ESSAYS ON INFORMALITY IN THE TURKISH LABOR MARKET

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ABSTRACT

ESSAYS ON INFORMALITY IN THE TURKISH LABOR MARKET

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This thesis investigates the nature, extent and dynamics of informal employment in the Turkish labor market using 2006-2009 Turkish Income and Living Conditions Survey. It is mainly a collection of three essays. In the first essay, an attempt is made to analyze the relevance and implications of three alternative characterizations of informality which include an enterprise-based definition associating informality with small firms, an extended enterprise-based definition incorporating social security protection, and a definition based exclusively on social security coverage. Using probit analysis, we show that social security criterion is the best measure given its ability to capture key relationships between individual characteristics and informality. In the second essay, we compute Markov transition probabilities of individuals moving across six labor market states, then estimate multinomial logit regressions to identify underlying dynamics of variant mobility patterns. Confirming traditional theory which sees formal employment as the ultimate desirable state, we find that formal-salaried individuals are the most reluctant to move and that the probability of transition from informal-salaried state to formal-salaried state is five times that of reverse transition. In the third essay, we examine formal/informal employment earnings differentials. OLS estimation of standard Mincerian equations reveals an

informal penalty, half of which can be explained by observable characteristics. Moreover, applying fixed effects regressions, we show that unobserved individual fixed effects when combined with controls for observable individual and employment characteristics explain the pay differentials entirely.

Keywords: Formal/Informal Employment, Mobility in the Labor Market, Earnings Gap, Panel Data, Turkish Labor Market.

ÖZ

TÜRK İŞGÜCÜ PİYASASINDA KAYITDIŞILIK ÜZERİNE MAKALELER

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Üç ayrı makaleden oluşan bu doktora tezinde, Türk işgücü piyasalarında görülen kayıtdışılığın yapısı ve dinamikleri incelenmektedir. Çalışmada, Türkiye İstatistik Kurumu'nun Gelir ve Yaşam Koşulları Araştırması veri seti kullanılmıştır. Birinci makalede, kayıtdışılık probleminin yansımaları üç farklı tanımdan yola çıkarak incelenmiştir. Bunlardan ilki, kayıtdışılığı küçük ölçekli işyerlerine özgü bir kavram olarak ele alınan işletme temelli tanımdır. İkincisi, işletme temelli tanıma sosyal güvenlik sistemi kapsamında bulunma kriteri getirilerek oluşturulan tanımdır. Üçüncüsü ise, işletme ölçeklerinden bağımsız, sadece sosyal güvenlik sistemi kapsamında bulunma durumuna göre tarif edilen kayıtdışılıktır. Probit modelleme tekniği kullanılarak yaptığımız analizler, bireylerin karakteristik özellikleriyle kayıtdışılık durumlarını ilişkilendirme gücü en yüksek olan tanımın, üçüncüsü olduğunu göstermiştir. İkinci makalede, bireylerin altı farklı işgücü piyasası durumu arasındaki geçişkenlikleri Markov yöntemi kullanılarak hesaplanmıştır. Farklı işgücü piyasası durumları arasındaki geçişlerin belirleyicileri katlı terimli logit yöntemi ile tespit edilmiştir. Kayıtiçi ve ücretli çalışma durumunda olanların farklı bir işgücü piyasası durumuna geçme olasılığının oldukça düşük seviyelerde olduğu gözlemlenmiştir. Kayıtdışı ve ücretli durumundan kayıtiçi ve ücretli duruma geçiş

olasılığının ise tersinden beş kat daha fazla olduğu tespit edilmiştir. Üçüncü makalede ise, kayıtiçi ve kayıtdışı çalışanlar arasındaki ücret farklılıkları incelenmiştir. Standart Mincerian denkleminin en küçük kareler yöntemi kullanılarak tahmin edilmesi sonucunda kayıtdışı çalışmanın ücretlere olumsuz yansıdığı saptanmıştır. Ancak sabit etki regresyon analizleri, gözlenen ve gözlenemeyen bireysel özelliklerin bu ücret farklılıklarının tümünü açıklayabildiğini göstermiştir. Bu sonuçlar sanıldığının aksine, geleneksel segmentasyon teorisinin Türkiye işgücü piyasalarındaki ücret farklılıkları bağlamında geçerli olmayabileceğini ortaya çıkmıştır.

Anahtar Kelimeler: Kayıtiçi/Kayıtdışı İşgücü, İşgücü Piyasasında Geçişkenlikler, Ü ücret farklılıkları, Panel Veri, Türk İşgücü Piyasası

To my dearest wonderful family:

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CHAPTER 1

INTRODUCTION

Labor informality is one of the prominent economic and social phenomena of our era. The extent of its scope and persistence, causes and consequences are drawing extensive interest within global and national development agendas. Yet, the paucity of data and the multifaceted nature of the phenomenon impede robust analyses. Notwithstanding, an improved understanding of the concept and its dimensions is crucial given its severity and pervasiveness. The resultant ample literature on labor informality comprises several attempts to gauge its extent in various countries, to identify its causes and consequences, to establish comparable stylized facts and to devise economic models for policy makers (Batini et al., 2010, p. 4). This thesis aims to complement the existing literature by examining the extent and nature of informal employment in the Turkish labor market. Given its demographic and economic dynamics, Turkey provides rich evidence for a large and heterogeneous informal labor market (Tansel, 1997, 1999, 2001; Bulutay, 2000; Bulutay and Taştı, 2004; Özdemir et al., 2004; SPO, 2009; Kenar, 2009; Reis et al., 2009; Aydın et al., 2010; OECD, 2008; World Bank, 2010; Ercan, 2011). However, existing evidence on labor informality in Turkey is mixed and scant. Data limitations and conceptual obscurity have often hindered generalizable and comparable analyses. Against this background, this thesis attempts to elucidate the informalization in the Turkish labor market in three main ways: definition and measurement, mobility patterns across different labor market states and earnings implications.

The informal sector, when first recognized in the 1970s, was largely assumed to be a residual and temporary phenomenon that would cease to exist once the economy

achieved a sufficient level of modern industrial development and economic growth. However, the evidence thus far has made it clear that this approach was too simplistic and that informality has far-ranging dimensions and refers to many diverse employment relations. Given its widespread and multifaceted prevalence, a better understanding of labor informality becomes exceptionally important in a developing country context for several reasons. First, despite more than four decades of research, still no single, universally accepted view exists to underlie the theoretical, empirical and policy analyses. Indeed, informality is a multifaceted phenomenon which in practice refers to many different types of workers and activities, ranging from informal employees of informal or formal enterprises to unpaid family workers, and from marginal own-account workers to prosperous employers. The ambiguity and plurality of the concept referring to various social and economic phenomena are best described by Perry et al. (2007, p. 21) as:

> *The term informality means different things to different people, but almost always bad things: unprotected workers, excessive regulation, low productivity, unfair competition, evasion of the rule of law, underpayment or nonpayment of taxes, and work underground or in the shadows. The multiplicity of adjectives from very distinct fields of study suggests that we may have a classic blind men and the elephant problem-everybody touches part of the animal but understands only the part they touch.*

Departing from this fact, as Jütting et al. (2007, p. 6) well articulate, an improved understanding of the concept is key to comprehend the distinct facets of informality and their implications.

Secondly, the informal sector plays a central role in developing country economies, accounting for a large share of the output and employment in the context of globalization and its far-reaching influences on national economies. ILO reports that the share of informal employment stands above 40 percent of non-agricultural employment in two-thirds of the emerging and developing countries for which data is available (ILO, 2012). For instance, the share of informal employment in non-agricultural employment is 42.2 percent in Brazil, 49.7 percent in Argentina, 53.7

percent in Mexico, 70.6 percent in Peru, 39.8 percent in Uruguay, 47.5 percent in Venezuela (which have similar GDP per capita rates to that of Turkey), and 51.2 percent in Egypt, 83.5 percent in India, 70 percent in Pakistan (ILO, 2011). Combined with the fact that labor force participation rates in most of these countries are around 50 percent, informality figures become even more revealing. In Turkey, the situation is no less dismal. According to the Turkish Statistical Institute (TurkStat), the share of informal employment in the Turkish labor market stands high at 38.4 percent as of January 2012 (TurkStat, 2012). Moreover, TurkStat reports that the rate of informality is 82.8 percent in agricultural employment and 25.8 percent for non-agricultural employment. Evidently, these figures beg a more nuanced discussion on the nature and underlying dynamics of informal employment.

Thirdly, informal employment has significant costs not only to the individual but also to the economy and society as a whole. For the individuals, the adverse implications of informality are manifold. Most eminently, informal workers are typically subject to higher risks of and unprotected against unemployment, occupational, job security and health related hazards. Given the fact that informality is often associated with low skill and precarious jobs which require protection against various risks such as health, safety and earnings loss, this becomes even more important. Moreover, informal workers are not eligible for the benefits of formal employment such as occupational training, pay rises and well-defined career plans. Furthermore, from the overall economy viewpoint, informal activities work to deteriorate the fiscal balances of an economy by reducing the tax and social security gains that are later used for the public provision of goods and services to the society. This translates into resource losses for the economy and subsequent setbacks in the social protection system. Second, informality causes unfair competition in the economy, since those firms who choose to operate with compliance to the laws and regulations are put in a disadvantaged position. This clearly reduces overall productivity of the economy and harms the sense of equity, employment ethics and rule of law in the society, which will aggravate the situation even worse. Therefore, diagnosing the extent of informal

employment is crucial for identifying the risks and sources of socioeconomic inequality, especially for the vulnerable groups, and for addressing its fiscal, welfare, equity and poverty consequences.

Against this background, the intended contributions of this thesis are mainly threefold. First, this analysis is the first attempt to study different definitions and measures of informal employment in Turkey, using multiple characterizations. Moreover, the analysis is linked to the evolution of the theory of informal and formal labor markets and thereby provides a synthesis of empirical and theoretical literature in the Turkish context. Due to the novel nature of the Income and Living Conditions Survey (SILC) data set, the time span of this study also allows the exploration of the existence and extent of any effect of global economic crisis in the Turkish labor market along the formal/informal divide. In this regard, the ultimate objective is to improve the understanding of the informality concept, thereby stimulating vigorous analyses of labor markets and policy.

Second, in early literature, most analyses hinged on static and aggregate approaches. With the introduction of advanced panel data sets and techniques, more profound and thorough dynamic research was empowered. Labor mobility analysis is one of the most rigorous and informative among these, since it enables dynamic worker flows to be explored across distinct labor market states. To the best of our knowledge and thanks to the panel nature of our data set, this is the first attempt to examine labor mobility in the context of formal/informal divide using Turkish data. More specifically, an extensive mobility analysis is conducted with the aim of examining the nature and extent of worker flows across employment and non-employment labor market states and identifying the effects of certain individual and employment characteristics (i.e. age, gender, education, work experience, economic activity sector, household demographics, etc.) on variant mobility patterns.

Third, this study offers the first analysis of earnings differentials between formal and informal employment in Turkey using panel data and techniques, thereby controlling for not only a rich set of observable characteristics but also individual time-invariant unobserved heterogeneity. In particular, the aim is to test whether there exist earnings penalties for informal workers, which imply the presence of segmentation in the labor market. Moreover, this analysis is the first such to explore earnings differences across the formal/informal as well as the wage/self-employment divide and along different points of the earnings distribution, thereby accounting for the potential structural heterogeneity within sectors.

The data set used in the analyses is drawn from the Income and Living Conditions Survey (SILC), which has been conducted by the Turkish Statistical Institute (TurkStat) since 2006. The novel, nationally representative, rich, panel nature of the survey makes it unique and invaluable for the aim and methodology of the study. It provides detailed information on the employment status, social security coverage, working hours, demographic characteristics, living conditions, job characteristics and socioeconomic conditions, labor and other income of the subjects. Survey results are published annually in both cross-section and panel data set formats. The original cross-sectional samples consist of 30,186 individuals for 2006; 30,263 individuals for 2007; 31,121 individuals for 2008 and 32,539 individuals for 2009. The analysis focuses mainly on the years 2006, 2007, 2008 and 2009, since the micro data set for the following years have not yet been released.

The thesis is comprised of five chapters. Following the introductory chapter, Chapter 2 presents an overview of the economy and the labor markets in Turkey.

In Chapter 3, an attempt is made to analyze the relevance and implications of different definitions and measures of informality in the context of the Turkish labor market. There is no single uniformly accepted definition of informality, but numerous methods in the literature have been tailored specifically to different time and space

contexts. Recognizing the fact that conclusions will be considerably sensitive to the particular definition and measurement used, the objective of this chapter is to propose a comprehensive and holistic conceptual framework that can be used as a well-grounded initial step to a detailed analysis of informal employment and policy in the Turkish labor market. The analysis is particularly linked to the evolution of the theory of informal and formal labor markets in order to provide a synthesis of empirical and theoretical literature in the context of Turkey. The empirical analysis consists of developing three alternative definitions of labor informality, gauging the extent of their association, and exploring the relevance and implications of each for the Turkish labor market using several individual and employment characteristics. The first one is an enterprise-based definition which describes informality with employment in the small firms and self-employment. Then, this definition is modified in a way that those workers who work in the formal sector but have no social security are re-classified as informal, and those who work in the informal sector but have social protection are categorized as formal. The third definition is identified exclusively on social protection coverage. Informality based on these definitions is analyzed and compared in multiple dimensions including age, gender, education, household size, economic sector, geographical region, establishment size and employment status. The first part is descriptive in nature and meant to determine the degree of congruence between alternative definitions and decompose the structure of labor informality in Turkey. In addition, a large time span will be adopted to trace likely transformation dynamics. Next, a multivariate analysis is conducted to explain the likelihood of informality using various personal and job attributes as explanatory variables.

In Chapter 4, we undertake a labor mobility analysis, which became readily available with the introduction of advanced panel data, with a specific emphasis on formal/informal divide. The aim is to provide a comprehensive diagnosis of dynamic worker flows across distinct labor market states and identify the effects of certain individual and employment characteristics on variant mobility patterns. Mobility analysis helps illuminate the abstract informality phenomenon to a significant extent

by providing the means for investigating the implications of and motivations for worker transitions into and out of informal employment, examining the determinants of duration and turnover rates in the informal sector and determining the extent to which and how specific characteristics influence worker flows. More specifically, we first develop and discuss a set of probability statistics based on annual worker transitions across distinct employment states utilizing Markov transition processes. As Bosch and Maloney (2007, p. 3) argue: "labor status mobility can be assumed as a process in which changes in the states occur randomly through time, and probabilities of moves between particular states are governed by Markov transition matrices". Towards this end, we use panel data for 2006, 2007, 2008 and 2009 to compute the transition probabilities of individuals moving across six different labor market states: formal-salaried, informal-salaried, formal self-employed, informal self-employed, unemployed and inactive. We first compute the transition probabilities separately for two, three and four year transitions pertaining to 2006 to 2007, 2006 to 2008 and 2006 to 2009 transitions; for total, male and female samples; and lastly for total and non-agricultural samples. In order to examine the nature of mobility patterns in more detail, we then estimate six multinomial logit models individually for each labor market state adopting a number of individual and job characteristics as explanatory variables. The results reveal various relationships between the covariates and the likelihood of variant transitions, which are of considerable importance for designing policies to effectively address labor informality in Turkey.

Chapter 5 aims to examine the earnings performances of formal and informal workers in Turkey. Informal employment has traditionally been associated with inferior earnings, wage inequality and resulting poverty in the mainstream literature. The conventional segmented markets theory explains this stylized fact by postulating that labor informality is nothing but a survivalist alternative for those disadvantaged or rationed out of formal employment opportunities (Fields, 1975; Mazumdar, 1976; Bernabe, 2002; Perry et al., 2007). Therefore, in a segmented labor market informal workers are typically subject to lower remuneration than similar workers in the

formal sector, where wages are set above market clearing prices for institutional or efficiency-wage reasons (Günther and Launov, 2006, p. 2). Per contra, competitive labor markets theory argues that informal employment may also be voluntarily chosen based on private cost-benefit calculations of individuals and firms. In such a competitive market framework, formal/informal pay inequalities tend to disappear, especially when compensating differentials are accounted for. In contrast to these two polar views, a third view originated by Fields (1990), posits a heterogeneous informal sector consisting of an *upper-tier* of those who are voluntarily informal; and a *lower-tier* of those who cannot afford to be unemployed but have no hope for a formal job. In such a setting, the commonly accepted assumption is that the upper-tier often corresponds to self-employment, whereas the lower-tier segment consists mostly of informal wage workers. Against this background, we aim to contribute to the literature by employing a rich panel data set and recently developed econometric methodologies to explore the following research questions: (1) Is there a formal-informal employment earnings gap in Turkey? (2) Is there an informal sector earnings penalty that indicates the presence of segmentation in the Turkish labor market? (3) How does the earnings distribution across formal/informal sectors alter when employment is further broken down into wage/self-employment; i.e. formal wage workers, formal self-employed, informal wage workers, informal self-employed? (4) What are the main individual and employment type characteristics driving the formal-informal employment earnings gap? (5) To what extent can earnings differentials be explained by such observable factors and unobserved time-invariant heterogeneity? The empirical analysis consists of examining the earnings differential along multiple dimensions, disentangling at the formal/informal employment, wage/self-employment divides and mean/quantiles of the earnings distribution. For this purpose, we first estimate standard Mincer earning regressions at the mean using ordinary least squares controlling for a rich set of observable individual and employment characteristics. However, as pointed out in several earlier studies, one must account for unobserved factors that are associated with the level of earnings and intrinsic heterogeneity within formal and informal sectors. To address the first one, the panel nature of the data

enables us to apply fixed effects estimation, thereby accounting for the time-invariant unobservables which constitute important determinants of the pay differentials. For the latter, we rely on quantile regression estimation, which allows for a distributional analysis of the pay gap at various points of the earnings distribution, thereby acknowledging potential structural heterogeneity within sectors.

Finally, Chapter 6 provides a summary of the main findings and implications for policy.

CHAPTER 2

AN OVERVIEW OF THE TURKISH ECONOMY AND LABOR MARKET

2.1. An Overview of the Turkish Economy in 1980-2011

Turkish economy has been experiencing a deep structural transformation for the last three decades. 24 January 1980 decisions, which can be considered as the triggering factor of economic transformation, increased Turkey's global integration. 24 January 1980 decisions included policy reforms such as liberalization of foreign direct investment and import regimes, privatization of state owned enterprises, and gradual abandonment of government subsidies mainly in agriculture. After these became in force, Turkey's import substitution strategy since the 1960s was replaced with private sector centered export-led growth strategy. Also in this period, a significant amount of resources was spent on improving country's physical infrastructure, which made Turkey's energy, transport and telecommunications infrastructure more conducive for private sector activity. 1980s were completed with capital account liberalization rendering the country open to foreign savings, which was essential to sustain high growth rates in the economy. All these liberalization efforts triggered the structural transformation process that is still in progress in the Turkish economy.

The paradigm shift in Turkey's development strategy translated into better economic outcomes through several means. Average annual GDP growth rate increased from 4 percent in 1970-1980 to 5.3 percent in 1981-1990. GDP per capita increased from 2500 USD in 1980 to 3500 USD in 1990.[1] Liberalization efforts proved to be effective and Turkey's economic ties with the rest of the world became stronger in

[1] Measured in constant USD with 2000 prices

this period. Trade volume as percentage of GDP, which is a commonly used measure for openness of countries, increased from 17 percent in 1980 to 31 percent in 1990. The amount of Turkish exports was only 3.6 billion USD in 1980, whereas it reached to 21 billion USD in 1990. Turkish exports not only increased in magnitude but also became more sophisticated during the 1980s. The share of manufactured goods in total exports rose from 26 percent in 1980 to 68 percent in 1990. Pthe 1980s policy reforms affected the internal migration trends as well. Share of population living in urban areas was 44 percent in 1980 and became 60 percent in 1990. Labor flows from agriculture to manufacturing and services caused an increase in the overall productivity in the Turkish economy fuelling rapid economic growth.

Even though the short term economic outcomes of the liberalization efforts in 1980s were positive, Turkey's unsatisfactory economic performance throughout the 1990s is mostly due to the unfavorable aspects of the policy framework that was put in place during 1980s. Öniş (2004) states that the market-friendly reforms of 1980s were put in place very quickly and without any hindrance from the potential losers, since democratic processes such as bureaucratic and parliamentary norms were by-passed by the then government through excessive use of decrees and extra budgetary funds. Being an open economy with a weak institutional infrastructure and substantial governance problems rendered Turkish economy vulnerable to negative external shocks to a great extent. In 1994, the economy experienced a severe balance of payments crisis that caused a 4.7 percent contraction. Moreover, on the contrary to 1980s, competition in the political sphere intensified during 1990s and coalition governments started to rule the country. Coalition governments that are formed by political parties from different sides of the political spectrum undermined the political stability in the country.

