lnPaidL	
L.lnPaidL	0.643***	(31.48)
lnravgLC	-0.259***	(-47.33)
L.lnravgLC	0.106***	(14.23)
lnrVA	0.136***	(48.48)
L.lnrVA	-0.017***	(-4.22)
FO	0.039*	(1.79)
L.FO	-0.008	(-0.39)
year==2006	0.078***	(17.54)
year==2007	0.092***	(26.21)
year==2008	0.086***	(30.67)
year==2010	0.112***	(37.78)
year==2011	0.104***	(37.08)
Constant	1.202***	(11.01)
Observations	45568	

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6.6. Calculation of the Half-Life of the Adjustment of Labor Demand

The calculation of the half-life of adjustment (or known as the median adjustment time of employment) is based on the ratio of the log of one half to the log of the estimated lagged employment coefficient (δ) (see Hamermesh, 1993, p. 248). In other words, the median length of the lag, the time it takes the system to move halfway to the eventual equilibria in response to an exogenous shock, is obtained by solving for t^* in $\delta^{t^*} = 0.5$. By formula, it can be formulated explicitly as follows:

[6.12]

$$t^* = \frac{\ln(0.5)}{\ln(\delta)}$$

In the literature, there is a huge range for the parameter values of lagged employment and Hamermesh (1993) also finds great variability for the estimates of the speed of adjustment in his survey with various empirical studies. He argues that high values of median adjustment time are particularly observed in studies which uses annual data and these high values of median adjustment should be considered with caution (Lichter et al., 2012, Hamermesh, 1993).

6.6.1. Estimates for Labor Demand Elasticities and Half-Life of the Adjustment

Table 6.20 summarizes the results of estimations with three different estimators. In addition to estimates from the two-way static fixed effects and Arellano-Bond linear dynamic models we explained through the chapter, the results of pooled OLS are just given to compare the estimates with other two methodologies. The upward bias with pooled OLS is obvious (for details, see Chapter 5). Accordingly, in all estimations for baselines, outsourcing and foreign ownership, the elasticities of labor costs and output attained are higher with pooled OLS. The coefficients from GMM models constitute the background to calculate the long-run elasticities of labor demand. According to the results of fixed effects and GMM estimators, just the significance of labor tax differs between these two estimators for the base estimations. However, the short-run labor demand elasticities are lower than the long-run elasticities of labor demand. As we mentioned earlier, this points considerable adjustment costs for firms in the short-run. For the foreign ownership estimations, with fixed effects model, its own effect increase the labor demand and it also increase the output elasticity of labor demand. However, according to GMM estimates, its own effect is barely significant. The opposite is valid for the international outsourcing estimations. According to the estimates from two-way fixed effects estimator, its own effect is not statistically significant. However, it alters both the labor cost and output elasticities of labor demand. For the GMM estimates, it is also a shifter for labor demand, but in a negative way.

Table 6.20 Comparison of Different Estimators

Dep. Var.: *lnPaidL*	**Pooled OLS (Static)**	**FE (two-way) (Static) (year controls are included)**	**GMM (Dynamic) (year controls are included)**
Base I	***Long-Run***	***Long-Run***	***Short-Run***
lnravgLC	-.4928133***	-.292541***	-.2592198***
lnrVA	.6909572***	.258698***	.1355367***
Base II	***Long-Run***	***Long-Run***	***Short-Run***
lnravgW	-.3723351***	-.259428***	-.2503126***
lnravgLT	-.1205918***	-.0287359***	-.0057765
lnrVA	.689892***	.2583647***	.135103***
Foreign Ownership	***Long-Run***	***Long-Run***	***Short-Run***
lnravgLC	-.4905008***	-.2915806***	-.259348***
lnrVA	.6843697***	.2596343***	.1355508***
i.FO	1.051618***	.9722512***	.0390585*
i.FO#c.lnravgLC	-.2720548***	-.0411053	-
i.FO#c.lnrVA	.1135022***	-.0330158***	-
Outsourcing	***Long-Run***	***Long-Run***	***Short-Run***
lnravgLC	-.4628959***	-.2641992***	-.2634***
lnrVA	.6951889***	.2344365***	.1209546***
IntImpShare	.0846356	.1171013	-.0332149***
c.IntImpShare#c.lnravgLC	-.0750736***	-.036525**	-
c.IntImpShare#c.lnrVA	.042923***	.0158089***	-

Table 6.21 summarizes the estimated labor demand elasticities including the long-run labor cost elasticity and long-run output elasticity calculated from dynamic estimations. Besides, Table 6.21 provides the calculation results of the half-life of the adjustment for labor demand based on dynamic estimations for the short-run. Accordingly, the dynamic labor demand models shows that firms' employment levels are persistent from one year to the next in the Turkish manufacturing sector.

When we consider all these together with the labor cost elasticity of labor demand for the short-run and long-run, we find that firms' reactions to cost shocks are smaller in the short than in the long-run (see Table 6.20). This shows us that firms face adjustment costs and this leads to persistence in labor demand adjustment to some extent. This time span is not so short (see Table 6.21). According our calculations, the half-life of adjustment is about 18 months in the Turkish manufacturing sector. "*This median adjustment time measures the time it takes the system to move halfway to the new labor input equilibrium in response to an exogenous shock"* (Lichter et al., 2012, p.3). These results lead us to infer that employers in Turkish manufacturing sector are implementing different informal strategies to avoid adjustment costs due to institutional obstacles against firing and hiring, because first we don't consider the informal sector in our empirical analyses and second we believe that the labor cost responsiveness of the demand side in the Turkish labor market is higher than our estimates. We hear and/or observe various informal ways to circumvent these costs in our daily lives. So we have anecdotal evidences, but we do not have sound evidences yet.