Turkey's economic performance throughout the 1990s was significantly worse than it was during the 1980s. Average annual GDP growth rate declined to 3.7 percent in 1991-2000 period from 5.3 percent in 1981-1990 period. Average inflation in the

Turkish economy soared from 52 percent in 1981-1990 period to 77 percent in 1991-2000 period. Despite the lackluster economic growth and higher inflation, structural transformation was in progress in the Turkish economy during 1990s. The Customs Union Agreement signed with the European Union constituted a critical milestone in Turkey's expanding global economic relations. Openness of the Turkish economy reached to 43 percent in 2000 from 31 percent in 1990. The share of manufacturing exports in total exports rose significantly to 82 percent in 2000 from 68 percent in 1990. Moreover, urban population as a share of total population increased from 59 percent in 1990 to 65 percent in 2000. However, due to the weak institutional infrastructure, misconducts in monetary and fiscal policies, and political instability stemming from coalition governments, Turkey found itself mired in the most devastating economic crisis of its history in 2001.

Turkey entered the 21st century with fundamental macroeconomic challenges that were fixed to some extent by the implementation of the structural adjustment program backed by the International Monetary Fund (IMF). The economy was suffering from unsustainable budget and current account deficits, excessive reliance on short term foreign portfolio inflows, high inflation and interest rates in the beginning of 2000s. A verbal clash between the prime minister and the president during the National Security Council meeting triggered a balance of payments crisis that was followed by a 5.7 percent contraction of GDP in 2001. Followingly, public debt burden, inflation, and interest rates climbed up to extraordinarily high levels and Turkish Lira was devaluated. After the crisis a structural adjustment program was put into action in order to address the country's macroeconomic problems. As part of the program, the government abandoned agricultural subsidies, gave independence to the central bank, restructured the inefficient banking system, ensured the fiscal discipline, established the regulatory institutions, and accelerated the privatizations of several state-owned enterprises.

The reward for having stronger macroeconomic fundamentals came with higher growth rates and deeper economic integration. The average annual growth rate of the Turkish economy between 2002 and 2007 reached 6.8 percent, which is above that of the averages of the previous two decades. High growth rates could be sustained since there was only little or no inflationary pressure. Indeed, consumer price inflation decreased remarkably from 54 percent in 2001 to 9 percent in 2007. This was mainly due to the strong monetary and fiscal policy stance of the central bank and the government. Turkey's goods and services exports soared to 144 billion USD in 2007 up from 54 billion USD in 2002. Another indication of the increased economic integration was the record high levels of foreign direct investment (FDI) inflows. The total amount of FDI reached to 52 billion USD between 2002 and 2007 from only 11 billion USD between 1974 and 2001.

Despite all these achievements after the 2001 crisis, Turkish economy became more dependent on foreign funds due to its high current account deficit. Letting Turkish lira to appreciate and keeping interest rates at high levels rendered Turkey an advantageous destination for foreign savings that the country was in need of to sustain its economic growth. The current account deficit which averaged around 0.8 percent of GDP between 1990 and 2001, became 3.8 percent between 2002 and 2007. Despite record high levels of the current account, sustainability was not a serious problem thanks to the favorable global financial conditions and strong policy stance of the government in favor of fiscal discipline domestically. However, as noted by Rodrik (2009), it is in fact the developments in the external financial markets that really matter for the sustainability of the foreign funds flows. Turkey experienced the validity of this statement in the wake of the 2008 global financial crisis.

The Turkish economy was hit very hard by the 2008 global financial crisis. The most important impact came through as a dramatic decline in foreign fund inflows making the sustainability of the current account deficit questionable. Secondly, the economic slowdown in Turkey's major export destinations created a significant drop in the

demand for Turkish exports. Lastly, all these unfavorable developments affected consumer sentiments negatively, thereby resulted in a sharp decline in domestic consumption.[2] The combined impact of these three channels was a 4.8 percent contraction in 2009. Turkey was among the top 10 economies that were affected the most severely by the global financial crisis in 2009.

Thanks to strong macroeconomic fundamentals, the Turkish economy recovered from the global financial crisis quite rapidly. The recovery was mainly due to resumption of the foreign fund inflows. Low interest rate policies and subsequent increases in the money supplies of the advanced economies made these countries less attractive in the eyes of global fund managers. Turkey as a country with strong macro fundamentals and relatively higher interest rates started to become more appealing as an investment destination. Subsequently, the amount of foreign savings coming to Turkey increased substantially and fuelled the rise in domestic credits and consumption expenditures. GDP growth rates in 2010 and 2011 were 9 percent and 8.5 percent, respectively. However, sustainability of the growth process is still highly questionable since the current account deficit reached record high levels of around 10 percent of GDP. Moreover, the quality of financing of the deficit has worsened. The importance of portfolio investments is increasing vis-à-vis longer term investments such as foreign direct investments. Along these lines, it can be stated that the Turkish economy is vulnerable to negative external shocks more than ever in its history.

This brief account of last three decades shows that the Turkish economy transformed itself from a closed agrarian economy to an open industrial economy. Turkey paid the cost of being an open economy with institutional deficiencies which caused periodic balance of payments crises. Despite all these economic downturns, Turkish economy is in a healthier situation relative to the previous decades. However, it should also be noted that the economy is still quite vulnerable due to the high levels of its current

[2] For a comprehensive analysis of the impact of global crisis on Turkey, see TEPAV (2009), available at: http://www.tepav.org.tr/eng/admin/dosyabul/upload/TEPAV_kriz_raporu_en_pn.pdf.

account deficit. After summarizing the main characteristics of the Turkish economy and major structural breaks in the last three decades, we now turn our attention to the labor market dynamics. In the following section, an overview of the structure of the Turkish labor market is presented.

2.2. An Overview of the Turkish Labor Market: Structure and Challenges

Labor market trends in the Turkish economy have changed dramatically over the last three decades. This significant change has been taking place mainly due to three factors: demographic dynamics, structural transformation of the economy, and the changing economic policy and regulatory environment. Significant expansion of the workforce made the link between economic growth and employment generation more important than ever. Shifting from agriculture to manufacturing, rapid urbanization and integration with the global economy increased the need for more skilled workers. Against this background, we provide a brief discussion of the Turkish labor market, with reference to the main driving forces.

2.2.1. Demographic Trends

Turkey has been undergoing a dramatic demographic transition since the last couple of decades. The number of new births per 1000 population was approximately 17 and the number of deaths around 5.5 in 2010. Given the birth rates well above the death rates, Turkey's population increased from 44 million in 1980 to 73 million 2011, and is expected to reach its maximum between 2050-2055. As illustrated in Figure 2.1, United Nation's projections show that birth and death rates of Turkey will then be equalized. Afterwards the death rate is expected to outpace the birth rate, and the population is expected to decline gradually.

Turkey's demographic dynamics provided the country with a demographic burden in the beginning but a gift afterwards. At the outset of Turkey's demographic transition,

dependency ratio, that is the ratio of the population aged 0-14 to the population aged 15-64, peaked at 0.7 in the 1960s and is expected to fall progressively to below 0.3 over the next 50 years (World Bank, 2006, p. 3). Given the rising share of working age population in total population and declining birth rate, the dependency ratio is on a declining path.

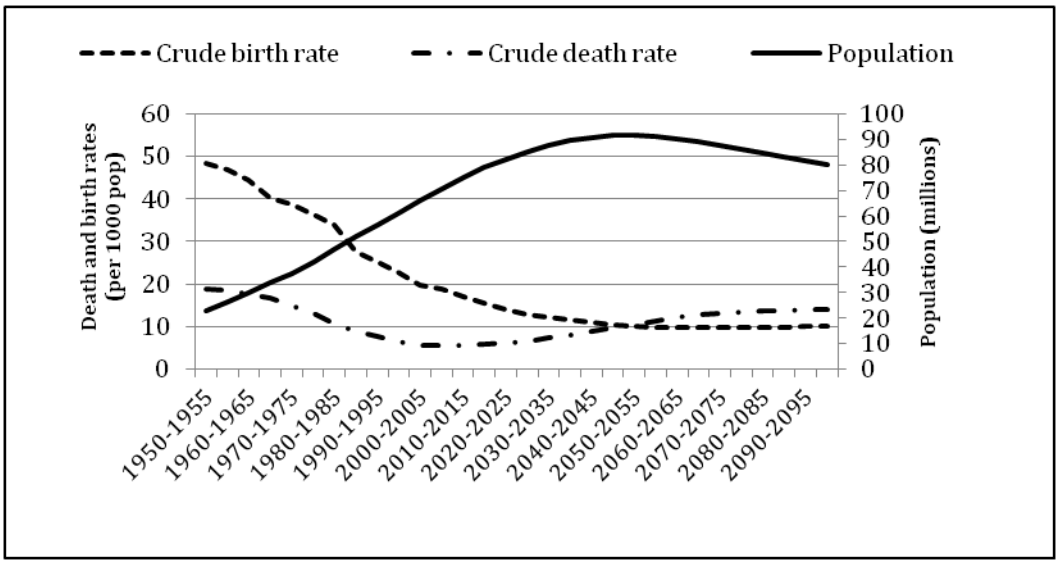

Figure 2.1: Death rates, birth rates and total population (1950-2095)

Source: UN Population Statistics.

Turkey incurred a significant cost in the beginning of its demographic transition but in the later stages due to the falling dependency ratio, demographic trends turned out to be favorable for economic growth. It is stated in World Bank (2006) that working age population growth has a positive impact on economic growth whereas the growth of total population has an adverse effect. The negative effects of the demographic trends until 1979 has reversed due to the rapid increase in working age population that is estimated to contribute around 2 percentage points to the economic growth in Turkey. However, the positive contribution of demographic dividend is expected to weaken when the dependency ratio starts back to increase after 2050. This expected

increase in Turkey's dependency ratio will be mostly due to the increasing share of elderly people in total population, as illustrated in Figure 2.2.

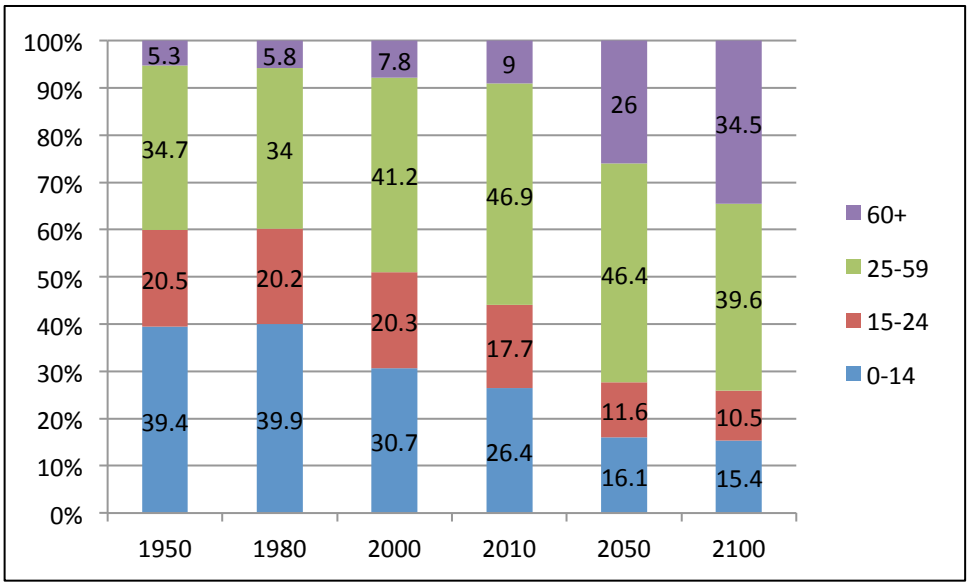

Figure 2.2: Turkey's population by age groups (1950-2100, %)

Source: UN Population Statistics.

Can Turkey fully benefit from its demographic dividend? To answer this question one needs to analyze the labor market outcomes in Turkey. The next section discusses the structural transformation and productivity in the Turkish labor market.

2.2.2. Structural Transformation and Productivity

Structure of employment in Turkey has changed remarkably after the 1980s. Rapid urbanization and reallocation of labor from lower to higher productivity activities constituted the main driving forces of changing sectoral employment trends. Figure 2.3 shows the urbanization trends in Turkey. Turkey's urbanization rate, measured as the share of population living in urban areas in total population, was the lowest among Spain, Greece and Portugal back in 1960. However, in 2010 urbanization rate in Turkey increased and passed that of Greece and Portugal. Urbanization in Turkey

gained momentum after 1980s mainly due to abolishment of the agricultural subsidies that caused people to migrate from rural to urban areas.

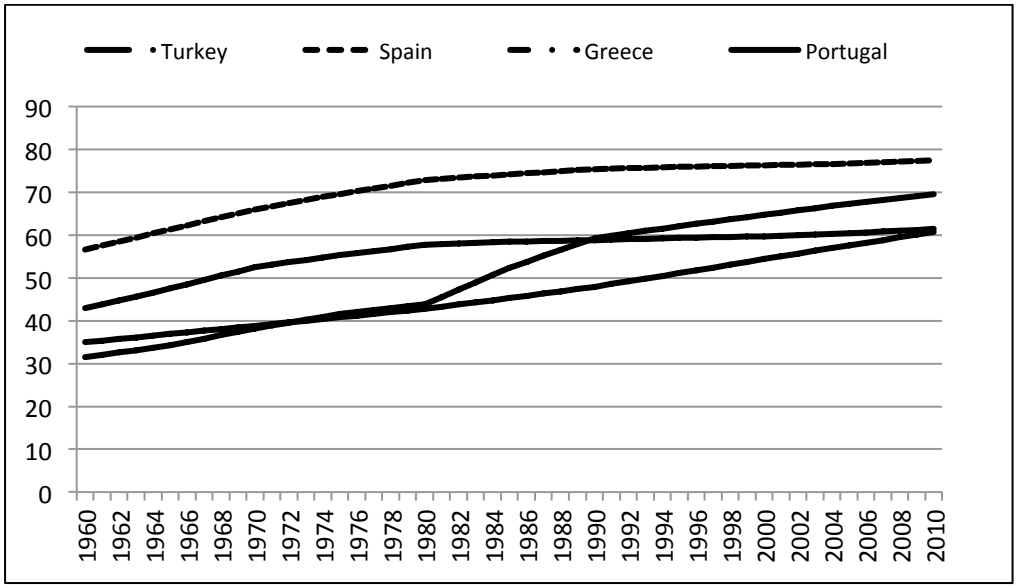

Figure 2.3: Urbanization trends in selected countries (%)

Source: World Development Indicators.

Rapid urbanization translated into a substantial change in sectoral employment trends. Figure 2.4 shows that from 1980 onwards, share of agricultural employment in total employment has fallen significantly, and the weight of industry and services have increased sharply.

Reallocation of labor from low to higher productivity activities has been the main source of overall productivity increases. Production per employee is approximately five and four times higher in services and industry, respectively, than it is in agriculture. Along these lines, it can also be claimed that the main driving force of productivity increases in Turkey has been internal migration for the last three decades. Since the urbanization and labor flows from agriculture to manufacturing and services will not be as rapid as it was before, productivity increases sourced from these forces will be limited. Therefore, there is a need for increasing productivity within sectors.

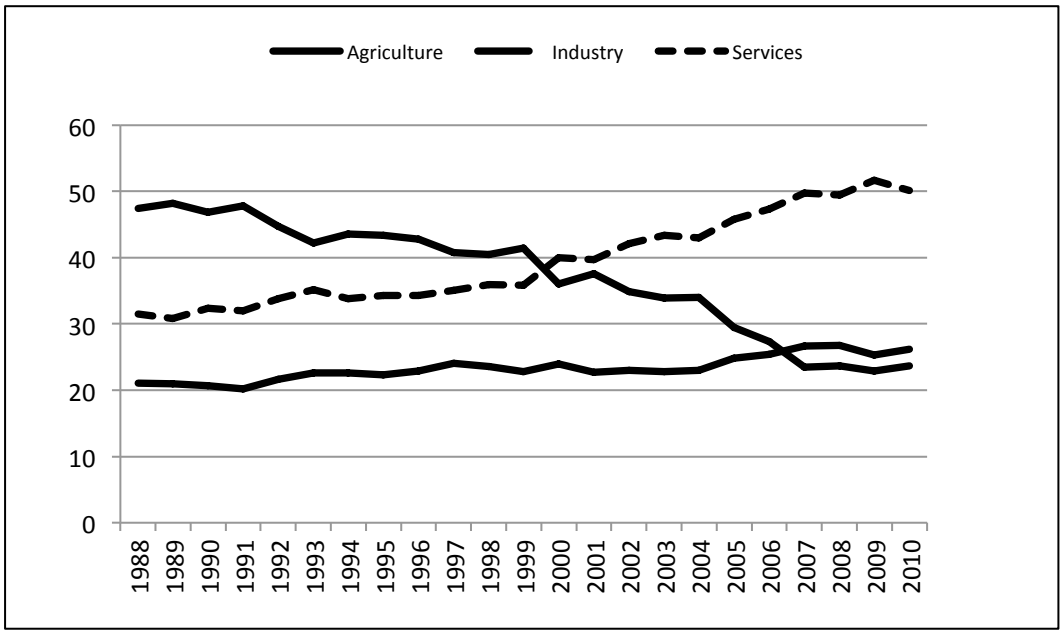

Figure 2.4: Sectoral employment shares in the Turkish economy (%)

Source: World Development Indicators.

Productivity increases are critical for Turkey to reach its 2023 target of becoming one of the top ten largest economies in the world. In order to attain the target level of income, output per worker in the Turkish economy should reach to similar levels that of advanced countries on the list. However, advanced countries among the top ten largest economies in the world such as United Kingdom, Italy and Germany have output per worker levels three times as large as Turkey. World Bank (2007) shows that almost 75 percent of the difference between GDP per capita levels of Turkey and the EU-27 countries is due to the difference in output per worker levels. Other factors that leave Turkey behind EU-27 in income per capita level are low levels of labor force participation and employment rates. These factors account for 15 percent and 10 percent of the difference, respectively. Along these lines, we can conveniently claim that urbanization and the structural transformation trends have significant impacts on labor market outcomes. Next, we move to labor force participation and employment trends in the Turkish economy.

2.2.3. LFPR and Employment Rate in Turkey

One of the most fundamental challenges that Turkey faces in terms of labor market outcomes is its low labor force participation rate (LFPR), measured as the percentage of economically active people in total working age population. Turkey's LFPR is remarkably low relative to international standards, and one of the lowest among OECD members. In 2010, average LFPR of OECD members was 60 percent which is more than 10 percentage points above that of Turkey's (Figure 2.5). The only country that falls behind Turkey is Italy with 48 percent LFPR in 2010.

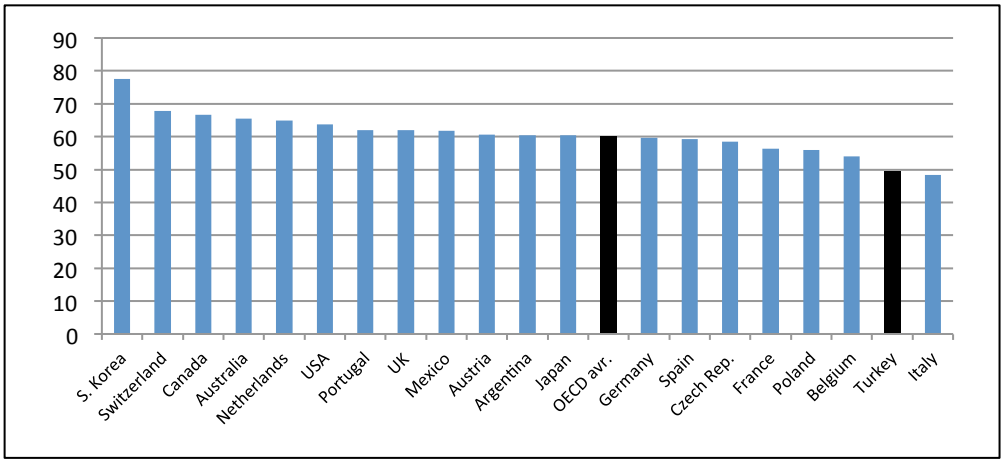

Figure 2.5: LFPR for selected OECD members (%)

Source: World Development Indicators.

Moreover, Turkey's LFPR has been following a falling trend for the last two decades, from 58 percent in 1990 to 49.5 percent in 2010 (Figure 2.6). Development experience of several countries show that LFPR follows a U-shaped path meaning it decreases in the early stages of development but rises as countries reach higher per capita income levels. The U-shaped structure can be associated with the rapid urbanization process in Turkey that was mentioned before. Urbanization, cultural factors, and labor regulations have been the main culprit in the already low and declining levels. However, in order to identify the underlying reasons of Turkey's

exceptionally low levels of LFPR, one needs to analyze LFPR dynamics at a more disaggregated level.