Table 6.21 Estimated Long-Run Labor Demand Elasticities and Half-Life of the Adjustment

	According to Base Estimation (I) with FE (Static)	**According to Base Estimation (II) with FE (Static)**	**According to Base Estimation (I) with GMM (Dynamic)**	**According to Base Estimation (II) with GMM (Dynamic)**
Long-Run Labor Cost Elasticity	-0.29	-	-0.43	-
Long-Run Output Elasticity	0.26	-	0.33	-
Long-Run Wage Elasticity	-	-0.26	-	-0.47
Long-Run Labor Tax Elasticity	-	-0.03	-	*insignificant*
Long-Run Output Elasticity	-	0.26	-	0.33
Half-Life of the Adjustment	-	-	1.57 (18 months)	1.56 (18 months)

7. CONCLUSIONS

This dissertation study aims to analyze the effects of globalization on labor demand elasticities for the establishments in the Turkish manufacturing sector between 2005 and 2011. Since the outcomes of globalization usually create both winners and losers in the economies, it is important to explore the reflections of increasing economic integration on the Turkish labor market. To that end, three important aspects of globalization, namely international trade, international outsourcing and foreign ownership are discussed and analyzed in the study. We have estimated short- and long-run labor demand models for the Turkish manufacturing sector.

According to our findings from the static estimations of baseline specifications, the long-run labor cost elasticity of labor demand is -0.29 and the long-run output elasticity of labor demand is 0.26. Besides, we decomposed labor costs into wages and non-wage costs, and we calculated the own-wage elasticity of labor demand as -0.26 for the long-run. These results imply that both labor costs and economic growth are important determinants of labor demand. Decreasing labor costs and increasing economic growth lead to employment generation in the long-run.

Our findings for the effects of international trade on labor demand show that increasing volumes of exports, imports and total trade shift the labor demand positively in the long-run. Additionally, increasing shares of exports and imports in value-added and in production value also shifts the labor demand positively in the long-run. Moreover, labor demand incentives of establishments which are dealing with international trade (exports and imports) activities are higher than non-trading establishments in the long-run. However, increasing substitution possibilities for labor input in the long-run reduce the employment motives of firms, even in the domestic markets. This reduction is more pronounced in the establishments engaged in transactions of international trade. Labor cost elasticity of labor demand increase with increasing international trade volume in the long-run. Increase of exports volume does significantly increase the labor cost elasticity of labor demand. Increasing shares of exports and imports in total value added also increase this elasticity. However, at the

extensive margin, the labor cost elasticities of exporting and importing firms is lower than those of non-trading firms.

The effects of imported intermediate inputs (as a proxy of international outsourcing) on the labor demand and labor demand elasticities are also analyzed empirically. Accordingly, the share of imported intermediate inputs in total trade volume and in total production value shifts the labor demand positively in the long-run. Besides, the share of imported intermediate inputs in imports increase the labor cost of labor demand due to substitution effect in the long-run.

Foreign ownership in the manufacturing sector is also analyzed empirically as one of the important aspects for internationalization. Foreign firms are inclined to demand labor more than domestic firms in the long-run. However, their labor cost elasticity of labor demand is higher than national firms.

According to the dynamic estimation results, the short-run labor cost elasticity of labor demand is -0.26 and the short-run output elasticity of labor demand is 0.14. The short-run wage elasticity of labor demand is -0.25 in the Turkish manufacturing sector. These results also imply that both labor costs and economic growth determine the extent of labor demand in a dynamic context. In the short-run, increasing share of imported intermediate inputs in imports shifts the labor demand negatively. But foreign firms are still inclined to demand labor more than national firms in the short-run.

We also calculated the half-life of adjustment for the establishments in the Turkish manufacturing sector. It is about 18 months. Our dynamic panel estimations show that there are considerable adjustment costs against employers and this creates persistence on the adjustment of employment level. The existence of these adjustment costs are also obvious with higher labor demand elasticities in the long-run than in the short-run. Although these estimations and calculations are important to get sound evidences for the demand side of the Turkish labor market, we still need further studies.