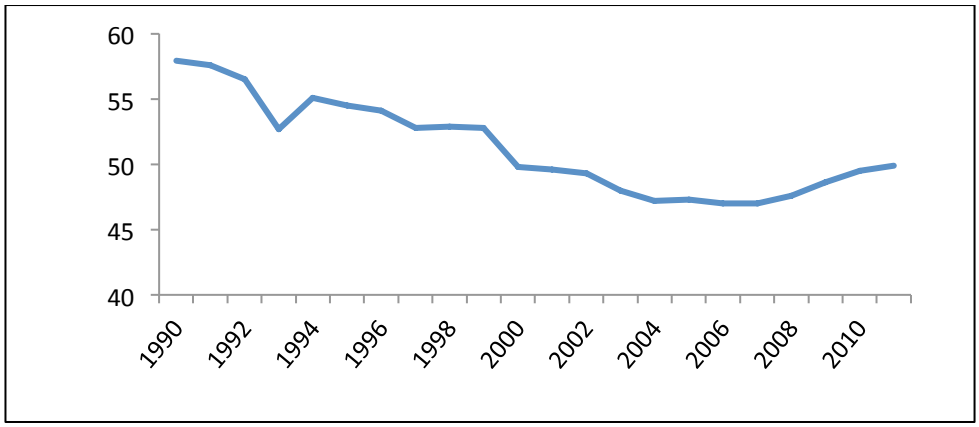

Figure 2.6: LFPR in Turkey (%)

Source: World Development Indicators and TURKSTAT.

There is a significant gender gap in the Turkey's LFPR. Women's participation in the economic life is remarkably limited in all standards. As illustrated in Figure 2.7, female LFPR declined from 35 percent in 1990 to 28 percent in 2010.

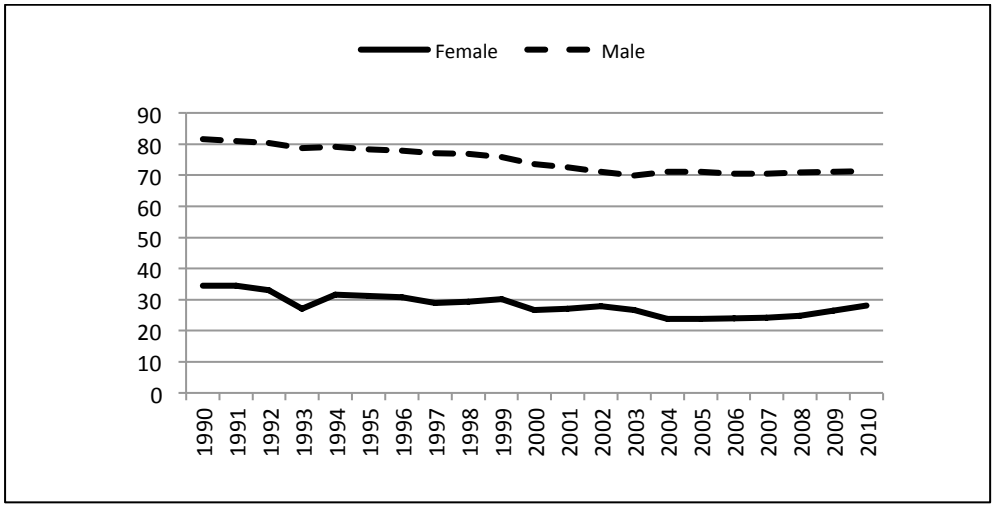

Figure 2.7: LFPR in Turkey, (by gender, %)

Source: World Development Indicators.

In 2010, Turkey had the lowest female LFPR among all OECD countries. Not only female but also male LFPR has declined over the last two decades, from 82 percent in 1990 to 71 percent in 2010. Despite the fall in male LFPR over the last two decades, it is currently slightly higher than the OECD average that is around 69 percent. In light of these findings, it is possible to say that general downward trend in Turkey's LFPR is due to falling male and female LFPR. Nevertheless, Turkey's unfavorable LFPR position among OECD countries is mainly to low levels of female LFPR.

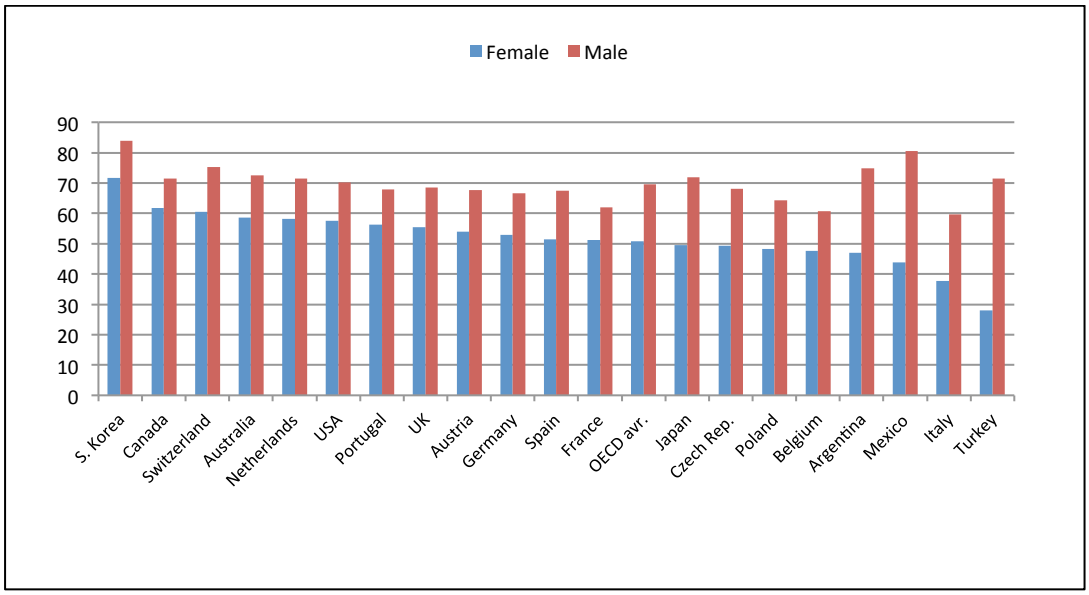

Figure 2.8: LFPR in selected OECD members (by gender, %)

Source: World Development Indicators.

LFPR in Turkey shows significant variation in terms of gender and location of the individuals. Figure 2.9 illustrates gender and location based LFPRs between 1988 and 2011. In all gender-location categories, except the Female-Urban, Turkey has shown a remarkable decline in the period under question. The most significant reduction occurred in Female-Rural category. This observation is particularly interesting since the jobs available in the rural areas are mostly in agriculture and suitable for women having low educational attainments. Another important finding is that the LFPR of females living in urban areas are increasing, which indicates that the females coming

from rural to urban areas are indeed integrating themselves to the city life. Increasing educational attainment levels and changing cultural norms can be listed as the main reasons for the rising LFPR of females living in urban areas. On the other hand, LFPR of males in both rural and urban areas have been following a declining path. The rise in the number of years of schooling and duration of military service may be drivers of this trend.

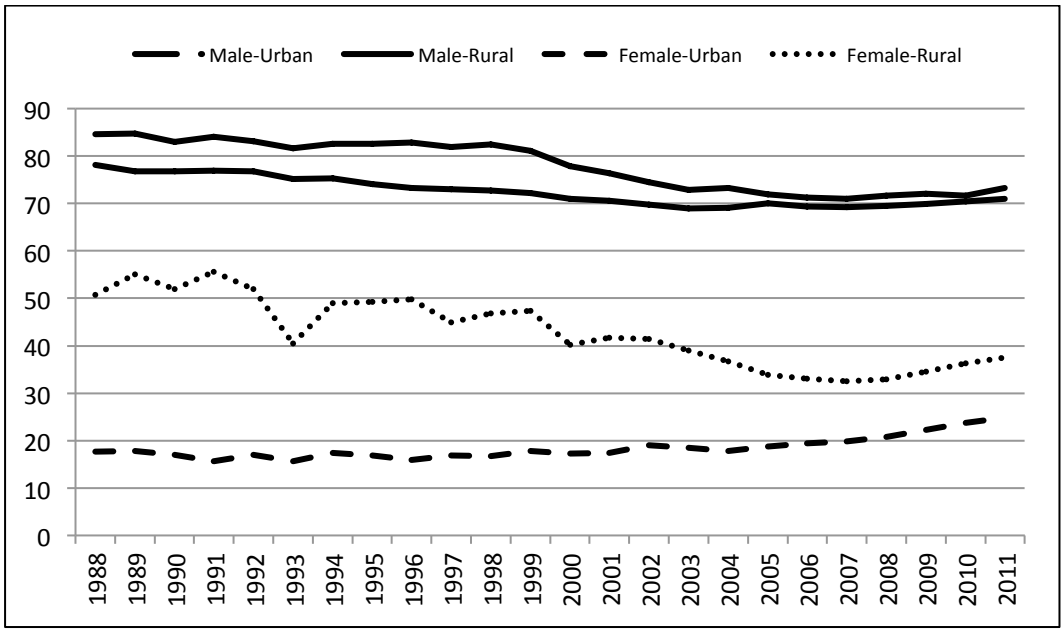

Figure 2.9: LFPR by gender and location categories (%)

Source: Household Labor Force Survey of TURKSTAT.

LFPR in Turkey varies to a great extent with educational attainment (Figure 2.10). For men, the lowest LFPR is among the illiterate people. Those who are literate with no education and those with primary education diploma have slightly higher LFPR than the illiterates. However, LFPR among these men with very low education levels is less than 60 percent. LFPR for men with secondary and higher education levels are above 70 percent. Finally, LFPR reaches its highest for those with higher education diploma. For women, there is a remarkable positive relation between educational attainment and LFPR. Women with higher education diploma have similar LFPR

with the men having same levels of education. Along these lines, it can be argued that decreasing education gender gap would be critical in increasing female's LFPR.

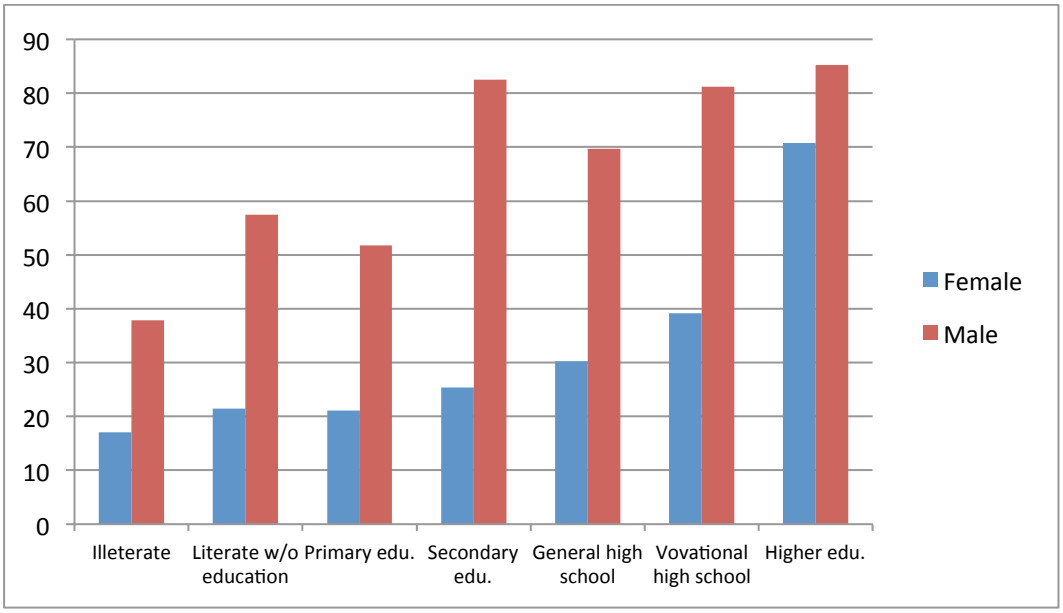

Figure 2.10: LFPR by educational attainment (%)

Source: TURKSTAT.

Turkey should focus on increasing its LFPR in order to achieve 2023 targets. Especially female LFPR should be improved in this regard. There are several tools that Turkey can implement in order to increase female LFPR. First of all, it is important to empower women through increasing educational attainment. Secondly, for elderly individuals, government should provide vocational training opportunities. Thirdly, labor legislations should be redesigned and the provisions limiting women's participation in economic life should be abandoned. Eventhough we haven't provided a comprehensive list of policies, taking concrete steps in these three areas would contribute to a significant increase in Turkey's LFPR. However, increasing LFPR without expanding employment opportunities would feed into unemployment rates. Therefore policy should on increasing both LFPR and employment opportunities simultaneously.

2.2.4. Informality in the Turkish Labor Market

Widespread informality is a salient characteristic feature of the Turkish labor market.[3] As illustrated in Figure 2.11, informality has been following a decreasing trend over the last decade but still remains to be quite high. The share of informal employment in total employment gradually fell from 50 percent in 2004 to 42 percent in 2011.

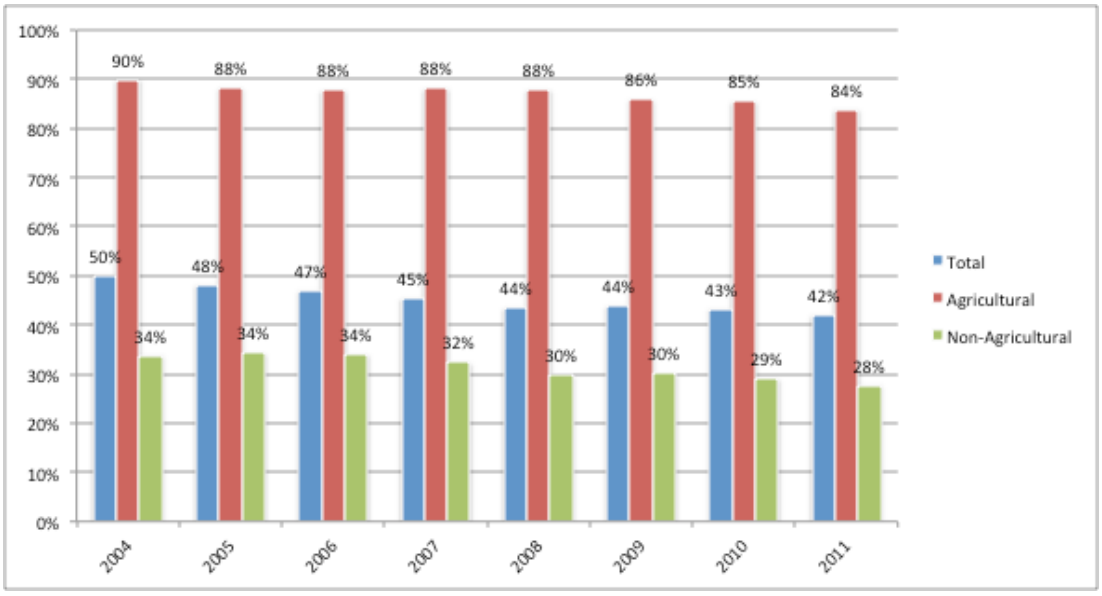

Figure 2.11: Informality in Total, Agricultural & Non-Agricultural Employment

Source: Household Labor Force Survey of TURKSTAT.

When we consider agricultural employment, the figures well-reveal the almost exclusively informal nature of the sector. Hence when agriculture is excluded, share of informal employment falls considerably by around 15 percent, though still following a decreasing trend from 34 percent in 2004 to 28 percent in 2011. Evidently, informal employment accounts for a sizable portion of the Turkish labor

[3] In this section informal employment is defined as working without having any sort of social security following the Turkish Statistical Institute (TURKSTAT). There are a number of labor informality definitions in the existing literature, such as the *enterprise-based definition* which identifies informality based on the size of the production units, the *productive definition* which describes informal status based on the job/work characteristics, or the *legalistic definition* which in practice translates into several measurement criteria such as having a signed contract, belonging to a union, being entitled to benefits such as health insurance or pension, working at the public sector, and paying taxes. For a more thorough discussion on different definition and measurements of informal employment, see Chapter 3.

market, and therefore deserves particular attention regarding its extent, nature, causes and consequences. Along these lines, the following section briefly discusses the incidence of informality in Turkey in terms of its underlying causes, consequences, and coping mechanisms.

Given the characteristics of the Turkish economy and labor market, the level of labor informality is not an unexpected result. The literature lists several underlying factors causing and contributing to informality, which can be broadly grouped into two main categories, i.e. structural factors and regulatory factors. Among the structural factors, the first one concerns the structure of the economy, in which the share of traditional activities is still remarkably high. Concomitantly, share of agricultural employment, where informality is typically the norm rather than the exception, in total employment is significantly higher than it is in the developed countries. Turkey witnessed a large scale rural-urban migration since the 1950s which is expected to continue for the next few decades, whereby the share of urban population which was 20 percent in 1950 has increased to 64 percent in 2006 and is projected to reach 80 percent by 2050 (World Bank, 2006). As a by-product of this transformation came a structural shift in the economy, whereby agriculture as the primary sector of employment and output has gradually been displaced by manufacturing and services sectors. Still, the share of agricultural employment is significantly high especially in relation to its low share in Turkey's GDP and per capita income, hence agricultural informality remains as an important determinant of the overall informality levels.

Similarly, the structure of the corporate sector where 99 percent of the establishments is comprised of small and medium size enterprises, adds to the informality problem given the fact that informality is mostly a small firm phenomena.

The third structural factor concerns the demographics of the labor market, in the sense that age, gender and human capital strongly affect the prevailing informality levels. As Figure 2.12 illustrates, female workers display considerably higher levels

of informality, which significantly drags the overall informal employment upwards. The share of informal employment for females is 60 percent in 2011 as compared to that of male workers, which stands at 36 percent. Indeed, female informality constitutes a crucial problem of the labor market, which requires deliberate action. Age is also another important determinant of informality, in the sense that young and older workers exhibit higher likelihoods of working as informal compared to that of middle age workers. As with many developing countries, Turkey has been witnessing a substantial demographic transition since 1950s, from high to low rates of mortality and fertility. The crude birth rate of 50.8 per thousand and the crude death rate of 23.5 percent per thousand yields a sizable population growth rate of 2.7 percent (World Bank, 2006), thereby yielding an age structure that is skewed towards younger ages. This demographic shift is projected to continue until 2050, hence plays a key role in determining the informal employment dynamics.

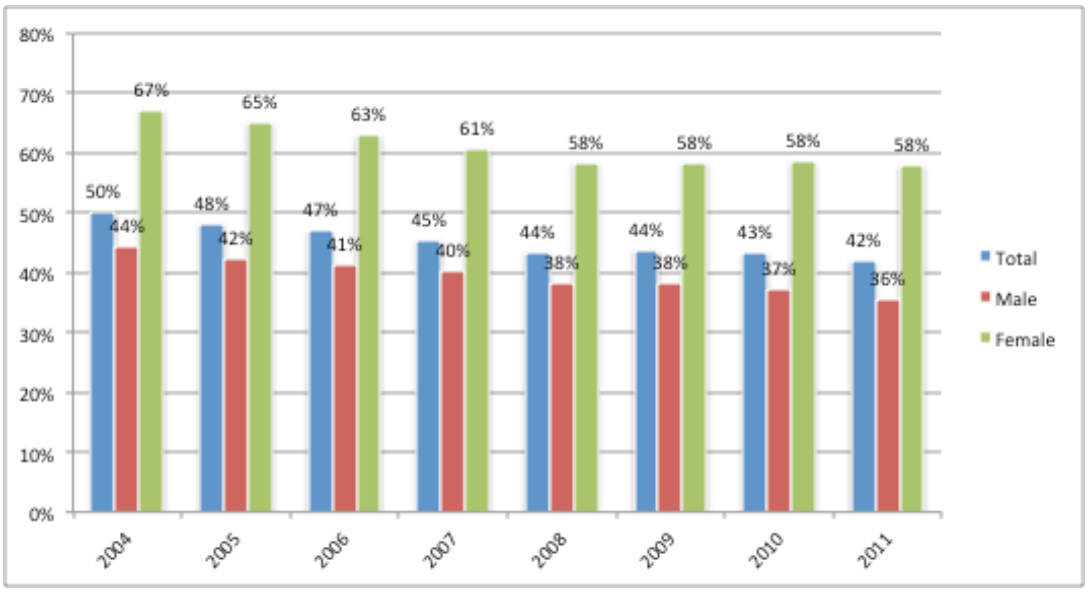

Figure 2.12: Share of Informal Employment (Total, Male and Female)

Source: Household Labor Force Survey of TURKSTAT.

Regarding human capital, average educational level of the working age population is considerably low by OECD and EU standards. Ercan (2011) reports that the median

education in the labor force is still primary. Given the fact that informality is typically a low-skill phenomenon, it is not surprising that informal employment is such a common practice in the Turkish labor market. Moreover, significantly poorer levels of education among women also aggravate the informality incidence.

Forth structural factor is related to the social norms in the society. In fact, working or employing informally has a high degree of acceptance in Turkey. Under many circumstances, social security coverage is negotiated between employers and employees in order to refrain from tax or other state contributory costs. Furthermore, being informal is not even a negotiation item but taken as granted for some positions, i.e. unpaid family work.