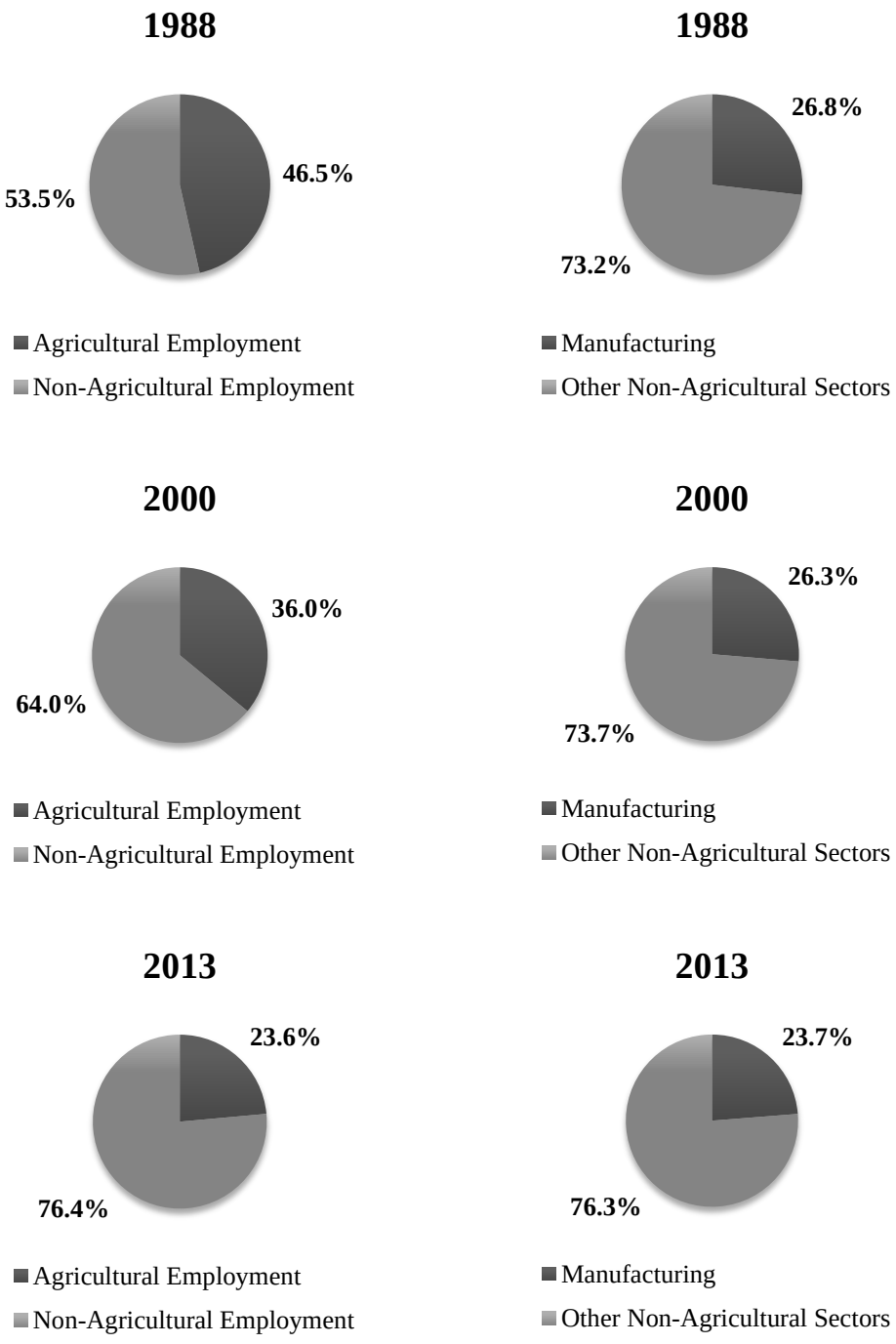
Apart from the importance of estimating labor demand elasticities to determine the extent of firms' responsiveness to the exogenous shocks in terms of employment, the implications of higher (or rising) labor demand elasticities are also so crucial for the

labor. Rodrik (1997) emphasizes three of them. First, higher labor demand elasticities shift the wage and/or employment incidence of non-wage labor costs towards employees from employers. Second, higher elasticities lead to more volatile reactions of wages and/or employment to any exogenous shock to labor demand. Third, higher elasticities shift the bargaining power over rent distribution from labor towards capital, and so it decreases the bargaining power of workers. The empirical research in this dissertation study does not specifically explore whether or not these implications of higher labor demand elasticities come true for the case of Turkey. Nevertheless, our empirical findings for 2005-2011 which suggest that increasing international trade activities in the Turkish manufacturing sector have resulted with higher labor demand elasticities at the establishment level constitute corroborating evidence to the anecdotal evidences for increasing vulnerability of labor against capital in terms of higher wage/employment volatility and eroding bargaining power we observed in the Turkish labor market, particularly since 1980s. Therefore, in addition to the voluminous labor supply studies in the national literature, further empirical studies on the determinants of labor demand and on trends of labor demand elasticities are necessary to understand thoroughly the reflections of globalization on the Turkish labor market.

Since each period in the last three decades after the liberalization act in 1980s have idiosyncratic characteristics in terms of economic and public policies, they deserve to be empirically analyzed and to be compared, particularly regarding their employment generation performance within the context of labor demand theory. Additionally, considering the atypical labor demand adjustments in contraction periods of the economy, the hiring and firing decisions of firms in years of economic crises are again worth to be studied at length. Last but not the least is the consideration for the subsectors of the manufacturing sector regarding their different production technologies and varied degrees of orientation to the international trade activities. Each subsector has a potential of research in terms of labor demand.

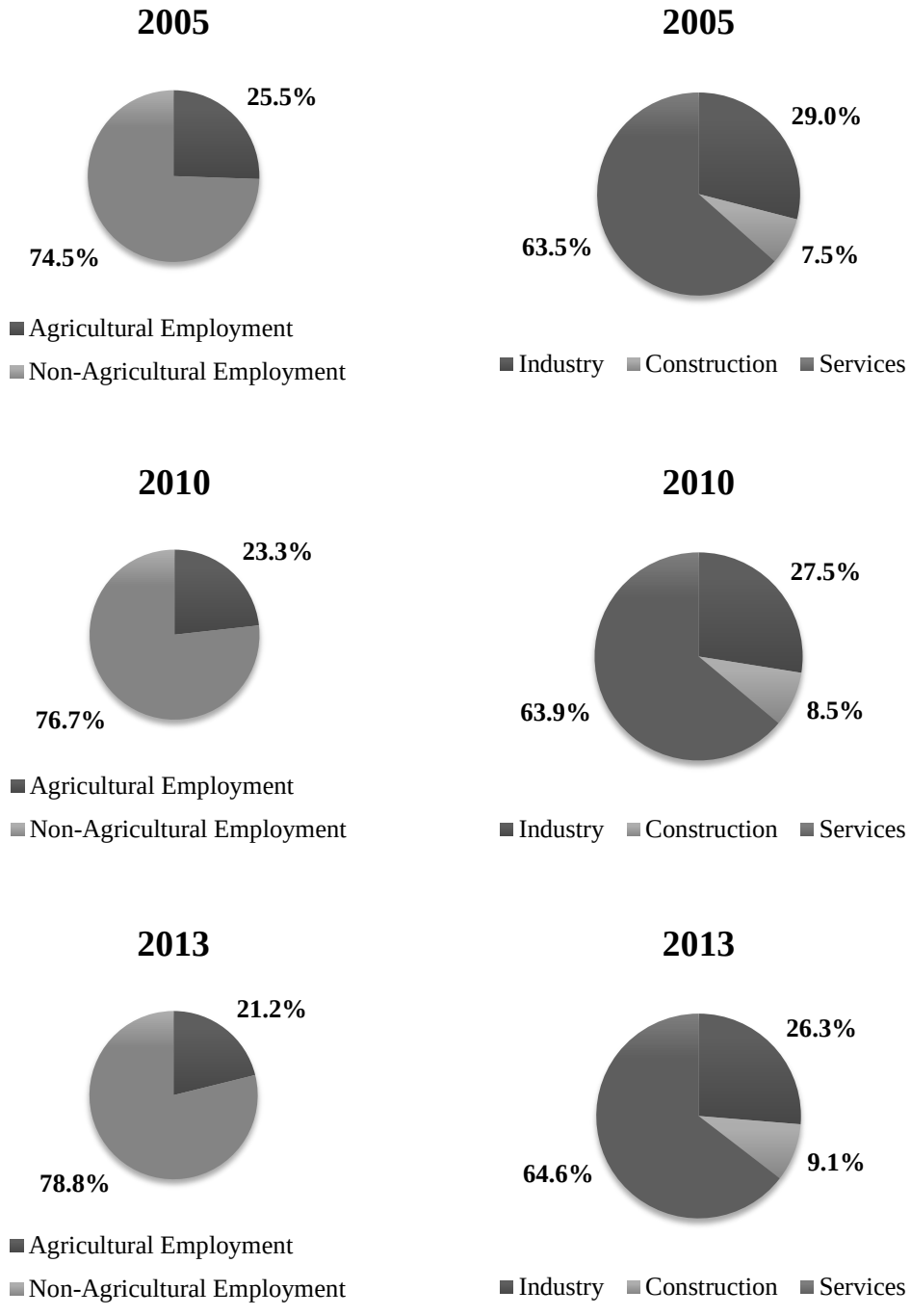
APPENDICES

Figure A.1 Agricultural vs. Non-Agricultural Employment and Share of Manufacturing Employment



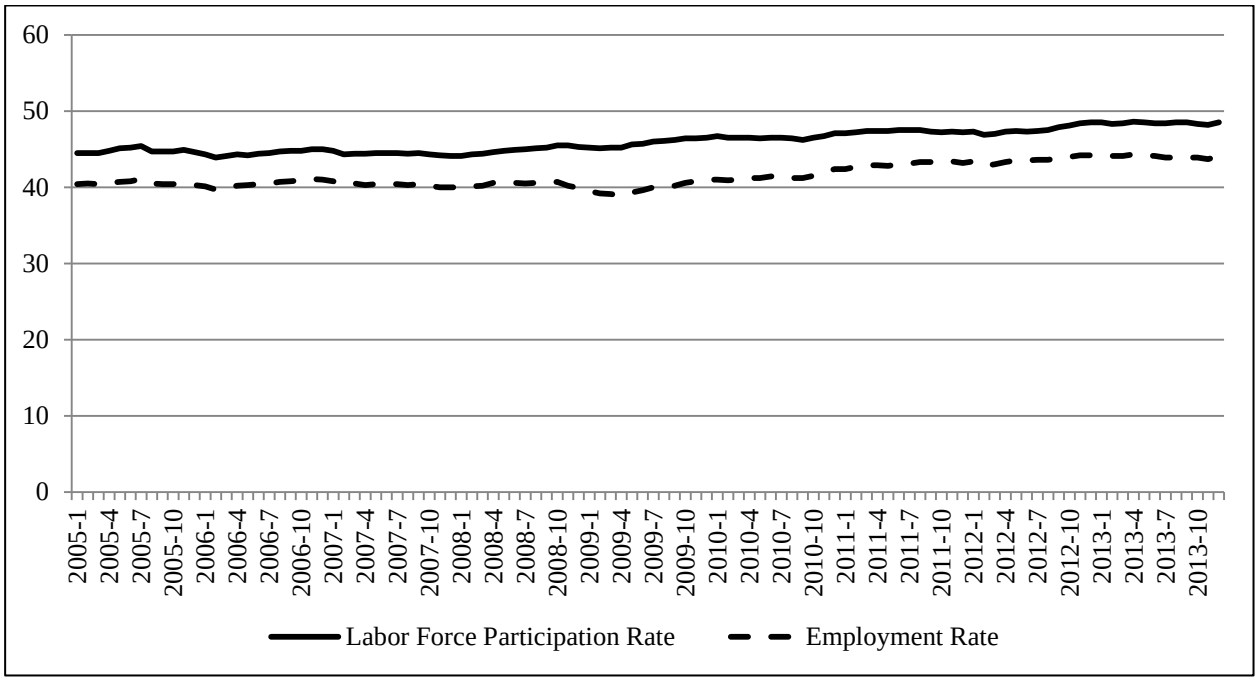
Source: TurkStat (2014a)

Figure A.2 Sectoral Distributions of Total and Non-Agricultural Employment (2005-2010-2013)