The institutional and regulatory factors of informal employment are manifold. World Bank (2010) lists the most cited as the burdensome regulations (i.e. high firm entry costs, strict labor market regulations, high taxes, complicated procedures), low levels of institutional quality (i.e. corruption, weak rule of law, lack of accountability), low quality of public services, low trust in institutions, low monitoring and enforcement, structure of the pension system, and the level of the minimum wage.

Regarding the burdensome administrative requirements and costly labor market regulations, Turkey ranks 133th among 142 countries in the World Economic Forum's labor market efficiency ranking. World Bank (2006) reports that the employment regulations in Turkey, particularly the Employment Protection Legislations (EPL), have typically been rated as stricter and more restrictive than that of many other countries. First, severance pay in Turkey is currently one of the highest among OECD countries. As per se, for 20 years of service, a worker is entitled to receive 20 months compensation in Turkey, in contrast to 6 months in OECD members, 4 months in Europe and Central Asia countries (World Bank, 2006). The severance payments are intended to circumvent layoffs, and are in fact beneficial for those who are employed. On the other hand, high severance payments act as a barrier for new entries, and push

employers into informal employment. Second, restrictions on temporary employment and fixed-term contracts contribute significantly to the informality incidence. World Bank (2006) reports that the legislation, which aims to maintain employers' compliance with severance and pension obligations, indeed discourages employers to involve in permanent contracts with high compliance costs and prefer informal labor which is less costly. Third, tax wedge on labor, which is defined as the difference between workers' net pay and costs to their employers, is ranked among the highest in the world. Social security contributions and payroll taxes, which are high by OECD standards, constitute disincentives for formal employment.

Another important determinant of prevailing informality in the Turkish labor market is the exceptionally generous retirement schemes, which encourage individuals leave labor market at very early ages, and then either drop out of the labor force or engage in informal economic activities. Brook and Whitehouse (2006) argue that despite the amendments in the social security reform, the pension system still continues to impede formalization through early-retirement incentives which push several incumbent formal sector workers into the informal sector at ages as young as 40-45, and the high social security contribution rates which makes employing low-skilled labor in the formal sector too costly. Until 1992, Turkish pension system stipulated a minimum retirement age threshold of 60 for males and 55 for females, and a minimum premium payment equivalent to 5000 days of work. Law No.3774, which was passed in February 1992, pledged a minimum period of social security system attachment for 25 years for males and 20 for females (World Bank, 2006). In 1999, the minimum age thresholds were reinstated at 60 for male and 58 for female, and minimum premium payment requirement was increased to 7000 days of work. With the latest reforms, which came into force in October 2008, benefit entitlements and incentives for early retirement were reduced to a large extent. In particular, retirement age is increased from 60 and 58 for men and women, respectively, to 65 for both, and the number of minimum contribution days is increased from 7000 to 7200 (OECD, 2009). However, these stipulations will be phased in gradually and become effective

for age cohorts born after 1980, therefore will only be effectively reducing informal employment in the long run.

Also aggravating informality in the labor market is the minimum wage at around 60 percent of the average wage, which is rated as one of the highest in the world relative to its average income. OECD (2008) reports that "in most countries where the minimum wage is binding in the formal sector, (i.e., where a higher minimum wage is found to lead to a fall in formal employment), there is an associated higher rate of informal sector employment". The policy, which is designed to provide a decent standard of living for low-end of employed individuals, on the other side undermines formal employment levels especially when minimum wage is high relative to average wage. In fact, World Bank (2006) reports that the minimum to average monthly wage in Turkey increased markedly from 1999 to 2004.

The low levels of institutional quality, low quality of public services, low trust in institutions, and low monitoring and enforcement also constitute significant causes for informality. If people believe that the benefits of getting under the umbrella of formal employment are only limited, i.e. poor social protection services, they tend to consent with informal employment. Also, if there is no trust in government in the sense that laws and regulations are practiced and enforced uniformly across all, a sense of unfairness will emerge and create disincentives for formality. Indeed, these are quite common practices in the Turkish economy, which aggravate the informality incidence to a great extent.

Informal employment has significant costs not only to the individual but also to the economy and society as a whole. For the individuals, the adverse implications of informal employment are manifold. Most eminently, informal workers are typically subject to higher risks of and unprotected against unemployment, occupational, job security and health related hazards. Moreover, they are not eligible for the benefits of formal employment such as occupational training, pay rises and well-defined career

plans. From the economy-wide viewpoint, informal activities work to deteriorate the fiscal balances by reducing the tax and social security gains that are later used for the public provision of goods and services to the society. This translates into resource losses for the economy and subsequent setbacks in the social protection system. Moreover, informality causes unfair competition in the economy, since those firms who choose to operate with compliance to the laws and regulations are put in a disadvantaged position. This clearly reduces overall productivity of the economy and harms the sense of equity, employment ethics and rule of law in the society, which will aggravate the situation even worse.

Along these lines, reducing the level of informality has important implications for both individual employees and employers, and the society and economy as a whole. As per employee standpoint, this means health services and pension benefits; being protected by the state and the rule of law; protection against certain labor market risks (i.e. unemployment, occupational hazards, job losses). Whereas for employers, this translates into elimination of the dual structure in the economy and unfair competition practices; hence higher institutionalization, access to resources and productivity. From the aggregate economy viewpoint, reducing informality will increase fiscal gains of the state (i.e. taxes, social security contributions); improve public provision of goods and services; provide stability in the economy and help sustain social welfare.

Against this background, the need for reducing informality becomes exceptionally obvious. OECD (2010) states that "impediments to higher employment need to be removed to overcome the entrenched dualism between the highly productive and well protected jobs in the formal sector and low-productive and unprotected jobs in the informal sector". There are several measures to reduce informality. Most importantly, an effective initiative for fight against informality requires a comprehensive and well-targeted strategy. Two essential pillars for such a strategy should be improving public awareness on the costs (benefits) of informality (formality) at both employer and

employee levels, thereby encouraging their participation in formal activities. The second one is based on implementing fair, efficient and well-designed labor market regulations, which may incorporate both dissuasive and punitive sanctions. Along these lines, policy makers could use several tools to reduce the level of informal employment and its adverse effects on the economy and the society. Tunç (2006) collects and well-summarizes these measures under seven main headings as:

- Restructuring the existing system by reducing high labor costs such as high social security premiums or other taxes on employment which contribute greatly to unemployment and informality in the labor market; and by reducing the burden and complexity of bureaucratic processes (i.e. opening licenses, excessive requirements for employing domestic or foreign workers, etc.) which push both employers and employees into informality.
- Enforcing informal enterprises to move into the umbrella of the formal sector through improving and strengthening auditing; increasing communication and coordination between relevant institutions; reinforcing deterrent punishments (i.e. administrative monetary sanctions, license revocations, ban of operations, prison sentences, ban of joining public tenders, etc.) for those enterprises that employ informal workers.
- Forming effective social dialog mechanisms, which incorporate public authorities, employers and employees, and stimulate their participation and collaboration.
- Changing attitudes and behaviors on informality, by improving the individual and public awareness on the benefits of formal employment, social security protection and the conscious on the adverse consequences, through education at school, media organs, local and national campaigns, etc.
- Designing and implementing active labor market policies such as vocational education, efforts to skills acquisition, occupational and career consultancy, supporting establishment of new firms and occupational rehabilitation, which improve chances of formal employability of individuals.

- Fighting with unemployment, inflation and poverty which are major drivers of informality, as in such cases individuals often have to consent with informal jobs as a survivalist alternative when employment opportunities are limited.
- Improving the social security system and designing well-established norms and standards, since an inefficient social security system (i.e. green card, voluntary social security contributions, early retirement schemes, social security contribution remissions, tax remissions) aggravates informality.

The government of Turkey has been working decisively to reduce informal economic activity and promote formalization since the opening of accession negotiations with European Union in October 2005.[4] Moreover, this effort is set as a priority agenda in the Ninth Development Plan (2007-2013). In particular, a comprehensive action plan "The Struggle Against Informal Employment" (KADİM) has been launched under the aegis of Ministry of Labor and Social Security. The project was initially focused on informal employment of illegal foreign employees (Ben Salem et al., 2011). More recently, the Government has incorporated fight against informality strategy as a separate section into its Annual Programs. A broader programme, namely "Struggle Against the Informal Economy Action Plan", was put into action under the leadership of the Revenue Administration among several other institutions in 2009. The comprehensive and resolute plan identifies three main targets (i) promoting formal activities; (ii) strengthening audit capacity and increasing the deterrence of sanctions; (iii) establishing and strengthening institutional and societal consensus (World Bank, 2010). The 2008-2010 Action Plan of Strategy for Fight Against the Informal Economy details the measures undertaken by the Government some of which are the establishment of "Coordination Office of Fight Against the Informal Economy" in part of Strategy Development Department of Ministry Labor and Social Security; increased number and frequency of audits in such sectors where the informal employment is high; and recruitment of new personnel for auditing. As reported in

[4] For a comprehensive and detailed discussion on the regulations and measures undertaken by the Turkish government to reduce informal economic activity, see Tunc (2006).

OECD Economic Survey of Turkey (2010), an integrated approach with indispensible labor market regulations and regulatory reforms is essential to boost the ongoing formalization initiative.

2.3. Conclusion

The Turkish economy has been experiencing a deep structural transformation especially for the last three decades. Liberalization efforts of the 1980s strengthened Turkey's economic ties with the world. However, institutional infrastructure of the country was not strong enough to make Turkey resilient to negative external shocks. As a result, Turkey incurred a high cost of being an open economy with substantial institutional infrastructure deficits during 1990s. The economy was on a roller coaster with significant boom and bust cycles. It was only after 2001 economic crisis that the country ensured macroeconomic stability with the implementation of the IMF-backed structural adjustment program. Favorable global economic conditions were also helpful in achieving macroeconomic stability. Followingly, the Turkish economy has grown rapidly between 2002 and 2008. In 2009, however, it was hit hard by the global financial crisis and became one of top ten fastest contracting economies. Whereas in 2010, the economy recovered strongly and this time it became one of the fastest growing economies in the world. However, it should also be noted that the Turkish economy has significant vulnerabilities, the most significant of which is the high current account deficit threatening the sustainability of the growth process.

Concurrently, Turkey's labor market dynamics have been changing to a significant extent for the last three decades. Rapid urbanization fuels labor flows from traditional to modern activities boosting overall productivity level of the economy. Turkey's demographic dynamics, including the falling dependency ratio, are also favorable for the economic growth. However, low labor force participation, high unemployment, and prevalent informality in the Turkish labor market decreases the chances of fully benefiting from the favorable demographic trends.

Against this economic and labor market background, this thesis investigates the labor informality phenomenon in Turkey. The coming chapters delve into the nature of informality in the Turkish labor market in terms of its definition and measurement in the Turkish context; the extent and dynamics of worker transition patterns into and out of informality; and earning performances of the formal and informal workers.

CHAPTER 3

DEFINING AND MEASURING LABOR MARKET INFORMALITY IN TURKEY

3.1. Introduction

Labor informality is one of the most prominent economic and social phenomena of our era. The extent of its scope and persistence, causes and consequences are drawing extensive interest within global and national development agendas. Yet, paucity of data and conceptual clash of its various definitions impede robust analyses. Notwithstanding, an improved understanding of the concept and its dimensions is crucial given its severity and pervasiveness. The resultant ample literature on labor informality comprises several attempts to gauge its extent in various countries, to identify its causes and consequences, to establish comparable stylized facts and to devise economic models for policy makers (Batini et al., 2010, p. 4). Most analyses though coincide in recognizing the fact that conclusions will be considerably sensitive to the particular definition and measurement used, diverge in employing different characterizations. Indeed, there is no single uniformly accepted definition of informality. Concurrently with the development of informality theory, the empirical configuration of informal employment has displayed its own evolution in many ways. Indeed, there exist a multiple number of definition and measurement methods in the literature, tailored specifically to different time and space contexts. Similarly, the official measures provided by the International Labor Organization (ILO) cannot be applied exclusively due to data limitations and contextual peculiarities. Nevertheless, a well-grounded conceptual framework is of paramount importance for policy makers to accurately examine the nature and dynamics of the phenomenon. Following this

line of thought, this study aims to provide new insights into the existing literature in terms of definition and measurement of informality in the context of the Turkish labor market.

A better understanding of the definition and measurement of labor informality is of utmost importance in such a developing country context for many reasons. Firstly, as Perry et al. (2007) argue: "The term informality means different things to different people, but almost always bad things: unprotected workers, excessive regulation, low productivity, unfair competition, evasion of the rule of law…". Moreover, particular vulnerable groups such as young, women and migrants are often disproportionately represented in informal employment. Therefore, diagnosing the extent of informal employment is crucial for identifying the risks and sources of socioeconomic inequality, especially for the vulnerable. Second, informal employment became an essential component of a developing country economy in the context of globalization and its far-reaching influences on national economies. Its concomitant impacts in the labor markets and employment structure necessitate a more thorough apprehension of informal employment dynamics and its linkages to formal employment for well-informed policy-making. Third, informality is a multifaceted phenomenon which in practice refers to several types of workers and activities, ranging from informal employees of informal or formal enterprises to unpaid family workers, and from marginal own-account workers to prosperous employers. The famous *informal sector elephant* metaphor proposed by Hernando de Soto is based on this aspect. Therefore, as Jütting et al. (2008, p. 6) state, defining and comparing informal employment in multiple ways enables comprehending distinct facets and dimensions of the phenomenon.

Against this described background, the objective of this chapter is to propose a comprehensive and holistic conceptual framework that can be used as a well-grounded initial step to detailed analysis of informal employment in the Turkish labor market. Given its economic and demographic dynamics, Turkey indeed provides rich

evidence for a growing, heterogeneous and multifaceted informal labor market (Tansel, 1997, 1999, 2001; Bulutay, 2000; Bulutay and Taştı, 2004; Özdemir et al., 2004; SPO, 2009; Kenar, 2009; Reis et al., 2009; Aydın et al., 2010; OECD, 2010; World Bank, 2010; Ercan, 2011). However, existing evidence is mixed and scant. Data limitations and conceptual obscurity impede generalizable and comparable analyses. This chapter aims to elucidate the informalization in the Turkish labor market in terms of its definition, measurement and salient characteristics. In doing this, following criteria are seeked for the most proper definition: (1) consistent with the international guidelines; (2) allow for comparability with other international studies; (3) able to capture the salient characteristics of the Turkish labor market and formal/informal employment dynamics; (4) responsive to variations in time; (5) measureable by simple, straightforward criteria which are applicable to all available individuals and employment types; (6) measurable by available data.

Before addressing informality in Turkey, we briefly review the set of guidelines provided by the International Labor Organization (ILO) and how they evolved over time. Jütting et al. (2008, p. 6) state that there is no single internationally accepted and operational definition or indicator of informal employment but a set of definitions and indicators. The international guidelines provide a framework of recommendations and techniques for measuring informality that can be tailored to the specific context and available data. However, one should always keep in mind that each definition, in fact, describes a different aspect of multiple dimensions of informality phenomenon. Nevertheless, the prescriptions of ILO and international literature form the basis of our analysis, though modified in a way to be applicable to the peculiarities of the Turkish labor market and available data.

The empirical analysis consists of developing three alternative definitions of labor informality, gauging the extent of their association, and exploring the relevance and implications of each for the Turkish labor market using several other individual and employment characteristics. First, is an enterprise-based definition which describes

informality with *employment in the informal sector*, where informal sector refers to small firms and self-employment. Then this definition is modified in a way to comprise *informal employment* in both formal and informal sector, by incorporating the social protection aspect of employment. In particular, those workers who work in formal sector but have no social security are re-classified as informal, and those who work in informal sector but have social protection are re-categorized as formal. The third one is defined exclusively on social protection coverage independent of the nature of the sector one is employed. Then, informality based on these definitions are analyzed and compared in multiple dimensions including age, gender, education, household size, geographical region, economic sector, establishment size and employment status. The first part of the analysis is descriptive in nature and meant to determine the degree of congruence between alternative definitions and decompose the structure of labor informality in Turkey. In addition, a large time span is adopted to trace likely transformation dynamics. Next, we conduct a multivariate analysis in order to explore the likelihood of informality using various personal and job attributes as explanatory variables.

The main data source for this study is a panel data set drawn from the Turkish Income and Living Conditions Survey (SILC), which is produced by the Turkish Statistical Institute (TurkStat) for the period 2006-2009. Subsuming a rich set of information on household expenditure, income and assets, employment and living conditions, SILC enables defining and investigating informality in multiple ways, thereby comparing the relevance and implications of different specifications. Of particular importance for this study are the employment status, social security registration, occupation and firm size variables. Furthermore, the data set includes several other variables of personal, household and job characteristics such as age, gender, education, household head status, household type, marital status, work experience, sector of economic activity, and others which are typically thought to constitute underlying dynamics of being informal or formal. This study is the first to use the SILC data set to examine informality in terms of its definition and nature.

To the best of our knowledge, this analysis is the first attempt to study different definitions and measures of informal employment in Turkey. Moreover, the analysis is linked to the evolution of theory of formal and informal labor markets, hence provides a synthesis of empirical and theoretical literature in the context of Turkey. Moreover, thanks to the novel nature of SILC data set, time span of this study allows exploring the existence and extent of any effect of global economic crisis in the Turkish labor market along the formal/informal divide. Along these lines, ultimate objective is to improve the understanding of informality concept, thereby stimulate vigorous analyses of the labor markets and policy.

The chapter is organized as follows. The next section is dedicated to the review of literature on the definition and measurement of informal employment. In particular, Section 3.2.1 presents existing theoretical and empirical literature, and Section 3.2.2 addresses previous Turkish evidence. Section 3.3 describes the data, definition of main variables and empirical methodology used in the study. Section 3.4 presents a comprehensive descriptive analysis of different definitions of informality in the Turkish context along various dimensions. In Section 3.5, results of the multivariate analysis are discussed. Section 3.6 provides conclusions and implications for policy.

3.2. Literature Survey

3.2.1. Conceptualizing Labor Informality - Theory, Definition and Measurement

The debate around the definition and measurement of informal employment has a long history. The initial formal versus informal divide of economic activities and employment can be traced back to the dual economy theory, introduced by Lewis (1954), Kuznets (1955) and Harris and Todaro (1970), which explained economic development by the emergence and growth of the *modern* manufacturing sector through absorbing labor from the *traditional* agriculture sector (Bromley, 1978, p. 1033). Hart (1973) extended the dualist terminology by decomposing the economy

into *formal* and *informal* sectors analogous to modern and traditional sectors, respectively. In this way, he first coined the term informal sector to describe self-employment and small enterprises activities of *the reserve army of urban unemployed and underemployed* to generate income (Hart, 1973, p. 88). Following this line of research, the first official definition which was introduced by the International Labor Office (ILO) characterized informality with easy to enter, unregulated markets; small scale or family owned enterprises; reliance on indigenous resources and labor intensive technology; low skilled labor; and few links with the rest of the economy (ILO, 1972, p. 25). The seminal theory of informal labor markets, named as the *traditional*, *segmented* or *exclusion* approach was built on these studies. Traditional theory views informality as a survivalist alternative for those who are disadvantaged when formal employment opportunities are limited (Fields, 1975; Mazumdar, 1976; Bernabe, 2002; Perry et al., 2007: in Yu, 2012, p. 3). Moreover, formal and informal markets are regarded as segmented, with either limited or no mobility (Fields, 2005, p. 8). The segmentation is the result of labor market rigidities that impede effective competitive wage setting mechanisms in the formal sector. Those rationed out of the formal sector then work as informal to survive, while queuing up for a position in the formal sector. The most discernible characteristic of traditional theory is that informal employment is typically assumed as unconditionally inferior to formal employment.

With the publication of Hernando De Soto's (1990) book, which postulated that informality might also be a rational response to the excessive and burdensome state regulations, earlier views of informality were put under review. More specifically, traditional theory was questioned extensively for assuming a descriptive rather than an explanatory approach, a rigid formal/informal segmentation premise, a negligible and marginal informal sector view, and an involuntary, subordinated informal employment presumption. These critics bred a new strand of literature, which highlighted the fact that informal employment may equally well be voluntary based on private cost-benefit calculations of individuals and firms (Magnac, 1991; Pradhan and van Soest, 1995, 1997; Cohen and House, 1996; Marcoullier et al., 1997;

Maloney, 1999; Saavedra and Chong, 1999; Gong and van Soest, 2002: in Henley et al., 2009, p. 1). This view is named as *competitive* or *integrated* labor markets or *exit* theory (Gindling, 1991; Fields, 2005; Maloney, 2004; Perry et al., 2007). The underlying idea is well summarized in Henley et al. (2009, p. 1) as:

> *The alternative views share the idea that informal activity may be freely chosen by some workers. These individuals either perceive state social protection to be poor "value for money" or do not wish their employment relationship (such as hours of work) restricted by tight state labor market regulation. Alternatively, they may be attracted by the prospective job satisfaction or income stream associated with a successful transition into entrepreneurship, or may perceive the relative benefits of illegal or unregistered activity to outweigh the risks of detection."*

A third view, originated by Fields (2005), emerged as a synthesis of the traditional and competitive labor market hypotheses. The main framework postulates a heterogeneous informal sector comprising an *upper-tier* which coincides with the competitive theory in the sense that informality is voluntarily; and a *lower-tier* which represents the traditional theory in the sense that informality is often involuntary for those who cannot afford to be unemployed but have no hope for a formal sector job (Fields, 2005; Henley et al., 2009).

Against this theoretical background, definition and measurement of informal employment have displayed its own evolution in many ways. Resultantly, there exist a multiple number of methodological specifications in existing literature, tailored to different time and space contexts. An extensive review of literature is beyond the scope of this study; nevertheless we briefly present some of the most prominent methods so as to establish grounds for an empirical framework.[5]

[5] For a more holistic conceptual discussion of the evolution of informality concept, see Kanbur (2009). He argues that the issue is often more complex than simply using the generic labels formal/informal, and that a single definition distinguishing between the formal and informal obscures the existence of varying levels of informality. According to Kanbur, there are four levels of informality: "(i) Stay within the ambit of the regulation and comply, (ii) Stay within the ambit of the regulation but not comply, (iii) Adjust activity to move out of the ambit of the regulation, (iv) Outside the ambit of the regulation in the first place, so no need to adjust" (Kanbur, 2009, p. 5). In his view, formal/informal dichotomy should be thought in the context of specific regulations and relationship of economic activity with this precise regulation framework.

The first internationally agreed definition was adopted in the 15th International Conference of Labor Statisticians (ICLS) in 1993. Informal employment was defined as comprising of "all jobs in informal sector enterprises, or all persons who, during a given reference period, were employed in at least one informal sector enterprise, irrespective of their status in employment and whether it was their main or secondary job" (Hussmanns, 2005, p. 3). The informal sector enterprises were defined as:

> *units engaged in the production of goods and services with the primary objective of generating employment and incomes to the persons concerned. These units typically operate at a low level of organization, with little or no division between labor and capital as factors of production and on a small scale. Labor relations – where they exist- are based mostly on casual employment, kinship or personal or social relations rather than contractual arrangements with formal guarantees."* (ILO, 1993)

Under this definition, informality is identified based on the characteristics of the production units (enterprises) in which the activities took place, rather than in terms of the characteristics of the worker or the job. Hence, it is named *enterprise definition* of informality. This approach is the longest established in the existing theoretical and empirical literature. It dates back to the earliest analyses, which described informal sector with self-employment and micro-scale enterprises. The unit of observation is enterprises and main measurement criterion is the number of workers in an enterprise. However, there exists no single, universally-accepted empirical measure, since what "small or micro" refers to vary in different data sets available in each country. To name a few examples, ILO's measurement of informality based on enterprises that have five or fewer workers is also used by Rani (2008), De Paula and Scheinkman (2007) for Brazil and Juarez (2008) for Mexico. Maloney (1999), however, uses a definition of fewer than six employees for Mexico; Marcoullier et al. (1997) use fewer than six for Mexico and Peru; Cohen and House (1996) use fewer than twenty for Sudan; Livingstone (1991) uses fewer than ten for Kenya. Later in 1997, in order to increase comparability between countries, this definition was fine-tuned in the International Expert Group of Informal Sector Statistics so that informal sector would refer to "private unincorporated enterprises, which produce at least some of their

goods and services for sale or barter, have less than five paid employees, are not registered, and are engaged in non-agricultural activities" (ILO, 2002).

The enterprise definition was later criticized for being ambiguous and exclusive. The underlying arguments were that it might fail to capture those marginal micro-scale informal activities which are often unreported by individuals or correctly identify those informal activities which are typically at the borderline between wage and self-employment, and that it cannot fully capture the increasing variety of informal employment forms (Hussmanns, 2004, p. 1).

Along these lines, a broader informality specification relating the enterprise-based concept of *employment in the informal sector* to a job-based concept of *informal employment* was adopted in 17th ICLS in 2003 (Hussmanns, 2004, p. 5). In a nutshell, Chen (2007, p. 31) recapitulates the new labor informality concept as comprising of self-employed in informal enterprises (i.e. workers, employer/owner of small firms, own-account workers, unpaid family members); and wage employment in informal jobs (i.e. employees in informal enterprises, casual and domestics workers). Informal jobs refer to jobs that are not subject to legal or social protection, or more clearly "if their employment is not subject to national labor legislation, income taxation, social protection or entitlement to certain employment benefits".

The new approach, combining both enterprise and job-type characteristics, is named the *productive definition* of informality. It has been used extensively in empirical and theoretical research in several variations. Funkhouser (1996, p. 1740) describes workers in firms of four or fewer employees who are not professional, technical or administrative workers and all the self-employed as informal in a Central America study. Pradhan and van Soest (1995, p. 294) classify the work in firms of less than six employees and unprofessional self-employment as informal for Bolivia. Gasparini and Tornarolli (2007, p. 3) consider an informal worker to be either an unskilled self-employed, zero-income worker or a salaried worker in a firm with five or fewer

employees for a Latin American and Caribbean analysis. Galli and Kucera (2004, p. 874) associate informality with employment in firms less than five or ten workers, depending on the country, unpaid family workers and domestic workers and self-employment - excluding administrative, professional and technical workers- in a comparative study across Latin America. In a Mexican analysis, Khamis (2009, p. 10) looks at the self-employed and bosses in firms with five or fewer workers. Henley et al. (2009, p. 996) classify workers in firms with less than five employees, self-employed and employers who are not professionals and all domestic, non-remunerated, subsistence and temporary workers as informal for Brazil.

More recently, a third strand emerged in parallel to the need for a more comprehensive definition and advances in data sources. The idea was to expand the definition of informal employment to encompass the increasing variety of informal activities and workers. This was done by transiting from an enterprise-based approach to a worker/employment-based approach. The main idea was that informality should be defined and measured in terms of legal status of employment, rather than firm or job characteristics (Henley et al., 2009, p. 6). In official ILO terms, an employment relationship is considered to be informal if it is not subject to labor legislation, social protection, taxes or employment benefits (Hussmanns, 2005, p. 7). In practice, the definition translated into several measurement criteria such as having a signed contract, belonging to a union, being entitled to benefits such as health insurance or pension, working at the public sector, or paying taxes (Saavedra and Chong, 1999, p. 100). The social security and contract status are by and large the two most common criteria used in applied research. It is referred to as *legalistic, contract-based* or *social protection* definition of informality.

Following this definition, Amuedo-Dorantes (2004) and Packard (2007) use lack of a work contract; Merrick (1976), Portes et al. (1986), Bosch and Maloney (2005), Loayza et al. (2009), Mondragón-Vélez et al. (2010) lack of social security/pension contributions; Henley et al. (2009) both no signed labor card and no social security

contribution; Gasparini and Tornarolli (2007) no right to a pension when retired; Saavedra and Chong (1999) compliance of firm or individual with the rule of law; Cardenas (2007) all employment that is not reported to official institutions to identify informal employment.

The choice of definition and measurement depends primarily on the available data. Meanwhile, analyses and conclusions will be considerably sensitive to how labor informality is defined and measured. That being the point of departure, a number of studies investigated the degree of congruence between different measures and endeavored to determine the most appropriate specification for the particular context. Bernal (2009) constructs a list of 27 possible definitions of informality for Colombia, analyzes their differences and implications. He uses pairwise correlations between these alternative measures and finds non-payment of social security contributions as the preferred measure. The argument is that this measure is highly correlated with most definitions which are defined based on other criteria such as existence of a written contract, firm size, availability of job benefits, etc. Moreover, it clearly identifies vulnerable workers, and allows easy measurement with available data and comparability with other countries.

Henley et al. (2008, p. 996), using data from Brazilian household surveys, construct three definitions of informality, based on employment contract status, social security protection and, the nature of the employment and the employer. For the third one, they identify a worker as informal if he/she works as a domestic, unpaid, subsistence or temporary worker; or as self-employed or employer in occupations other than professionals. The probit analysis of the likelihood of informality according to several individual and job characteristics show that three definitions display significant variety in their level and nature of association with some characteristics. To name a few, informality based on contract status turns out to be far less strongly related to education, social protection based definition is the only one to capture rural/urban and informality relationship but less strongly match with family circumstances. Along

these lines, Henley et al. conclude that precise definition of informal employment influences the analysis to a remarkable extent.

Khamis (2009) applies social security, contract, self-employment in small firms and illegal migration measures to highlight various dimensions of labor informality using Mexican survey data. More specifically, she identifies informality based on whether a worker has social security, a written contract for the current main job; migrated to U.S. without the legal documentation; works as self-employed or employer in small firms with size one to five. She estimates probit models to examine the effects of individual and household characteristics in the propensity to be formal or informal under each of these four measures. The main motivation in this study is different from ours in the way that rather than comparing the relevance and congruence of different definitions, Khamis examines the individual implications of each measure. She finds that legalistic definitions of informality, based on contract and social security status, are significantly correlated with each other and strongly associated with one's age, marital status, education level and ability.

Gasparini and Tornarolli (2007) examine the main patterns and trends of two alternative definitions of informality in Latin America and Caribbean context. The first definition is the productive definition which associates informality with low-productivity in small-scale and often family-based activities. More specifically, under this definition self-employed are classified as informal if they are unskilled, that is if they do not have a tertiary education degree. Workers, on the other hand, are identified as informal if they work as salaried workers in small firms with less than five employees. For the second definition, namely legalistic or social protection definition, they use having a right to pension as the measurement criteria. They find that a significant share of workers classified as formal under productive definition are informal when defined according to social protection, whereas a great majority of those who are informal in the productive sense are also informal according to the social protection approach.

Other studies have also examined the differences and implications of alternative informality definitions, but often with an aim to complement their main research in question. To name a few, Gong et al. (2004) compare job-type, firm size and social security coverage definitions, Marcouillier et al. (1997) and Saavedra and Chong (1999) compare the firm size with social protection definitions and conclude that the latter one is more appropriate.

3.2.2. Overview of Labor Informality in Turkey

Labor informality is a widespread and still growing phenomenon in Turkey. Most of the early studies addressed its causes and consequences, whereas recent research concentrates more on defining and measuring the extent and nature of its incidence, and understanding its variant dimensions and underlying dynamics. In parallel to advances in the availability and quality of micro-level household and firm surveys, alternative definition and measurement techniques became feasible in empirical work, thereby empowered a more thorough and comparable analysis.

In Turkey, the informal sector concept was officially articulated for the first time by the Turkish Statistical Institute (TurkStat) in 1988 Household Labor Force Survey (HLFS). Size, legal and residency status of the firm were used to describe the concept (Toksöz and Özşuca, 2003, p. 50). Later, TurkStat identified the official criteria of informal employment in HLFS as being employed without registration with social security system. That is, informal or unregistered employment comprises "persons who are not registered to any social security institution due to main job worked in reference week" (TurkStat, 2011). The most recent rate of informal employment using this definition is reported as 43.4 percent in 2011.

To name some of the most influential studies, Tunalı and Ercan (1997) in their seminal work analyze the segmentation on the Turkish labor market through wage differentials. In this study, they employ firm size measure, dividing the labor force

into two segments of those who work in small firms with 10 or less employees and large firms with more than 10 employees based on the 1988 HLFS. Tansel (1999), also investigating wage differentials, applies another definition for formal/informal divide. She identifies the wage earners with social security as the formal sector and those without as the informal sector, using 1994 Household Expenditure Survey (HES). Bulutay (2000, p. XLVIII-V) uses a job-based measure of labor informality, defining own-account workers, unpaid family workers, employees and employers in firms with less than four workers as informal. Togan (2001, p. 100) also takes the job-based approach, and identifies own-account workers, employers, and unpaid family workers to form informal employment. Levent et al. (2004) classify formal and informal sectors based on both social security registration of the worker and firm size criteria using the Household Labor Force Survey (HLFS) for 2004. Kenar (2009), in a comprehensive analysis of informality in Turkey, addresses multiple dimensions and definitions of labor informality at several levels in the labor market. When defining informal employment, he also uses social security registration status.

Considering its high levels of prevalence and multidimensionality, labor informality in Turkey has drawn a significant amount of interest from international organizations. OECD, in a recent report, provides an extensive analysis on informal employment in Turkey. In this study, informality is measured in multiple layers, including employees not registered for social security, own-account workers, unpaid family workers, multiple job holders and percentage of workforce not reported for tax purposes (OECD, 2008, p. 86). World Bank has recently published a comprehensive Country Economic Memorandum (CEM) about informality in Turkey. In this report, World Bank classifies all employees (wage-earners, self-employed and entrepreneurs) who are not registered with the Social Security Institution as informal (World Bank, 2010, p. 9). This choice is grounded on the facts that job-based approach is found rather arbitrary, data is readily available and the implications of social protection status are extensive. In a background paper for the World Bank study, Reis et al. (2009, p. 7) employ two measures for informal employment: the share of self-employed as a

percentage of the total labor force using ILO's labor force surveys and workers that are not registered to social security using Household Labor Force Survey (HLFS) of TurkStat and World Development Indicators (WDI) of the World Bank.

3.3. Data and Methodology

Given the importance of understanding the nature of labor informality, this study endeavors to provide an extensive snapshot of the incidence in the context of the Turkish labor market. Following this line of reasoning, we analyze various dimensions, transformation over time, relevance and implications of different specifications of informality. For this particular purpose, survey based, individual level micro data is the most appropriate. The data set used in this analysis is drawn from the "Income and Living Conditions Survey (SILC)", which has been conducted by the Turkish Statistical Institute (TurkStat) since 2006. The novel, nationally representative, rich nature of the survey makes it unique and invaluable for the aim and methodology of the study. It provides detailed information on the employment status, social security coverage, working hours, labor and other income, demographic characteristics, living conditions, job characteristics, and socioeconomic conditions of the subjects. The survey results have only recently been released in micro data sets, thus to our knowledge have not yet been used in any other studies of informality.

SILC is indeed designed as a rotating panel in which the sample of households and corresponding individuals are traced annually for four consecutive years. Each year the survey is conducted for four subsamples, and one subsample is removed and replaced by a new subsample. The samples are selected and assigned survey weights to be representative of non-institutionalized Turkish resident population. A two-stage stratified sampling procedure is used in sample selection. The interviews are administered once every year. The sample size is designed considering possible non-response, thereby no replacement is undertaken.

The survey results are published annually in both cross-section and panel data formats. The analysis below focuses mainly on the cross-sectional data for the years 2006, 2007, 2008 and 2009, since the micro data set for the following years are not yet released. The original cross-sectional samples consist of 30,186 individuals for 2006; 30,263 individuals for 2007; 31,121 individuals for 2008 and 32,539 individuals for 2009. For the specific aim and methodology of our study, the cross-sectional samples are modified in a way to comprise only those individuals who are between 15-64 years of age and are currently employed, and for whom information on employment status and social security registration status are available. This selection leaves 13,016 individuals doe 2006; 13,458 individuals for 2007; 13,956 individuals for 2008; and 14,375 individuals for 2009.[6]

In the following analysis, we identify three different definitions of labor informality which are adopted to be consistent with the international guidelines provided by ILO, comparable with other countries' studies and inclusive for a comprehensive analysis. Specifically, informal employment under each definition comprises of:

Definition A: The sum of employers and employees in small firms (which in the SILC data set corresponds to firms with less than 10 workers), and self-employment in the forms of either own-account workers (excluding administrative, professional and technical workers) or unpaid family workers.

Definition B: The first definition is modified to incorporate informal employment in the formal sector by removing those workers who are not registered at the social security institute, from the formal sector defined according to Definition A and putting them into the informal sector.

Definition C: Those workers who are not registered at the social security institute regardless of whether they work in the formal or informal sector.

[6] For analyses on non-agricultural employment, the sample further reduces to 8,412 individuals for 2006; 8,774 individuals for 2007; 9,575 individuals for 2008; and 9,771 individuals for 2009.

Along these lines, Definition A basically corresponds to *enterprise* or *productive* definitions which describes informality with *employment in the informal sector*, where informal sector refers to small firms and self-employment. In similar vein, formality is ascribed to employment in large firms. In this method, informality is identified based on the characteristics of the enterprise rather than the worker. Informality measure is constructed using the employment category and firm size questions in the SILC questionnaire. Then, in conformity with ILO's new definition of employment that comprises both *employment in the informal sector* and *informal employment*, Definition B extends the first definition by incorporating social security aspect of employment. This is done by re-classifying those workers who work in formal sector (based on the first definition) but do not have social security as informal, and those who work in informal sector but have social protection as formal. Finally, Definition C is built so as to represent the *legalistic* or *social security* approach. In particular, individual informality is determined at the level of social security protection, in other words whether or not registered at the social security institute. In the SILC survey, this corresponds to the question whether the respondent is registered to the social security or not for his main job.

The empirical analysis consists of two parts. First, we analyze and compare these three definitions in multiple dimensions, including age, gender, education, economic sector, geographical region, establishment size and employment status. The analysis is descriptive in nature, with an aim to determine the degree of congruence between alternative definitions and decompose the structure of labor informality in Turkey. Moreover, a large time span is adopted to trace the transformation dynamics over time, and detect any likely effect of the recent global economic crisis in the late 2008 on the structure of Turkish labor market.

However, the descriptive analysis is limited in the sense that it takes into account of only one variable at a time, thereby ignores the fact that many variables indeed act together when determining informality (Yu, 2012, p. 20). To be more concrete, a multivariate probit regression will be run to investigate the marginal effects of several

variables on the likelihood of informality under each definition. The regression specification will include age, gender, educational attainment, geographical location, economic sector, marital status, number of dependents in the family, household head or not, and firm size as independent variables. The dependent variable base group in each probit regression is formal employment status according to the definition in question. The independent variable reference group is defined as those male, age 15-24, primary school graduate, single, not household head, do not have children, work in manufacturing sector, work as a professional, employed in a small size firm and reside in a rural area. The objective is to further investigate the propensity of being informal by demographic, employment and household characteristics controlling for other relevant factors.

3.4. Characterization of Informality in the Turkish Labor Market

In this section, we present a preliminary characterization of the Turkish labor market over the four-year period 2006-2009, with a particular focus on informal employment based on the three definitions of informality described in the previous section. More specifically, we first assess the extent of which informality prevails and varies across different definitions and time, and then examine its nature using individual socio-demographic, household and employment attributes. The objective is to characterize the labor informality patterns in detail and compare applicability and implications of different measures which are commonly used in the literature in the context of the Turkish labor market.

Table 3.1 reports the sample proportions of workers classified as informal under each definition over the four years. Note that all following analyses are conducted for total and non-agricultural employments separately in order to detach the likely effects of highly informal agriculture sector on the dynamics of labor informality. Looking at the figures, one first notes that share of informal employment in total employent is highest when defined according to definition B and lowest when defined according to

definition C. Specifically, informality rate is found to be approximately 65 percent for definition B, 57 percent for definition A and between 45 to 52 percent for definition C. Regarding the variation in time, informal employment rates based on definitions A and B remain more or less the same over the period in question, whereas social security based informality rate exhibits a readily discernible decreasing trend over time from 2006 to 2009. For the non-agricultural sample, the most noticeable finding is the 10-15 percent fall in the informality rates based on all three definitions. This result clearly confirms that agriculture is a highly informal sector by its nature, hence exacerbates the overall informality figures to a considerable extent.

When data is subdivided by gender, similar results seem to apply except for the fact that female workers demonstrate a remarkably higher level of informality regardless of the definition used. Results are reported in Tables 3.2 and 3.3 for male and female subsamples, respectively. Turning first to the male workers, definition B continues to yield the largest informality rate at between 60 to 64 percent, and definition C the lowest at between 37 to 45 percent. For the male sample, not only definition C but also definition B exhibit a time pattern which decreases from 2006 to 2008, then reverses upwards in 2009. This finding may be interpreted as reflection of the impact of the 2008-2009 global economic crisis on the Turkish labor market.[7] When agriculture is excluded from the sample, male informality exhibits a fall at around 7-8 percent, but its overall pattern does not change at all. As for female workers, the picture somewhat alters in a way that the variation in female informality across different definitions is significantly lower compared to that of male. Furthermore, informality rate under each definition is notably larger for female workers compared to that of both overall and male samples, reaching levels over 70 percent. Another remarkable pattern in female informality can be observed when non-agricultural employment is considered. More specifically, the decline in informality is steepest for female workers when agriculture is excluded, amounting to approximately 20 percentage points. Also interesting is the finding that, the degree of congruence

[7] For a comprehensive analysis of the impact of global crisis on Turkish employment, see Ercan (2010).

between definitions A and C is highest for the female subsample, except for the last year. Put differently, productive and social security measures overlap to a remarkable extent when female workers are considered. The increased discrepancy between these two definitions in 2009 is most likely due to economic crisis.