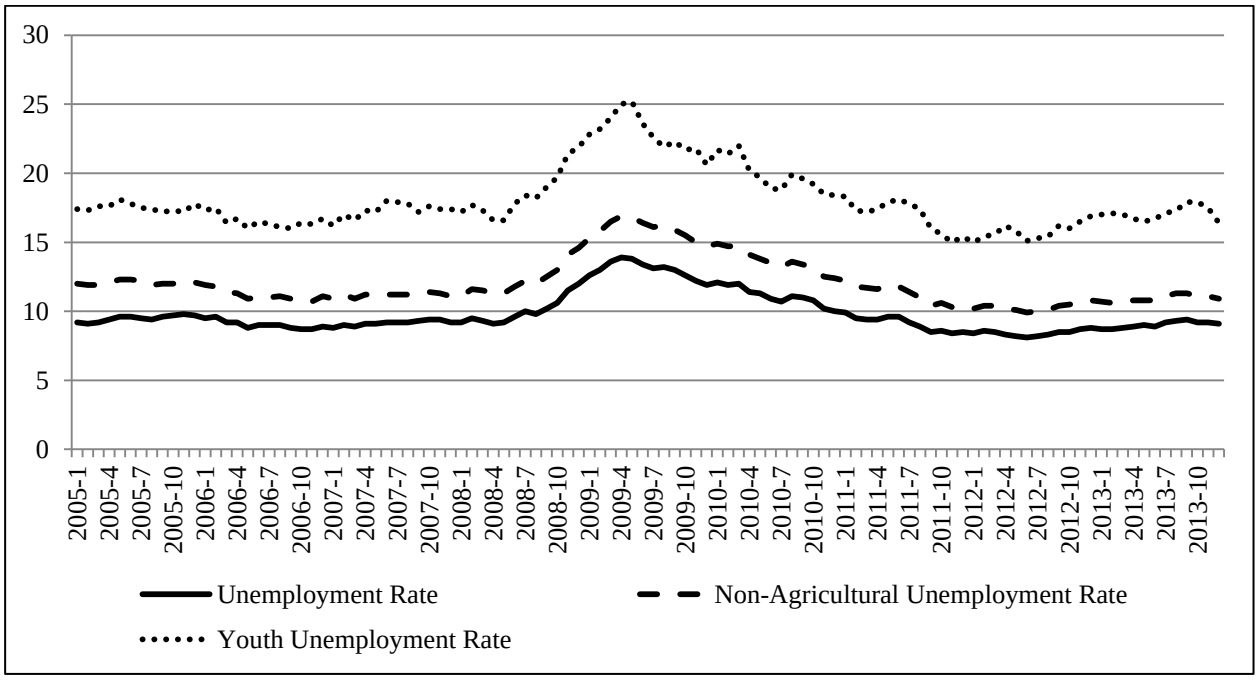
Source: TurkStat (2014a)

Figure A.3 Labor Force Participation and Employment Rates (Seasonally Adjusted) (2005-2013)



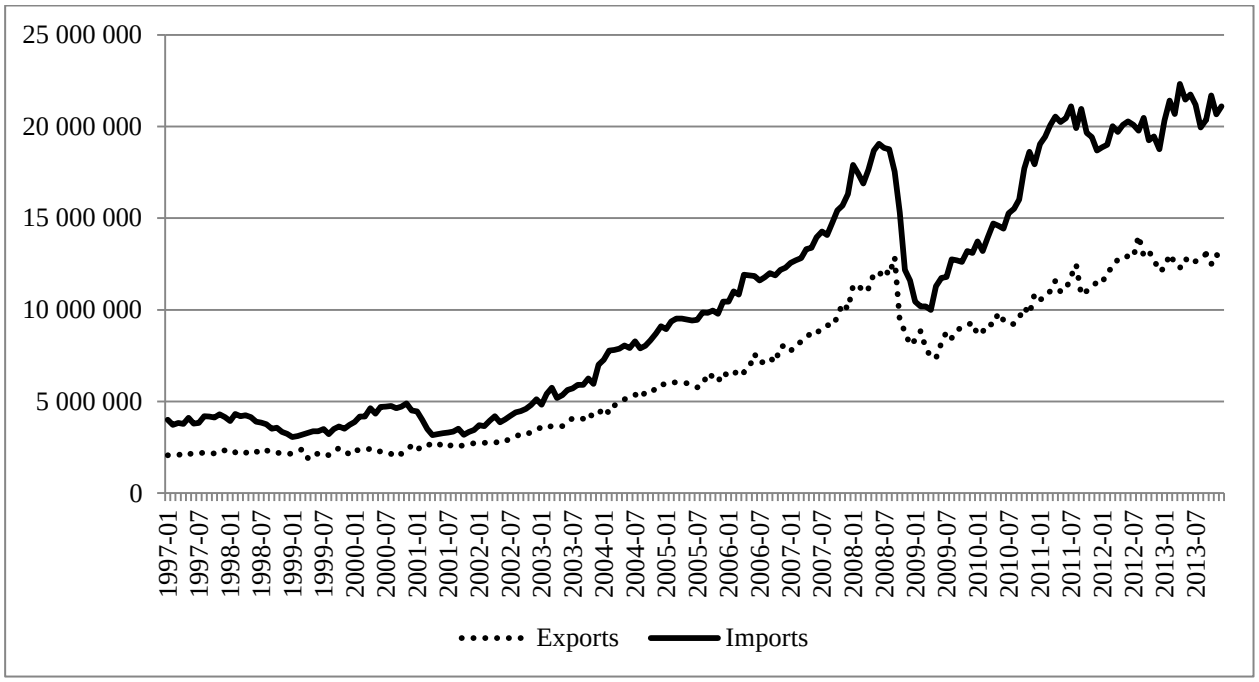
Source: TurkStat (2014a)

Figure A.4 Unemployment Rates (Non-Agricultural and Youth) (Seasonally Adjusted) (2005-2013)



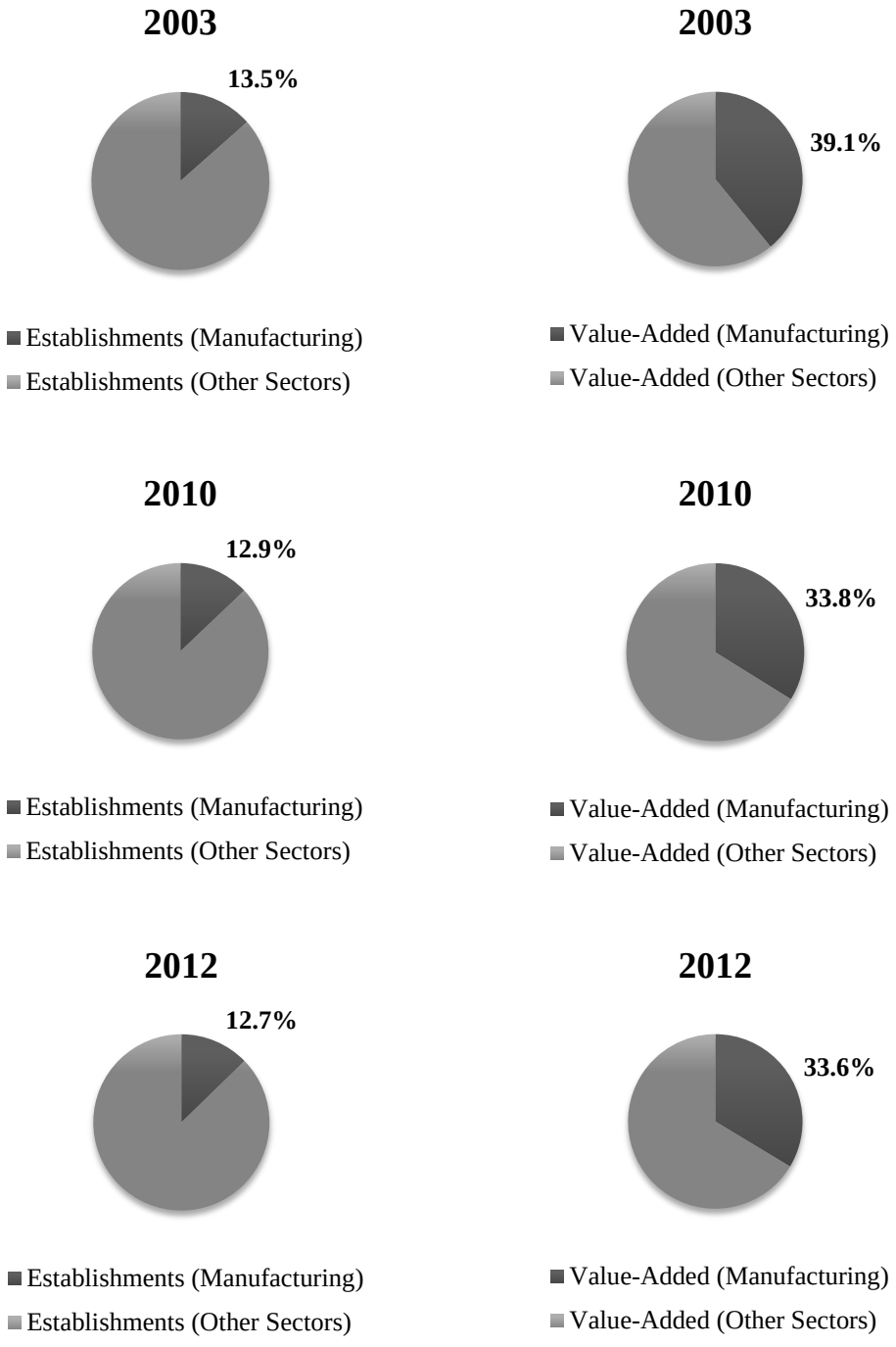
Source: TurkStat (2014a)

Figure A.5 Exports and Imports (Seasonally and Calendar Adjusted) (Thousand $) (1997-2013)