A breakdown of informality by age is given in Table 3.4. The first thing to notice is the somewhat U-shaped relationship between informality and age. In other words, share of those who are informally employed is higher for the elderly and the young compared to the middle-aged workers. For the 15-24 age group, definition B provides the highest informality rate at between 69 to 76 percent. Whereas, in contrast to the overall picture, for this groups of workers informality is lowest when defined according to definition A. This finding well conforms to the conventional wisdom which postulates that young workers are often initially employed without social security registration and gradually become covered by social protection as they gain experience. One also notes that definition C based informality displays the largest variation over time, starting from as high as 67 percent in 2006 and gradually falling to 55 percent in 2008, then increasing again by 5 percentage points in 2009. Workers in 25-34 and 35-44 age groups are observed to exhibit quite similar informality patterns under all definitions and years. In particular, the proportion of workers defined as informal is highest under definition B and lowest under definition C. An interesting finding is that these two groups appear to experience only minor falls or no change in informality rate for 2009. That result may be interpreted as middle age workers being the least affected from the economic crisis. Also note that the discrepancy between definition C based informality rate and others is largest for these workers. This finding is a mere reflection of the fact that social security registration reaches its highest level for middle age workers, thereby confirming the mainstream literature. Moving forward to workers of age between 45 to 54, informality rate records a more than 10 percentage points rise under all three definitions, else being almost identical with prior evidence. Informality rate is estimated at around 80-90 percent for the oldest group of workers. They are significantly more likely to work in

informal enterprises (i.e. firms with less than 10 workers, own-account or unpaid family work) when considering definition A, and also more prone to working as unregistered at the social security institute when definition C is applied. Overall, the results imply three main points for further investigation. First, young workers are found as significantly more informal under the social security definition compared to productive definition in contrast to all other age groups. Second, middle age workers exhibit the highest level of social protection coverage and lowest level of variation in informality over time. Also interesting is the result that workers of age group 55-64 suffer a severe level of informality regardless of the definition applied. This finding is most likely the result of generous pension schemes causing an epidemic of early retirement, after which elder individuals often move into informal types of employment.[8] Regarding the non-agricultural sample, almost identical informality patterns can be observed, the only difference being a 10-20 percent fall in the proportion of informal employment for all definitions and years in question.

In Table 3.5, one first notes that informality is strongly negatively associated with education level regardless of the measurement criteria used. Starting from as high as over 90 percent for the illiterates, informality rate falls progressively by each increased level of educational attainment. Illiterates are almost exclusively informal and all definitions coincide to a significant extent. When agriculture is excluded, the steepest fall in illiterate informality rate is that of definition A at approximately 30 percent, which reflects the weightiness of the illiterate workers working as unpaid family workers in agriculture sector. As Ercan (2010, p. 81) reports the median education level of the Turkish labor force is primary education. In conformity with

[8] Until 1992, Turkish pension system stipulated a minimum retirement age threshold of 60 for males and 55 for females, and a minimum premium payment equivalent to 5000 days of work. Law No.3774, which was passed in February 1992, pledged a minimum period of social security system attachment for 25 years for males and 20 for females (World Bank, 2006). In 1999, the minimum age thresholds were reinstated at 60 for male and 58 for female, and minimum premium payment requirement was increased to 7000 days of work. With the latest reforms which came into force in October 2008, benefit entitlements and incentives for early retirement were reduced to a large extent. In particular, retirement age is increased from 60 and 58 for men and women, respectively, to 65 for both, and the number of mimimum contribution days are increased from 7000 to 7200 (OECD, 2009). However, these stipulations will be phased in gradually and become effective for age cohorts born after 1980.

their low level of human capital, this group of workers seem to suffer significantly from informality. Definition A, based on enterprise and employment specific attributes, provides the largest estimate of the share of informal employment at around 77 percent. Whereas, definition C based on social security status yields a considerably lower rate at around 58 percent. For the secondary school graduates, informal employment rates and their variation across different definitions are qualitatively similar, but only quantitatively lower. Turning to workers with high school or above level of education, informal employment is found to fall sharply under each definition. This trend is most pronounced for definition C, which shows that informality stands at only between 27 to 31 percent among high school graduates. Similarly, informal vocational school graduates are only around 20 percent; and university graduates are only about 10 percent informal according to definition C. Regarding high-skilled workers in non-agricultural employment, we find a larger coincidence of informality figures under all definitions, that are mostly visible for university graduates. Also noteworthy is the finding that there is only a minor variation in informality rate over time, when workers with high school or above education are considered. This evidence is consistent with the basic premise which views informality as mostly a low-skill phenomenon. Given that the impact of economic crisis on informal employment is most detectable under definition C, one can easily observe from definition C based informality figures that proportion of informal employment among primary and secondary school graduates increase by around 4 percent in 2009, whereas it stays put for high school or above graduates.

Table 3.6 details the proportions of workers classified as informal under each definition broken down into employment status. Regular employees are by far the least informal under each definition compared to all others. Informality rate among regular employees peaks at between 36 to 41 percent under definition B and displays a plunge at around 20 percent under definition C. Also interesting is to see that the ratio of informally employed according to definition C in the sample of regular employees decreases significantly from 2006 to 2008, reaching a level of as low as 17

percent. When comparing the enterprise and social security definitions of informality, namely definitions A and C, one sees a substantial overlap for the regular employees. The results are almost identical for the non-agricultural sample both qualitatively and quantitatively, implying that regular employees are only rarely or never employed in agriculture. However, the picture almost completely changes when casual employees are considered. First and contrary to what is common, definition C based informality is significantly higher than definition A based informality, and noticeably closer to definition B based rate. This finding reveals that casual employees are on average working in informal enterprises, i.e. small firms, but their most differential characteristics is being employed without social security. Casual employees display significant increases in the share of informality for the year 2009 regardless of whichever definition is applied, which implies these workers being severely affected from the crisis. When agriculture is excluded, figures remain more or less the same, indicating that casual employees constitute only a marginal fraction of agricultural employment. Turning to employers, one first notes that they are almost exclusively informal at around 90 percent according to definitions A and B, but only between 25 to 38 percent informal under definition C of social security coverage. This can be explained by the genesis of the definition criteria used in the analysis. That is, employers are classified as informal if working in a firm with less 10 workers under definitions A and B. Thus, the evidence suggests that most employers are associated with small-scale operations in the Turkish economy. Definition C based informality, however, reveals a different reality of the Turkish labor market which points to high levels of self-registration of the employers at the social security institute. Moreover, time variation of informality based on definition C is quite remarkable, decreasing from as high as 38 percent in 2006 to 25 percent in 2008. This finding may be either a reflection of state's planned and insistent fight against informality that was put into action starting with the EU accession negotiations or overall well performance of the

Turkish economy during the years in question.[9] Non-agricultural rates of informal employment are almost identical to that of entire sample, suggesting that employers exist mostly in sectors outside agriculture. As for the most noticeable difference between total and non-agricultural samples figures, own-account workers display the highest standing at approximately 10 percent under all definitions. In regards to other patterns observed for own-account workers, one finds that proportion of informal workers in own-account status is lowest when defined according to social security registration. Moreover, the level of definition C based informality records a steep fall from 2006 to 2008, and re-rises by four points in 2009. Again, this patterns reflects that social security based informality being the most responsive measure to time and economic crisis. Regarding the unpaid family workers, our analysis confirms the basic premise that these workers are almost exclusively employed as informal and in agriculture sector. In addition, one can also note that the degree of coincidence between three measures is substantially high, indicating that regardless of whichever definition is used unpaid family work is an informal phenomenon.

A further breakdown of informality by sector of economic activity elucidates several noteworthy patterns. For evident reasons, the analysis is conducted using only the entire sample for all four years. As Table 3.7 depicts, agricultural employment based on definitions A and/or B turns out to be entirely informal, whereas definition C implies that 10 percent of these workers are indeed covered by social security, hence classified as formal. On the other hand, the share of informal work is considerably low in mining, utilities, finances, public administration, education and health sectors. Moreover, estimates of the size of informality under three definitions are more or less

[9] The government of Turkey has been pursuing a combat against informality since the opening of accession negotiations with European Union in October 2005. In particular, a comprehensive action plan "The Struggle Against Informal Employment" (KADİM) has been launched under the aegis of Ministry of Labour and Social Security. The project was initially focused on informal employment of illegal foreign employees (Ben Salem et al., 2011). More recently, the Government has incorporated fight against informality strategy as a separate section into its Annual Programs. A broader programme, namely "Struggle Against the Informal Economy Action Plan", was out into action under the leadership of Revenue Administration among various other institutions in 2009. The comprehensive and resolute Plan indetifies three main targets (i) promoting formal activities; (ii) strengthening audit capacity and increasing the deterrence of sanctions; (iii) establishing and strengthening institutional and societal consensus (World Bank, 2010).

similar for these sectors. This finding, in particular, articulates the intrinsic formal nature of these sectors. Indeed, these sectors have been mostly operated by the state and have only recently been privatized, though not fully. Since SILC data set does not cover any information whether a work/worker is either public or private, we are not able to distinguish the informality proneness along this divide. However, as results clearly point out, sectoral differences indeed reveal to a significant extent the concomitant dynamics of informality along public/private employment dimension. These sectors are both associated with large-scale formal enterprises and membership to social security. Likewise, manufacturing workers display a lower rate than the average level of informality, though with a size larger than above mentioned sectors. Definition B, as usual, provides the largest estimate of informality and definition A the lowest. The rate of social security coverage appears to be quite high in the manufacturing sector, as depicted by definition C. Moreover, informality rate based on social security status decreases gradually by 10 percent from 2006 to 2009, which points to fastened formalization in the sector over the recent years. None of the three definitions displays any notable change in the informality rate for 2009 compared to the previous years, thereby one might argue that manufacturing was not affected from the crisis at all. Turning to the construction sector, informality appears to be highest at between 75 to 83 percent according to definition B. Social security based informal employment rate, though initially higher than that provided by definition A, decreases gradually over time and reaches a level of 56 percent in 2009. This figure is 8 percent lower than the estimate of definition A. Given the continuously changing dynamic nature of informality, one may prefer definition C to measure informal employment for construction workers, as productive measure appears to be quite non-responsive to time variation. A final informality pattern by employment status can be observed when trade, hotels and restaurants and transportation sectors are considered. Namely, these sectors exhibit a more or less equal distribution of formal and informal employment shares. However, the degree of overlap between three definitions is quite limited. More specifically, definition B estimates a level of informality around 70 percent; whereas definition A measures informality rate to be around 60 percent. In

addition, definition C provides the lowest estimate of informality share which follows a decreasing trend from 2006 to 2008, though records a slight increase in 2009. Regarding the relationship between economic crisis and informal employment, common assumption postulates that during an economic crisis, informal employment would expand as those workers who lose jobs in the formal sector are often displaced in informal sector (Ercan, 2010). However, as Ercan has shown, this was not the case in the recent global crisis since "it was primarily the informal economy workers who lost their jobs". The sectoral breakdown of informality rates based on social security definition in Table 3.7 confirms this argument to some extent. In manufacturing sector, one sees that the share of informal employment increased but only slightly by one percentage point from 2008 to 2009. Relatively larger increases can be observed for mining from 18 to 24 percent, transportation from 38 to 43 percent, others from 56 to 62 percent. For construction sector, which is mostly informal by its nature, we see a fall in informal employment from 2008 to 2009 indicating that informal job losses were disproportionately higher. Finally, the rise in agricultural informality proves that those who lost jobs during the crisis moved back to agricultural sector which helped recovery in overall employment situation (Ercan, 2010).

Lastly, we examine the rate of informality across different occupations, which vary considerably according to the definition. By construction, those self-employed who work as a legislator, professional or technician are classified as informal under definitions A and B. However, there are differences in the estimates of informal employment shares for each according to the definition used as illustrated in Table 3.8. Specifically, the share of informal employment is highest for legislators among these three occupations regardless of the definition criteria used, whereas professionals and technicians display lower though virtually similar patterns of informality. Social security based informality is lowest for the professionals and marks a fall from 11 percent in 2006 to only 5 percent in 2007. One can observe the same trend of time variation in definition C based informality rate for the legislators and technicians, too. That is, the most discernible time variation in informality is

obtained when definition C is used. Turning to service workers, one notes that proportion of workers classified as informal under each of the three definitions is notably higher than that of legislators, professionals and technicians. Service workers' informality rate follows a decreasing trend over time when defined according to definition C; but is rather stable for the other two definitions. Put differently, definition C is again observed to be the most responsive measure to time effects. The degree of overlap between definitions A and B is quite remarkable for the service workers, but this does not apply to social security definition. Skilled agricultural workers, as expected, appear as entirely informal according to definitions A and B, defined based on enterprise and job characteristics. Though to a lesser extent, social security measure also displays informality levels at almost 90 percent among this group of workers. The patterns for craftsmen and elementary operations workers are on average, both qualitatively and quantitatively similar. That is, the share of informally employed workers are larger than those formally employed in these occupations. However, the most noticeable finding for these workers is the gradually decreasing trend of informality rate over time, which can be detected under both definitions A and C. The share of informal workers in these two occupations increase by 2-3 percent in 2009 under all definitions.

3.5. Multivariate Analysis of Labor Informality

The descriptive analysis provides an extensive preliminary vision of how certain individual and employment characteristics are correlated with the likelihood of being an informal worker based on three different definitions of informality, the degree of coincidence or discrepancy across these three definitions along key dimensions of employment. However, this practice falls short of explaining any conditional association, namely the marginal effects of potential factors on the likelihood of informality. In order to address this issue, we rely on multivariate analysis and estimate probit regressions of the probability of being informal on a set of individual

and job attributes that are well established in the literature as potential determinants of informality.

A simple probit model specifies the probability of observing an individual *i* being in state 1 as:

$$\Pr\ (y_i = 1) = \Phi\ (x_i'\beta) \tag{3.1}$$

where Φ is the standard normal cumulative distribution function, β is the coefficients vector to be estimated, and x_i are the case-specific regressors of individual *i*. The dependent variable y_i in each regression is assigned a value of "1" if the individual is classified as informal according to the definition in question; and "0" otherwise. The explanatory variables x_i include demographic characteristics of the individual (gender, age, education level), household type (marital status, household head status, existence of children in the household), employment characteristics (occupation, sector of economic activity, experience) and a dummy indicating whether individual resides in an urban or rural area.[10] A comprehensive table of variable definitions is provided in Appendix (Table A.1).

The vector of coefficients β is straightforward to estimate by the maximum likelihood estimation (MLE) method using the following log-likelihood function:

$$\ln L\ (\beta) = \sum_{i=0}^{N} y_i \ln \Phi(x_i'\beta) + (1 - y_i)\ \ln \Phi(1 - x_i'\beta) \tag{3.2}$$

However, for probit models, β coefficients are seldom used for inference, instead marginal effects of the covariates are used. The marginal effect of a change in one of the independent variable *k* on the probability of being in state 1 is formulated as:

[10] Urban areas are those settlements that have populations equal to or above 20001, and rural areas are settlements that have population equal to or below 20000 (TurkStat, 2011).

$$\frac{\partial \Pr\ (y_i = 1)}{\partial x_k} = \frac{\partial\ \Phi(x_i'\beta)}{\partial x_k} = \beta_k \Phi(x_i'\beta) \tag{3.3}$$

The probit analysis is conducted separately for each of the three definitions in order to detect any possible variation or overlap in the results. For presentational brevity purposes, however, we will mainly discuss the probit results for definition A based on job characteristics and definition C based on social security status, since definition B is somewhat a combination of these two edge measures. First, we present and elaborate on the estimation results of the probit model based on definition A, then consider the definition C based probit regression.[11] Our motivation is twofold: characterizing labor informality in Turkey along multiple dimensions in a profound way and pinpointing the differences between these measures of informality that are found notable and indicative.

The probit regression results for definition A, as reported in Table 3.9, provide some valuable insight into observed patterns of informal employment. For this particular case, coefficient estimates represent the impact of explanatory variables on the probability of being informal based on definition A. In this framework, gender turns out to have almost no statistically significant explanatory power, though displaying a positive sign throughout the period in question. Although the positive coefficients are in line with the conventional theory which presumes that informality is positively correlated with being female, they are not statistically significant. This evidence points to a weakness of definition A, namely being unable to capture such a well-established association between gender and informality status. The marginal effect of being female is only slightly significant for 2009, that is women are significantly

[11] Since Definition B is somewhat a combination of Definition A and C, we prefer not to dicuss its probit results in detail for presentational brevity purposes. Nevermore, the probit regression results pertaining to Definition B are reported in Table 3.10. A quick glance shows that probit estimation results for definition B reveal patterns of relationships highly similar to that of definition C. Namely, propensity of being informal according to definition B displays a statistically significant and positive relationship with being female, young, illiterate and/or having no degree, working in agriculture, construction and/or transportation, being a service worker, technician, skilled agricultural worker, craftsmen, plant operator and/or elementary operations worker and working in small size firms. Hence, discussion of the estimation results for definition C can be taken as also applying to definition B to a large extent.

more likely than men to be informal. This finding may be an implication of the economic crisis. As Ercan (2010, p. 83) reports women's informal self-employment considerably increased during the crisis, most probably because they had to step in the labor market in order to substitute for their husbands who lost jobs, which is called as the "added worker effect" in the literature.

Regarding age, the evidence suggests that workers aged 25-44 and 45-64 are both significantly less likely to be informal according to definition A, compared to the reference category of aged 15-24. Moreover, the negative relationship becomes more pronounced for the eldest workers, reaching a level of almost 50 percentage points. This evidence confirms the well-known stylized fact that young and less experienced workers are more prone to working informally as they often suffer from barriers to entry into formal employment opportunities. The picture somewhat changes when we consider the year 2009. Namely, the sign of the middle age dummy reverses and turns out as significantly positive, whereas older age dummy ceases to be statistically significant. This finding can be interpreted as middle age workers being affected disproportionately higher than the young during the crisis. The possible reasons are twofold. First, job losses in formal sector could be higher for middle age workers. Moreover, they might be more eager for and successful in finding re-employment in informal sector in case of a lay-off, whereas young workers may not be so and either become unemployed or move out of labor force.

Turning to education, we find that the coefficient estimates contradict the basic premises of the established theory on the association between schooling and being informal. More specifically, the reference category of primary school graduates are found to have significantly lower probability of being informal under definition A compared to workers with any higher level of educational attainment. Furthermore, the coefficient for illiterates or no degree turn out negative, albeit being only slightly significant. This evidence pinpoints to another drawback of definition A, namely eliding to identify one of the most prominent stylized facts related to informality.

Household demographic structure seems to play almost no role in explaining definition A based informal employment. Specifically, marginal effects of being married and/or being a household head are found as positive but not statistically significant. The only exception is the statistically significant *married* dummy for 2009, which implies that those married individuals became more likely to be informal in the aftermath of the crisis. Whereas having children in the household exhibits a negative relationship with being informal based on definition A, albeit being only marginally significant in 2008. Along these lines, one can confidently tell that definition A also fails to notice any potential influence of household characteristics on the likelihood of being informal.

Sector of economic activity plays somewhat a fair role in explaining the probability of being informal, though seems to overlook some of the well-established premises. Compared to the base category of manufacturing workers, workers in trade, hotels and restaurants, finances, health and other services sectors are found to display a significantly lower probability of being informal based on definition A. These patterns are persistent throughout the period in question, though the magnitudes and significance of coefficients, hence their explanatory power decrease to a notable extent for the year 2009. On the other hand, definition A fails to capture the prominent relationships of informality with agriculture and construction activities.

Occupation emerges as virtually the most significant and powerful determinant of the probability of being informal according to definition A. In particular, workers in all occupations other than legislators and technicians display a significantly higher probability of being informal when compared to the reference group of professional workers. Moreover, these coefficients are not only statistically significant but also remarkably high in magnitude. However, we prefer to approach these evidence with skepticism, since definition A by its construction employs occupational criteria when classifying workers as formal and/or informal. In particular, it peculiarly excludes self-employment in the forms administrative, professional and technical work from

informal employment. Therefore, results should rather be viewed as only a statistical outcome, without adhering a strong qualitative meaning. Similar findings and interpretations may also apply to the firm size variable, which is also used as an explicit criterion in definition A to identify informal workers. Regarding firm size, probit regression coefficient estimates yield ambiguous results, which is due to firm size being used as the measurement criteria in Definition A. Thus, we prefer not to treat them as meaningful for this particular case. Overall, definition A in practice falls short of explaining the well-established association between informality and factors such as occupation and firm size, since that it rather uses these relationships as measurement criteria in its very definition.