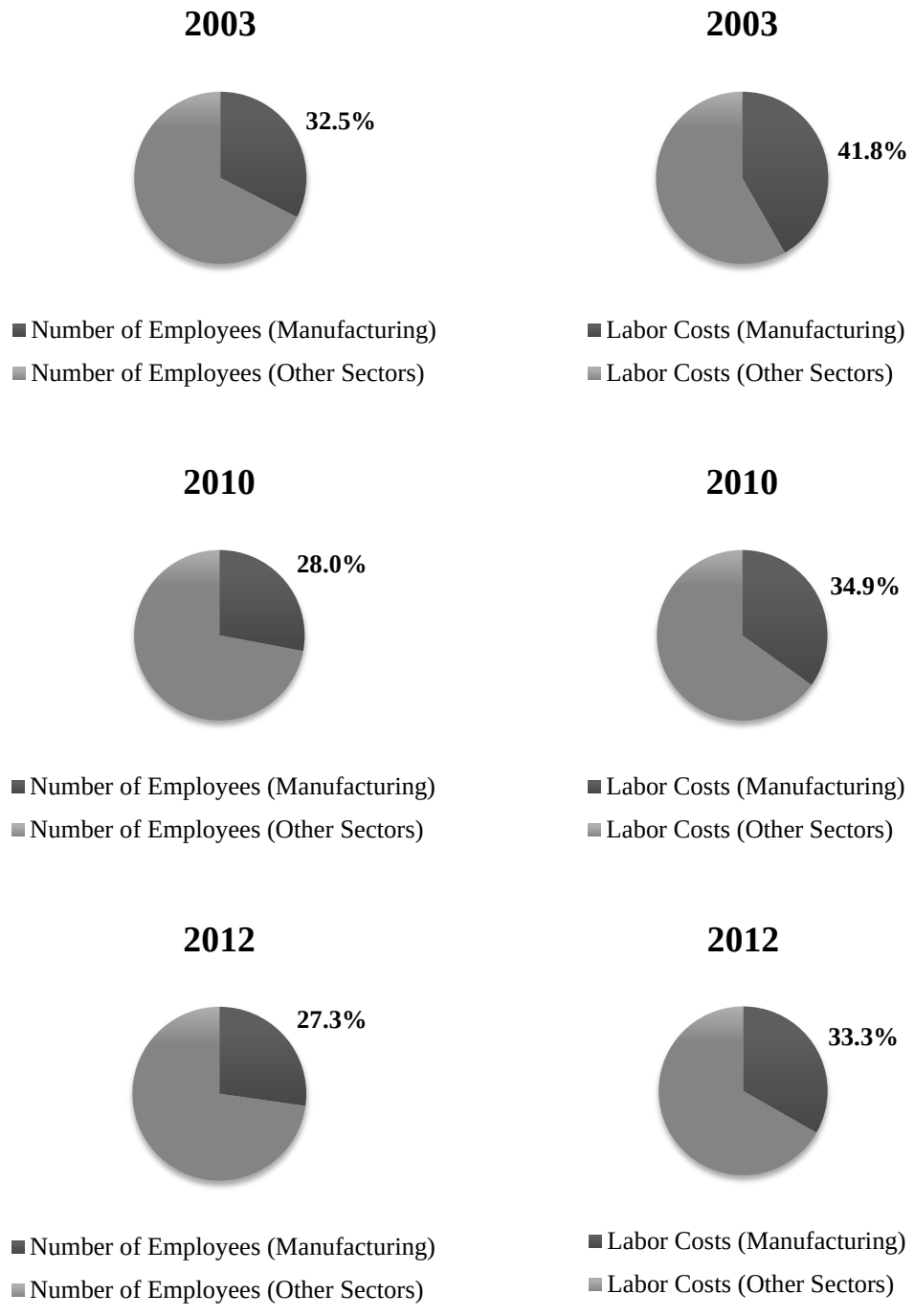
Source: TurkStat (2014b)

Figure A.6 Share of Establishments and Value-Added in Total (Manufacturing vs. Other Sectors) (NACE, Rev.2)



Source: TurkStat (2014c)

Figure A.7 Share of Employees and Labor Costs in Total (Manufacturing vs. Other Sectors) (NACE, Rev.2)



Source: TurkStat (2014c)

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"Does Higher Share in Total Trade Stimulate Regional Labor Market Outcomes? The Case of Turkey" (2011), 30 August-3 September 2011, *51st European Congress of the Regional Science Association (ERSA) 2011 Congress*, Barcelona, Spain (with Research Assistant Zeynep Yılmaz and Assist. Prof. Dr. Gülçin Elif Yücel).

"The Role of Institutions in Regional Economic Growth and Development: The Case of Turkey" (2011), 27-30 June 2011, *IUE-SSEM EuroConference 2011*, Izmir, Turkey.

"Country-Specific Determinants of Turkey's Bilateral Trade with Trade Blocs" (2011), 15-17 June 2011, EconAnadolu 2011, *Anadolu International Conference in Economics*, Eskisehir, Turkey (with Assist. Prof. Dr. Gülçin Elif Yücel).

"The Role of Institutions in Regional Development: Quantity versus Quality" (2011), 01-03 June 2011, *2011 Conference of Eurasia Business and Economics Society (EBES)*, Istanbul, Turkey.

"Regional Trade Performances and Labor Market Outcomes: The Case of Turkey" (2010), 28-30 November 2010, *The 9th International Conference of Japan Economic Policy Association (JEPA)*, Tokyo, Japan (with Research Assistant Zeynep Yılmaz and Assist. Prof. Dr. Gülçin Elif Yücel).

"A Decomposition Analysis of Labor Force Participation Trends of Turkish Young Men and Women School-to-Work Transition" (2010), 28-30 October 2010, *2010 Conference of Eurasia Business and Economics Society (EBES)*, Athens, Greece (with Assist. Prof. Dr. Gülçin Elif Yücel).

"Intra-Industry Trade Expansion and Labor Market Adjustment: The Case of Turkey" (2010), 28-30 October 2010, *2010 Conference of Eurasia Business and Economics Society (EBES)*, Athens, Greece (with Assist. Prof. Dr. Gülçin Elif Yücel).

"Added versus Discouraged Worker Effects and Economic Crises in Turkey" (2010), 01-03 September 2010, *2. International Conference on Economics of Turkish Economic Association (TEA)*, Girne, TRNC (with Assoc. Prof. Dr. İpek İlkkaracan Ajas).

"The Contributions of Higher Education to the Regional Development: The Case of Turkey" (2010), 01-03 September 2010, *2. International Conference on Economics of Turkish Economic Association (TEA)*, Girne, TRNC.

"Transformations in the Structural Determinants of Labor Force Participation in Turkey through the Period of Market Liberalization and Economic Crises" (2010), 24-26 June 2010, *9th International Conference of Middle East Economic Association (MEEA)*, Istanbul, Turkey (with Assoc. Prof. Dr. İpek İlkkaracan Ajas).

"Interactions between BRICs and Turkey: Stock Exchange Markets and Convergence" (2008), 28-30 May 2008, *9th Econometrics and Statistics Symposium in Dokuz Eylül University*, İzmir, Turkey (with Assoc. Prof. Dr. Sadullah Çelik and Dr. Pınar Deniz).

"Interactions between BRICs and Turkey: Stock Exchange Markets and Convergence" (2007), 13-14 April 2007, *3rd International Student Conference of Izmir University of Economics*, Izmir, Turkey (with Mustafa Biçer).

WORKING PAPERS and MIMEOS:

"Economic Crises and the Added Worker Effect in the Turkish Labor Market" (2013), *Levy Economics Institute of Bard College*, Working Paper No. 774, (with Assoc. Prof. Dr. İpek İlkkaracan Ajas).

"The Role of Institutions in Regional Economic Growth and Development" (2011), Marmara University, Department of Economics, *Independent Research Paper No: IRP201101*.[108]

"Macroeconomic Policies and Economic Growth in Turkey" (2010), Marmara University, Department of Economics, *Mimeo*.[109]

"A Time-Series Analysis of Labor Market Migration: The Case of Turkey" (2010), Marmara University, Department of Economics, *Mimeo.*[110]

"Turkish Labor Market in the Post-1980 Period: A Supply-Side Analysis" (2010), Marmara University, Department of Economics, *Independent Research Paper No: IRP201002*.[111]

"The History of Economic Relationships between Turkey, IMF and World Bank" (2010), Marmara University, Department of Economics, *Mimeo*.[112] (in Turkish).

"An Investigation of War Time Economic Policies in Turkey: 1939-1945" (2009), Marmara University, Department of Economics, *Mimeo*.[113] (in Turkish).

"The Lewis Model and The Labor Market in Turkey" (2008), Istanbul Technical University, Economics M.A. Programme, *Mimeo*.[114]

"Economic Freedom and Economic Growth: An Empirical Analysis of Brazil and Mexico Cases" (2007), Marmara University, Department of Economics, *Mimeo*.[115]

"Economic Effects of Terrorism on Growth: Turkey Case" (2007), Marmara University, Department of Economics, *Mimeo*.[116]

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[108] This study was done within the scope of a Ph.D. lecture (ECON 8002 Independent Research Paper II) under the supervision of Prof. Dr. Fatma Doğruel.

[109] This study was done within the scope of a Ph.D. lecture (ECON 8008 Topics in Economic Growth) under the supervision of Prof. Dr. A. Suut Doğruel.

[110] This study was done within the scope of a Ph.D. lecture (ECON 8006 Topics in Econometrics and Statistics) under the supervision of Prof. Dr. Aysu İnsel.

[111] This study was done within the scope of a Ph.D. lecture (ECON 8001 Independent Research Paper I) under the supervision of Prof. Dr. Nesrin Sungur.

[112] This study was done within the scope of a Ph.D. lecture (ECON 8009 Topics in Turkish Economy) under the supervision of Prof. Dr. Nesrin Sungur.

[113] This study was done within the scope of a Ph.D. lecture (ECON 8009 Topics in Turkish Economy) under the supervision of Prof. Dr. Nesrin Sungur.

[114] This study was done within the scope of a M.A. lecture (IKT525E Development Economics) under the supervision of Assoc. Prof. Dr. İpek İlkkaracan Ajas.

[115] This study was done within the scope of an undergraduate lecture (Applied Econometrics) under the supervision of Prof. Dr. Aysu İnsel.

[116] This study was done within the scope of an undergraduate lecture (Applied Econometrics) under the supervision of Prof. Dr. Aysu İnsel.

"Gender Discrimination in the Labor Market and Women's Employment: Turkey Case" (2007), Marmara University, Department of Economics, *Mimeo*.[117]

***SEMINAR PRESENTATIONS*:**

"Household Labor Supply Structure and Family Well-Being: The Case of Turkey" (2014), 17 April 2014, *Kadir Has Üniversitesi, Ekonomi Bölüm Seminerleri.*

"Economic Crises and the Added Worker Effect in the Turkish Labor Market" (2013), 20 December 2013, *Ankara Üniversitesi, Siyasal Bilgiler Fakültesi, Çalışma Ekonomisi ve Endüstri İlişkileri Bölüm Semineri.*

"Economic Crises and the Added Worker Effect in the Turkish Labor Market" (2013), 22 October 2013, *Galatasaray Üniversitesi İktisat Bölüm Seminerleri.*

"The Impact of Household Labor Supply Structure on Poverty and Income Inequality" (2013), 10 May 2013, *İstanbul Teknik Üniversitesi, İşletme Fakültesi, Haydar Kazgan İktisat Seminerleri.*

OTHER ACADEMIC ACTIVITIES:

Assistances for Teaching:

Introduction to Economics, Principles of Macroeconomics, Principles of Microeconomics, Intermediate Microeconomics, Intermediate Macroeconomics, Applied Economics (Graduate), Mathematical Economics

Focus Lectures Taken:

Applied Methods Related to Regime Shifts in Social-Ecological Systems
Short course Istanbul 27-28 June 2014
The Beijer Institute of Ecological Economics
The Royal Swedish Academy of Science

Conference Organizations:

5th World Congress of Environmental and Resource Economists (WCERE)
June 28-July 2, 2014, Istanbul Technical University, Turkey
Member of Local Organizing Team

9th International Conference of Middle East Economic Association (MEEA)
June, 24-26, 2010, Istanbul Technical University, Turkey
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[117] This study was done within the scope of an undergraduate lecture (ECON 406 Seminar in Turkish Economy) under the supervision of Prof. Dr. Erhan Aslanoğlu.

Seminar Organizations:

Haydar Kazgan Economics Seminars (2009-2013)
Istanbul Technical University, Faculty of Management
Member of Organizing Team

Workshop Organizations:

Joint Workshop of Economic and Social Research Center (ESRC) - Istanbul Technical University (ITU) and Global Economic Policy (GEP)-University of Nottingham
October, 1-2, 2009, Istanbul Technical University, Turkey
Member of Organizing Team

Workshop on Income Distribution and Poverty
April, 24, 2009, Istanbul Technical University, Turkey
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