For urban/rural divide, definition A reveals a statistically significant pattern. In particular, workers residing in urban areas are found as significantly more likely to be informal between 2006 and 2008 than rural residents. Whereas, the coefficient of urban dummy ceases to be significant in 2009, which is most probably attributable to the impact of the economic crisis. As Ercan (2010, p. 96) well articulates one of the most important factors that helped recovery in employment was the increase in agriculture and "job losers have gone back to their villages to weather the crisis". Ercan states that urban informal job holders are the ones who were affected most during the crisis. When head of the household lost jobs, families returned to their villages in the rural, and started to work as unpaid family workers there. This argument clearly explains the coefficient of urban dummy ceasing to be statistically significantly positive any more in 2009, as rural informality have indeed expanded considerably in the aftermath of the economic crisis.

Turning to the probit estimation results for definition C, reported in Table 3.11, one first notes gender now emerging as a powerful and robust predictor of the likelihood of being informal. In particular, women are approximately 40-50 percentage points more likely than men to work informally, *ceteris paribus.* The highly significant and positive coefficient is well consistent with the renowned stylized fact that female

workers are typically disproportionately represented in formal employment than their male counterparts, even given equal qualifications. This may be due to involuntary or voluntary factors. First, women often face higher entry barriers into formal work opportunities, thereby have no choice but become informal. Whereas, they might also voluntarily opt out of formal employment which is often subject to stricter working conditions and regulations, given their reproductive role and traditional gender division of labor in the Turkish family structure. To this extent, one can confidently argue that definition C based on social security status is superior compared to definition A based on job characteristics, since it can properly capture the gender dimension of labor informality.

Regarding age, there are some pronounced differences when one uses definition C to identify informal workers rather than definition A. First, workers aged 25-44 exhibit a significantly lower likelihood of being informal than the reference group of aged 15-24 workers. This evidence is robust over time and identified for both definitions A and C, and indeed conforms to the mainstream literature which associates informality with young and inexperienced workers. However, workers of age between 45-64 appear no less likely to be informal than those between 15-24. Its coefficient ceases to be statistically significant when definition C based informality is considered. This finding contradicts that of definition A of informality, which exhibits a statistically significant negative coefficient for 45-64 dummy, though only significant at the 5 percent confidence level for 2006 and 2008.

As for the education level and in line with the conventional wisdom, definition C based probit results reveal a strong schooling pattern. In particular, compared to the base category of primary school graduates those with higher schooling exhibit a significantly lower probability of being informal, whereas those who are illiterate or have no degree have approximately 50 percentage points higher probability of working informally. Moreover, one can also note that the magnitude of difference in the probability of being informal rises incrementally for each additional level of

educational attainment. Another noteworthy pattern is that the evidence applies to all years under study. This finding is of great importance since it pinpoints an important disparity between the two main definitions. Education variable when used for explaining any relationship with informality based on definition A, appears to yield ambiguous results which contradict the established theory, whereas it confirms all the expected patterns with informality when described by definition C.

A similar picture emerges for the household characteristics variables, which are now statistically significantly related to definition C based informality. More specifically, marginal effect of marriage on probability of being informal is strongly significantly negative for all years in question. That is, married workers are approximately 20 percentage points less likely to be informal compared to those who are not married. This might reflect that married individuals are less willing to take risks associated with informal employment, and prefer safer employment in formal sector. Due to similar reasons, being a household head statistically significantly reduces the likelihood of informal employment, around 20 percentage points. Turning to children variable, one notes statistically significant but this time positive coefficients, though there exist some variation in its size and significance level over time. The evidence suggests that individuals in households with children posit a higher likelihood of informality. This finding may be interpreted as increased household financial burden making individuals more likely to consent with informal jobs since formal sector jobs are often limited and have higher entry barriers. The evidence on household variables, overall, demonstrate the traditional family influences such as increased family responsibility and increased dependence on safe employment on individual employment decisions. Therefore, one would typically expect a proper definition of informality to identify such household effects in an accurate fashion. In this regard, definition C appears to be superior over definition A once again, as the latter fails to detect these associations.

Informal status defined on the basis of social security registration displays an almost completely different relationship with sector of economic activity, compared to that of based on definition A. Agriculture now emerges as a strong predictor of being informal, namely agricultural workers display statistically positive association with being informal which remain so until the end of the period in question. Whereas definition A based informality fails to identify this prominent stylized fact on sectoral informality. Indeed starting with the mainstream literature, informality has been viewed as mostly a rural agricultural phenomenon which is also a salient feature of Turkish labor markets. Another notable result pertains to the construction workers who are now 70-80 percentage points more likely to be informal compared to their counterparts in manufacturing for all years. This finding, albeit was unidentified by definition A of informality, strictly conforms to a stylized fact of the labor markets in Turkey, where construction workers are mostly those casual day-laborers and account for a major fraction of informal employment. There are also some other notable differences between definitions A and C regarding the sectoral effects on informality. However, the positive association between informality and sectors of agriculture and construction are relatively more established in the literature.

Regarding the firm size, those workers who are not registered at the social security are significantly more likely to be employed in small firms with less than 10 workers. More specifically, workers in firms with 11 to 49 employees are associated with an approximately 70-80 percentage points lower likelihood of being informal. When firm size is even larger, the magnitude of the coefficient increases and reaches a level of almost 150 percentage points.

When compared to the same coefficient in the analysis for definition A of informality, the evidence on rural/urban variable also appears to be entirely different. More specifically, definition C specifies a negative relationship between probability of being informal and urban, which is statistically significant for only 2008 and 2009.

Whereas, definition A reveals a positive relationship between informality and urban residence, which turns out as statistically significant for all years except for 2009.

3.6. Concluding Remarks

Informal employment has always been at the center of theory and policy debate in terms of its importance, determinants and policy implications. Considering its high levels of prevalence and persistence, informality is expected to influence developing country labor markets in many ways and for many years to come, therefore it requires special attention and proactive approach. In order to effectively address its nature and dynamics, however, one first needs a profound understanding of the concept and its dimensions. Data limitations and its intrinsic heterogeneity have rendered measuring informal employment a challenge. There exist numerous attempts in the literature to identify informality. The resulting vast array of methodologies should not be seen only as an obstacle but at the same time as a tool to comprehend its many different facets. Along these lines, this chapter aims to propose a comprehensive and holistic conceptual framework that can be used as a well-grounded initial step to detailed analysis of informal employment in the Turkish labor market.

For this purpose, we employ a novel, individual level micro data set drawn from the 2006-2009 Income and Living Conditions Survey which subsumes a rich set of information on individual, household and job characteristics; labor market state and income. In particular, we construct three alternative definitions of labor informality following the theoretical and applied research. Definition A mostly corresponds to employment in the informal sector, hence the *productive definition* which associates informality with activities of small-scale enterprises and self-employed; definition C represents the *legalistic view* which identifies informality with lack of social security, and definition B is constructed so as to combine both employment in the informal sector and lack of social security. In this framework, we examine the extent of their association using several key individual and job-related characteristics. As a by-

product, this analysis enables a thorough and multidimensional characterization of informal employment in the Turkish labor market across different specifications and over time. In this regard, we first present a descriptive analysis in which three definitions are analyzed and compared in multiple dimensions including age, gender, education, geographical region, economic sector, occupation etc. For a more prudent analysis of the conditional association of these variables with likelihood of being informal, we next estimate three probit regressions individually for each definition.

Overall, informal employment accounts for approximately 65, 57 and between 45 to 52 percent of the sample when defined based on definitions B, A and C, respectively. For the non-agricultural sample, all figures fall by around 10 percentage points, else being identical. Regarding variation over time, social security based informality displays a more discernible pattern from 2006 to 2009, whereas others remain more or less the same over time. Females are found as significantly more informal under all definitions, and overlap between different definitions is higher for female workers. Moreover, we observe a U-shaped relationship between informality and age which is commonly postulated in the mainstream literature. Furthermore, in conformity with the conventional wisdom, informality is found as significantly negatively associated with educational attainment level regardless of the measurement criteria used. A breakdown of informality by sector of economic activity and occupation also marks several evident patterns.

The probit analysis provides a more profound characterization of informal employment in the Turkish labor market both along different definitions and over time. The results, overall, point towards social security based informality definition being superior over productive definition in capturing the association between key individual and job characteristics and informality. More specifically, gender, age, education, household demographics, sector and firm size variables are all found as confirming the well-established stylized facts when informality is identified based on definition C. Whereas, productive measure of informal employment appears to fall

short of properly detecting renowned basic premises in the theory, even in some cases not detecting them at all.

To conclude, this study provides a very comprehensive and detailed diagnosis of the Turkish labor market. Most importantly, the empirical analysis reveals that social security registration criterion is the most proper measure of informality in the Turkish labor market given its ability to capture key relationships between several individual and employment characteristics and the likelihood of informality. Moreover, social security definition appears as the most responsive measure with regards to time and impacts of crisis. Along these lines, we recommend researchers and policy-makers use the social security to define labor informality, for more accurate analyses of the Turkish labor markets.

With this comprehensive and profound understanding of informal employment in the Turkish labor market in terms of definition, measurement and dimensions at hand, in Chapters 4 and 5, we perform more detailed micro-level analysis of labor informality to understand its micro dynamics such as the transition probabilities of workers into and out of formal/informal employment and earnings differences between formal and informal workers, respectively.

Table 3.1: Informality Rates for each definition (Total)

	ALL SAMPLE				NON-AGRICULTURAL SAMPLE			
	2006	**2007**	**2008**	**2009**	**2006**	**2007**	**2008**	**2009**
Definition A	0.58	0.57	0.57	0.57	0.45	0.44	0.43	0.44
Definition B	0.67	0.65	0.64	0.64	0.56	0.54	0.52	0.52
Definition C	0.52	0.48	0.45	0.46	0.39	0.35	0.31	0.32

Source : Author's own calculations based on SILC 2006-2009.
Notes : Definition A is the enterprise definition, Definition B is the extended enterprise definition, Definition C is the social security definition.

Table 3.2: Informality Rates for each definition (Male only)

	ALL SAMPLE				NON-AGRICULTURAL SAMPLE			
	2006	**2007**	**2008**	**2009**	**2006**	**2007**	**2008**	**2009**
Definition A	0.54	0.53	0.53	0.54	0.46	0.45	0.45	0.44
Definition B	0.64	0.62	0.60	0.61	0.57	0.55	0.53	0.53
Definition C	0.45	0.42	0.37	0.40	0.38	0.35	0.30	0.32

Source : Author's own calculations based on SILC 2006-2009.
Notes : Definition A is the enterprise definition, Definition B is the extended enterprise definition, Definition C is the social security definition.

Table 3.3: Informality Rates for each definition (Female only)

	ALL SAMPLE				NON-AGRICULTURAL SAMPLE			
	2006	**2007**	**2008**	**2009**	**2006**	**2007**	**2008**	**2009**
Definition A	0.68	0.66	0.65	0.66	0.42	0.39	0.39	0.40
Definition B	0.76	0.73	0.72	0.71	0.53	0.50	0.47	0.48
Definition C	0.69	0.65	0.63	0.62	0.43	0.36	0.33	0.32

Source : Author's own calculations based on SILC 2006-2009.
Notes : Definition A is the enterprise definition, Definition B is the extended enterprise definition, Definition C is the social security definition.

Table 3.4: Informality Rates for each definition by Age

	ALL SAMPLE				NON-AGRICULTURAL SAMPLE			
	2006	**2007**	**2008**	**2009**	**2006**	**2007**	**2008**	**2009**
Age 15-24								
Definition A	0.60	0.59	0.59	0.61	0.50	0.48	0.48	0.49
Definition B	0.76	0.72	0.69	0.73	0.68	0.63	0.60	0.63
Definition C	0.67	0.61	0.55	0.60	0.57	0.50	0.42	0.46
Age 25-34								
Definition A	0.51	0.50	0.49	0.50	0.42	0.41	0.40	0.41
Definition B	0.58	0.56	0.54	0.55	0.49	0.47	0.45	0.46
Definition C	0.41	0.36	0.33	0.34	0.31	0.26	0.22	0.23
Age 35-44								
Definition A	0.56	0.54	0.54	0.53	0.44	0.42	0.42	0.42
Definition B	0.63	0.60	0.59	0.58	0.52	0.50	0.48	0.47
Definition C	0.43	0.40	0.37	0.37	0.31	0.28	0.25	0.25
Age 45-54								
Definition A	0.65	0.65	0.64	0.63	0.47	0.47	0.46	0.44
Definition B	0.74	0.74	0.73	0.72	0.60	0.59	0.58	0.57
Definition C	0.59	0.57	0.55	0.57	0.45	0.42	0.39	0.41
Age 55-64								
Definition A	0.82	0.80	0.81	0.82	0.59	0.56	0.60	0.56
Definition B	0.93	0.92	0.90	0.90	0.83	0.81	0.79	0.77
Definition C	0.85	0.82	0.80	0.81	0.73	0.71	0.67	0.65

Source : Author's own calculations based on SILC 2006-2009.
Notes : Definition A is the enterprise definition, Definition B is the extended enterprise definition, Definition C is the social security definition.

Table 3.5: Informality Rates for each definition by Education

	ALL SAMPLE				NON-AGRICULTURAL SAMPLE			
	2006	**2007**	**2008**	**2009**	**2006**	**2007**	**2008**	**2009**
Illiterate								
Definition A	0.91	0.89	0.91	0.91	0.65	0.62	0.69	0.65
Definition B	0.98	0.96	0.97	0.98	0.90	0.81	0.86	0.90
Definition C	0.95	0.92	0.94	0.95	0.83	0.73	0.81	0.83
No Grade								
Definition A	0.76	0.77	0.76	0.76	0.53	0.57	0.54	0.53
Definition B	0.91	0.93	0.91	0.91	0.81	0.86	0.82	0.81
Definition C	0.85	0.86	0.84	0.85	0.72	0.77	0.72	0.72
Primary								
Definition A	0.70	0.68	0.68	0.70	0.55	0.53	0.54	0.55
Definition B	0.77	0.77	0.75	0.77	0.65	0.65	0.63	0.65
Definition C	0.58	0.59	0.54	0.58	0.44	0.45	0.40	0.44
Secondary								
Definition A	0.62	0.58	0.58	0.62	0.53	0.49	0.49	0.53
Definition B	0.71	0.68	0.68	0.71	0.64	0.61	0.61	0.64
Definition C	0.53	0.52	0.48	0.53	0.43	0.44	0.39	0.43
High								
Definition A	0.44	0.45	0.46	0.44	0.40	0.41	0.41	0.40
Definition B	0.52	0.53	0.52	0.52	0.48	0.49	0.47	0.48
Definition C	0.28	0.31	0.27	0.28	0.23	0.27	0.22	0.23
Vocational								
Definition A	0.39	0.41	0.38	0.39	0.35	0.37	0.34	0.35
Definition B	0.43	0.45	0.41	0.43	0.39	0.42	0.38	0.39
Definition C	0.23	0.24	0.20	0.23	0.18	0.21	0.17	0.18
University								
Definition A	0.22	0.24	0.21	0.22	0.21	0.23	0.20	0.21
Definition B	0.26	0.29	0.24	0.26	0.25	0.28	0.23	0.25
Definition C	0.09	0.11	0.08	0.09	0.07	0.10	0.07	0.07

Source : Author's own calculations based on SILC 2006-2009.
Notes : Definition A is the enterprise definition, Definition B is the extended enterprise definition, Definition C is the social security definition.

Table 3.6: Informality Rates for each definition by Employment Status

	ALL SAMPLE				NON-AGRICULTURAL SAMPLE			
	2006	**2007**	**2008**	**2009**	**2006**	**2007**	**2008**	**2009**
Regular employee								
Definition A	0.32	0.32	0.30	0.31	0.31	0.31	0.30	0.31
Definition B	0.41	0.39	0.36	0.37	0.41	0.38	0.36	0.37
Definition C	0.26	0.22	0.17	0.18	0.26	0.21	0.17	0.18
Casual employee								
Definition A	0.80	0.75	0.75	0.78	0.82	0.76	0.77	0.80
Definition B	0.97	0.96	0.94	0.96	0.96	0.95	0.93	0.95
Definition C	0.94	0.92	0.85	0.91	0.93	0.90	0.83	0.89
Employer								
Definition A	0.88	0.87	0.88	0.87	0.88	0.87	0.88	0.87
Definition B	0.92	0.90	0.90	0.90	0.92	0.89	0.89	0.89
Definition C	0.38	0.30	0.25	0.27	0.35	0.26	0.22	0.23
Own-account worker								
Definition A	0.79	0.77	0.78	0.78	0.56	0.54	0.56	0.57
Definition B	0.90	0.89	0.89	0.88	0.79	0.77	0.77	0.78
Definition C	0.72	0.68	0.64	0.68	0.62	0.57	0.53	0.58
Unpaid family worker								
Definition A	0.99	0.99	0.99	0.99	0.91	0.94	0.95	0.95
Definition B	1.00	1.00	1.00	1.00	0.97	0.98	0.98	0.98
Definition C	0.94	0.93	0.93	0.95	0.81	0.79	0.77	0.82

Source : Author's own calculations based on SILC 2006-2009.
Notes : Definition A is the enterprise definition, Definition B is the extended enterprise definition, Definition C is the social security definition.

Table 3.7: Informality Rates for each definition by Sector

	ALL SAMPLE			
	2006	**2007**	**2008**	**2009**
Agriculture				
Definition A	0.97	0.97	0.96	0.97
Definition B	0.99	0.99	0.99	0.99
Definition C	0.90	0.89	0.87	0.89
Mining				
Definition A	0.16	0.20	0.19	0.21
Definition B	0.20	0.29	0.26	0.31
Definition C	0.14	0.23	0.18	0.24
Manufacturing				
Definition A	0.33	0.32	0.33	0.33
Definition B	0.47	0.43	0.42	0.42
Definition C	0.35	0.29	0.25	0.26
Utilities				
Definition A	0.03	0.04	0.07	0.06
Definition B	0.04	0.05	0.09	0.10
Definition C	0.01	0.01	0.02	0.04
Construction				
Definition A	0.66	0.65	0.65	0.64
Definition B	0.83	0.80	0.76	0.75
Definition C	0.72	0.67	0.58	0.56
Trade				
Definition A	0.64	0.63	0.61	0.61
Definition B	0.76	0.74	0.71	0.71
Definition C	0.47	0.43	0.35	0.37
Hotels&Restaurants				
Definition A	0.59	0.54	0.55	0.55
Definition B	0.70	0.67	0.67	0.68
Definition C	0.48	0.45	0.44	0.45

Table 3.7 (continued): Informality Rates for each definition by Sector

Transportation					
	Definition A	0.59	0.56	0.55	0.56
	Definition B	0.70	0.65	0.62	0.64
	Definition C	0.49	0.43	0.38	0.43
Finances					
	Definition A	0.22	0.21	0.22	0.20
	Definition B	0.26	0.22	0.24	0.24
	Definition C	0.09	0.06	0.09	0.09
Business services					
	Definition A	0.37	0.37	0.37	0.35
	Definition B	0.50	0.47	0.43	0.42
	Definition C	0.28	0.25	0.19	0.20
Public Administration					
	Definition A	0.08	0.11	0.10	0.11
	Definition B	0.11	0.15	0.14	0.15
	Definition C	0.05	0.08	0.08	0.08
Education					
	Definition A	0.07	0.09	0.07	0.10
	Definition B	0.13	0.16	0.11	0.15
	Definition C	0.07	0.08	0.06	0.07
Health					
	Definition A	0.15	0.15	0.12	0.12
	Definition B	0.21	0.20	0.14	0.15
	Definition C	0.10	0.09	0.05	0.07
Others					
	Definition A	0.78	0.74	0.74	0.78
	Definition B	0.87	0.82	0.83	0.85
	Definition C	0.64	0.55	0.56	0.62

Source : Author's own calculations based on SILC 2006-2009.
Notes : Definition A is the enterprise definition, Definition B is the extended enterprise definition, Definition C is the social security definition.

Table 3.8: Informality Rates for each definition by Occupation

	ALL SAMPLE			
	2006	**2007**	**2008**	**2009**
Legislators				
Definition A	0.42	0.36	0.37	0.35
Definition B	0.63	0.56	0.56	0.55
Definition C	0.36	0.31	0.29	0.30
Professionals				
Definition A	0.20	0.20	0.17	0.17
Definition B	0.27	0.27	0.21	0.22
Definition C	0.11	0.09	0.05	0.07
Technicians				
Definition A	0.24	0.27	0.25	0.22
Definition B	0.34	0.35	0.33	0.31
Definition C	0.20	0.15	0.14	0.14
Clerks				
Definition A	0.26	0.29	0.30	0.32
Definition B	0.33	0.33	0.32	0.35
Definition C	0.18	0.16	0.12	0.14
Service workers				
Definition A	0.64	0.64	0.62	0.63
Definition B	0.69	0.70	0.68	0.68
Definition C	0.48	0.45	0.39	0.42
Skilled Agriculture				
Definition A	0.99	0.99	0.99	0.99
Definition B	0.99	1.00	1.00	0.99
Definition C	0.88	0.88	0.87	0.88
Craftsmen				
Definition A	0.62	0.60	0.59	0.62
Definition B	0.73	0.70	0.67	0.70
Definition C	0.56	0.51	0.43	0.45
Plant Operators				
Definition A	0.35	0.37	0.38	0.39
Definition B	0.51	0.47	0.45	0.48
Definition C	0.38	0.31	0.26	0.31
Elementary Operations				
Definition A	0.57	0.51	0.52	0.55
Definition B	0.69	0.64	0.65	0.66
Definition C	0.60	0.54	0.54	0.57

Source : Author's own calculations based on SILC 2006-2009.
Notes : Definition A is the enterprise definition, Definition B is the extended enterprise definition, Definition C is the social security definition.

Table 3.9: Probit estimation results (Definition A)

	ALL SAMPLE				NON-AGRICULTURAL SAMPLE			
	2006	**2007**	**2008**	**2009**	**2006**	**2007**	**2008**	**2009**
Gender								
female	0.207	0.189	0.169	0.224*	0.168	0.189	-0.169	-0.224*
Age								
age25to44	-0.334*	-0.139	-0.315*	0.251*	-0.381*	-0.139	0.315*	-0.251*
age45to64	-0.520*	-0.365	-0.523*	0.27	-0.542*	-0.365	0.523*	-0.27
Schooling								
illiterate	-0.342	-0.742	-0.131	-0.366*	-0.871	-0.742	0.131	0.366*
noschool	-0.5	-0.252	-0.565*	-0.177	-0.523	-0.252	0.565*	0.177
secondary	0.505***	0.328**	0.0722	0.14	0.540***	0.328**	-0.0722	-0.14
high	0.457***	0.414***	0.282*	0.290**	0.492***	0.414***	-0.282*	-0.290**
vocational	0.671***	0.727***	0.380**	0.256*	0.689***	0.727***	-0.380**	-0.256*
university	0.771***	0.919***	0.427**	0.450***	0.792***	0.919***	-0.427**	-0.450***
Household type								
married	0.0905	5.967	0.135	1.905***	0.0845	5.967	-0.135	-1.905***
hhead	0.093	0.107	0.117	0.125	0.162	0.107	-0.117	-0.125
child	-0.0131	0.00327	-0.201*	0.0456	-0.0123	0.00327	0.201*	-0.0456
Experience								
exper	0.0192	0.000137	-0.0225	-0.0842	0.0125	0.000137	0.0225	0.0842
expersq	-0.000316	-0.0035	0.000457	-0.0187	-0.000177	-0.0035	-0.000457	0.0187
Sector								
Agriculture	0.57	0.000137	0.369	0.000395		0.000137	-0.369	-0.000395
Mining	-3.464	0.466	-0.253	0.737**	-3.5	0.466	0.253	-0.737**
Energy	-0.653	0.49	0.336	-0.793	-0.239	0.49	-0.336	0.793
Construction	-0.513	0.475	0.0546	0.661*	-0.507	0.475	-0.0546	-0.661*
Trade	-1.406***	0.0109	-0.980***	-0.0769	-1.393***	0.0109	0.980***	0.0769
Hotels	-0.704**	-1.080***	-0.469**	-0.348**	-0.660**	-1.080***	0.469**	0.348**
Transportation	0.161	-0.217	-0.18	-0.129	0.174	-0.217	0.18	0.129
Finances	-1.690***	-0.473*	-1.242***	-0.229	-1.702***	-0.473*	1.242***	0.229
PublicAdministr	0.341	-1.282***	1.142***	-0.477**	0.600**	-1.282***	-1.142***	0.477**
Education	0.111	1.023***	-0.375	0.488*	0.0961	1.023***	0.375	-0.488*
Health	-1.166***	-0.0368	-1.087***	-0.041	-1.139**	-0.0368	1.087***	0.041
OtherServices	-0.881***	-1.013**	-0.774***	-0.578*	-0.848***	-1.013**	0.774***	0.578*
Occupation								
Legislators	-0.647***	-0.654**	-0.858***	0.179	-0.668***	-0.654**	0.858***	-0.179
Technicians	0.346*	-0.538***	-0.0291	-0.579***	0.345	-0.538***	0.0291	0.579***
Clerks	11.60***	0.396*	11.78***	0.171	12.62***	0.396*	-11.78***	-0.171
ServiceWorkers	6.932	11.81***	6.936***	1.726***	7.581	11.81***	-6.936***	-1.726***
SkilledAgricultu	13.72***	7.183***	14.26	1.736***	6.574	7.183***	-14.26	-1.736***
Craftsmen	11.54***	14.69	12.25***	3.625***	12.54***	14.69	-12.25***	-3.625***
PlantOperators	11.43***	12.17***	11.90***	1.967***	12.43	12.17***	-11.90***	-1.967***
ElementaryOper	11.56***	12.44***	11.75***	1.825***	12.84***	12.44***	-11.75***	-1.825***
Firm size								
medium	-15.66***	12.42***	-16.20***	1.423***	-16.64***	12.42***	16.20***	-1.423***
large	-16.66	-16.17***		-4.900***		-16.17***		4.900***
Region								
urban	0.353***	0.327***	0.376***	0.0983	0.423***	0.327***	-0.376***	-0.0983
N	13016	11008	11338	11752	6128	11008	11338	11752

Source : Author's own calculations based on SILC 2006-2009.
Notes : [1]For variable definitions, see Appendix Table A.1. [2]The results are marginal effects for the Probit Model. [3]Dependent variable base category: Formal based on definition A. [4]Independent variable base category: Male, age 15-24, primary school graduate, single, not household head, does not have children, manufacturing sector, professional occupation, small size firms, rural. [5]The coefficients imply the marginal effects for the probit model.
Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table 3.10: Probit estimation results (Definition B)

	ALL SAMPLE				NON-AGRICULTURAL SAMPLE			
	2006	**2007**	**2008**	**2009**	**2006**	**2007**	**2008**	**2009**
Gender								
female	0.222**	0.302***	0.320***	0.316***	0.202**	0.302***	0.320***	0.316***
Age								
age25to44	-0.497***	-0.355***	-0.268***	-0.172*	-0.490***	-0.355***	-0.268***	-0.172*
age45to64	-0.187	-0.0899	0.0696	0.183	-0.185	-0.0899	0.0696	0.183
Schooling								
illiterate	0.481*	0.734***	0.631***	0.906***	0.387	0.734***	0.631***	0.906***
noschool	0.540**	0.764***	0.689***	0.776***	0.593***	0.764***	0.689***	0.776***
secondary	-0.0479	0.0864	0.0341	0.0733	-0.0494	0.0864	0.0341	0.0733
high	-0.191*	-0.0983	-0.149*	-0.0771	-0.163*	-0.0983	-0.149*	-0.0771
vocational	-0.278***	-0.199**	-0.302***	-0.217**	-0.273***	-0.199**	-0.302***	-0.217**
university	-0.0299	0.214*	0.025	-0.0391	-0.0205	0.214*	0.025	-0.0391
Household type								
married	-0.183*	-0.142*	-0.176*	-0.160*	-0.193*	-0.142*	-0.176*	-0.160*
hhead	-0.0153	-0.074	0.0844	0.0105	-0.00683	-0.074	0.0844	0.0105
child	0.101	0.235***	0.191***	0.168**	0.0933	0.235***	0.191***	0.168**
Experience								
exper	-0.0211*	-0.0113	-0.0368***	-0.0353***	-0.0211*	-0.0113	-0.0368***	-0.0353***
expersq	0.000768**	0.000712**	0.00116***	0.00117***	0.000803**	0.000712**	0.00116***	0.00117***
Sector								
Agriculture	1.319***	1.590***	1.519***	1.402***		1.590***	1.519***	1.402***
Mining	-0.558	0.0468	-0.0756	0.127	-0.555	0.0468	-0.0756	0.127
Energy	-0.799**	-0.534	-0.696*	-0.32	-0.814**	-0.534	-0.696*	-0.32
Construction	0.587***	0.761***	0.661***	0.552***	0.589***	0.761***	0.661***	0.552***
Trade	-0.404***	-0.154*	-0.354***	-0.0766	-0.398***	-0.154*	-0.354***	-0.0766
Hotels	-0.208	0.186	0.0285	0.158	-0.191	0.186	0.0285	0.158
Transportation	0.431***	0.360***	0.397***	0.261*	0.421***	0.360***	0.397***	0.261*
Finances	-0.529***	-0.272**	-0.579***	-0.167	-0.524***	-0.272**	-0.579***	-0.167
PublicAdministr	-0.518***	-0.104	-0.0843	-0.0942	-0.514***	-0.104	-0.0843	-0.0942
Education	-0.279	0.114	-0.113	-0.0737	-0.269	0.114	-0.113	-0.0737
Health	-0.549***	-0.239	-0.526**	-0.446**	-0.537***	-0.239	-0.526**	-0.446**
OtherServices	0.105	0.333**	0.427**	0.749***	0.119	0.333**	0.427**	0.749***
Occupation								
Legislators	-0.582***	-0.201	-0.546***	-0.305**	-0.587***	-0.201	-0.546***	-0.305**
Technicians	0.284*	0.589***	0.488**	0.461***	0.283*	0.589***	0.488**	0.461***
Clerks	0.431**	0.736***	0.548***	0.694***	0.435**	0.736***	0.548***	0.694***
ServiceWorkers	0.896***	1.485***	1.339***	1.223***	0.899***	1.485***	1.339***	1.223***
SkilledAgricultu	0.776**	1.240***	0.639*	0.899***	0.613	1.240***	0.639*	0.899***
Craftsmen	0.952***	1.532***	1.259***	1.301***	0.961***	1.532***	1.259***	1.301***
PlantOperators	0.846***	1.261***	1.009***	1.101***	0.867***	1.261***	1.009***	1.101***
ElementaryOper	0.871***	1.346***	1.230***	1.079***	0.859***	1.346***	1.230***	1.079***
Firm size								
medium	-2.965***	-2.890***	-3.294***	-2.771***	-2.963***	-2.890***	-3.294***	-2.771***
large	-3.785***	-3.708***	-3.974***	-3.595***	-3.771***	-3.708***	-3.974***	-3.595***
Region								
urban	0.115*	0.0716	-0.101*	-0.138**	0.139**	0.0716	-0.101*	-0.138**
N	13016	13457	13950	14368	8412	13457	13950	14368

Source : Author's own calculations based on SILC 2006-2009.
Notes : [1]For variable definitions, see Appendix Table A.1. [2]The results are marginal effects for the Probit Model. [3]Dependent variable base category: Formal based on definition B. [4]Independent variable base category: Male, age 15-24, primary school graduate, single, not household head, does not have children, manufacturing sector, professional occupation, small size firms, rural. [5]The coefficients imply the marginal effects for the probit model.
Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table 3.11: Probit estimation results (Definition C)

	ALL SAMPLE				NON-AGRICULTURAL SAMPLE			
	2006	**2007**	**2008**	**2009**	**2006**	**2007**	**2008**	**2009**
Gender								
female	0.452***	0.395***	0.529***	0.433***	0.187***	0.395***	0.529***	0.433***
Age								
age25to44	-0.408***	-0.389***	-0.299***	-0.332***	-0.361***	-0.389***	-0.299***	-0.332***
age45to64	-0.0365	-0.0737	0.0716	0.0941	0.0873	-0.0737	0.0716	0.0941
Schooling								
illiterate	0.620***	0.475***	0.640***	0.551***	0.525***	0.475***	0.640***	0.551***
noschool	0.496***	0.422***	0.476***	0.575***	0.482***	0.422***	0.476***	0.575***
secondary	-0.135**	-0.0865*	-0.0573	-0.0736	-0.162**	-0.0865*	-0.0573	-0.0736
high	-0.384***	-0.342***	-0.342***	-0.376***	-0.402***	-0.342***	-0.342***	-0.376***
vocational	-0.520***	-0.466***	-0.442***	-0.445***	-0.565***	-0.466***	-0.442***	-0.445***
university	-0.444***	-0.467***	-0.534***	-0.639***	-0.455***	-0.467***	-0.534***	-0.639***
Household type								
married	-0.212***	-0.194***	-0.271***	-0.248***	-0.224***	-0.194***	-0.271***	-0.248***
hhead	-0.194***	-0.195***	-0.160***	-0.194***	-0.0999	-0.195***	-0.160***	-0.194***
child	0.0842*	0.164***	0.188***	0.107**	0.0325	0.164***	0.188***	0.107**
Experience								
exper	-0.0204***	-0.00741	-0.0154**	-0.0166**	-0.0413***	-0.00741	-0.0154**	-0.0166**
expersq	0.000488***	0.000277*	0.000472***	0.000491***	0.00107***	0.000277*	0.000472***	0.000491***
Sector								
Agriculture	1.194***	1.341***	0.976***	1.254***		1.341***	0.976***	1.254***
Mining	-0.236	0.22	0.177	0.467**	-0.261	0.22	0.177	0.467**
Energy	-0.794*	-0.734	-0.775	-0.366	-0.889**	-0.734	-0.775	-0.366
Construction	0.753***	0.832***	0.727***	0.665***	0.706***	0.832***	0.727***	0.665***
Trade	-0.0168	0.119*	0.0619	0.077	-0.0513	0.119*	0.0619	0.077
Hotels	0.0839	0.310***	0.341***	0.418***	0.0495	0.310***	0.341***	0.418***
Transportation	0.338***	0.462***	0.500***	0.494***	0.270***	0.462***	0.500***	0.494***
Finances	-0.0903	0.0387	-0.0517	0.0394	-0.121	0.0387	-0.0517	0.0394
PublicAdmin.	-0.478***	-0.0123	0.0913	0.0583	-0.554***	-0.0123	0.0913	0.0583
Education	-0.366**	-0.107	-0.189	-0.247*	-0.326*	-0.107	-0.189	-0.247*
Health	-0.571***	-0.193	-0.537***	-0.402**	-0.485***	-0.193	-0.537***	-0.402**
OtherServices	0.286***	0.331***	0.448***	0.602***	0.258**	0.331***	0.448***	0.602***
Occupation								
Legislators	0.308**	0.462***	0.474***	0.510***	0.252*	0.462***	0.474***	0.510***
Technicians	0.218	0.275*	0.399***	0.349**	0.238*	0.275*	0.399***	0.349**
Clerks	0.0435	0.0734	-0.0183	0.151	0.149	0.0734	-0.0183	0.151
ServiceWork	0.601***	0.757***	0.651***	0.718***	0.627***	0.757***	0.651***	0.718***
SkilledAgricul.	0.0353	0.159	0.481***	0.293*	0.389	0.159	0.481***	0.293*
Craftsmen	0.687***	0.847***	0.768***	0.876***	0.673***	0.847***	0.768***	0.876***
PlantOperator	0.553***	0.597***	0.523***	0.676***	0.556***	0.597***	0.523***	0.676***
ElementaryOp	0.678***	0.832***	0.893***	0.874***	0.661***	0.832***	0.893***	0.874***
Firm size								
medium	-0.799***	-0.705***	-0.751***	-0.770***	-0.802***	-0.705***	-0.751***	-0.770***
large	-1.548***	-1.457***	-1.405***	-1.555***	-1.528***	-1.457***	-1.405***	-1.555***
Region								
urban	-0.0465	-0.0641	-0.110***	-0.157***	0.0142	-0.0641	-0.110***	-0.157***
N	13016	13457	13950	14368	8412	13457	13950	14368

Source : Author's own calculations based on SILC 2006-2009.
Notes : [1]For variable definitions, see Appendix Table A.1. [2]The results are marginal effects for the Probit Model. [3]Dependent variable base category: Formal based on definition C. [4]Independent variable base category: Male, age 15-24, primary school graduate, single, not household head, does not have children, manufacturing sector, professional occupation, small size firms, rural. [5]The coefficients imply the marginal effects for the probit model.
Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table A.1: List of Definitions

Variable Name	*Definition*
Definition A	
Formal	1 if employee or employer in a firm with more than 10 workers or an administrative, professional or technician
Informal	1 if employee or employer in a firm with less than 10 workers or own account-worker (excluding administrative, professional and technicians) or unpaid family workers; 0 otherwise
Definition B	
Formal	1 if employee or employer in a firm with more than 10 workers or an administrative, professional or technician and who are registered to the social security institute; 0 otherwise
Informal	1 if employee or employer in a firm with less than 10 workers or own account-worker (excluding administrative, professional and technicians) or unpaid family workers and those who are categorized as formal in Definition A but is not registered to SSI; 0 otherwise
Definition C	
Formal	1 if registered to the social security institute for main job; 0 otherwise.
Informal	1 if not registered to the social security institute for main job; 0 otherwise.
Individual Characteristics	
male	1 if male; 0 otherwise
female	1 if female; 0 otherwise
age15to24	1 if in age range; 0 otherwise
age25to44	1 if in age range; 0 otherwise
age45to64	1 if in age range; 0 otherwise
iIlliterate	1 if illiterate; 0 otherwise
noschool	1 if did not attend school; 0 otherwise
primary	1 if completed primary school; 0 otherwise
secondary	1 if completed secondary school; 0 otherwise
high	1 if completed high school; 0 otherwise
vocational	1 if completed vocational school; 0 otherwise
university	1 if completed university; 0 otherwise
Household Characteristics	
single	1 if not married; 0 otherwise
married	1 if married; 0 otherwise
nochild	1 if the household do not have any children; 0 otherwise
child	1 if the household has children; 0 otherwise
hhead	1 if head of the household; 0 otherwise
Employment/Job Characteristics	
exper	total number of years the individual has worked for since he/she first started working
expersq	experince squared
Agriculture	1 if employed in agriculture; 0 otherwise
Mining	1 if employed in mining; 0 otherwise
Manufacturing	1 if employed in manufacturing; 0 otherwise
Energy	1 if employed in energy; 0 otherwise
Construction	1 if employed in construction; 0 otherwise
Trade	1 if employed in trade; 0 otherwise
Hotels	1 if employed in hotels; 0 otherwise
Transportation	1 if employed in transportation; 0 otherwise
Finances	1 if employed in finance or business services; 0 otherwise
Public Administration	1 if employed in public administration; 0 otherwise
Education	1 if employed in education; 0 otherwise
Health	1 if employed in health; 0 otherwise
Other	1 if employed in other services; 0 otherwise
Legislators	1 if employed as a legislator; 0 otherwise
Professional	1 if employed as a professional; 0 otherwise
Technicals	1 if employed as a technician; 0 otherwise
Clerks	1 if employed as a clerk; 0 otherwise
Service workers	1 if employed as a service worker; 0 otherwise
Skilled agricultural worke	1 if employed as a skilled agricultural worker; 0 otherwise
Craftsmen	1 if employed as a craftsmen; 0 otherwise
Plant operators	1 if employed as a plant operator; 0 otherwise
Elementary operations	1 if employed as a elemenatry opr. worker; 0 otherwise
small	1 if firm size is between 1 to 10; 0 otherwise
medium	1 if firm size is between 11 to 49; 0 otherwise
large	1 if firm size is 50 or more; 0 otherwise
full-time	1 if emplyed as full-time; 0 otherwise
part-time	1 if employed as part-time; 0 otherwise
urban	1 if individual resides in an urban area; 0 otherwise
rural	1 if individual resides in an rural area; 0 otherwise

CHAPTER 4

LABOR MOBILITY ACROSS THE FORMAL/INFORMAL DIVIDE IN TURKEY

4.1. Introduction

Informality has long been a salient phenomenon in developing country labor markets, thus has been addressed in several theoretical and empirical studies since the 1950s. In the early literature, most analyses hinged on static and aggregate approaches. Recently, the introduction of advanced panel data sets and techniques empowered more profound and thorough dynamic research. In particular, mobility analysis has become readily available, leading to a paradigm shift in the labor market literature. Namely, it provided the means for investigating the implications of and motivations for workers' transitions into and out of informal employment, examining the determinants of duration and turnover rates in the informal sector and the extent to which and how specific individual and job characteristics influence worker flows. Along these lines, mobility analysis illuminated the abstract informality phenomenon to a remarkable extent.

In this chapter, we aim to expand the literature by implementing the mobility analysis to the Turkish labor market with a specific emphasis on informality. Turkey, given its economic and demographic dynamics, provides rich evidence for a growing, heterogeneous and multifaceted informal labor market (Tansel, 1997, 1999, 2001; Bulutay and Tasti, 2004; Ozdemir et al., 2004; DPT, 2009; Kenar, 2009; Aydin et al., 2010; World Bank, 2010). However, existing evidence on labor informality in Turkey is mixed and scant. Data limitations and conceptual obscurity have hindered detailed

analyses. Along these lines, the aim is to provide a diagnosis of dynamic worker flows across distinct labor market states and identify the effects of certain characteristics (i.e. age, gender, education, work experience, economic activity sector, household demographics, etc.) on variant mobility patterns. To the best of our knowledge, this study is the first to undertake a labor mobility analysis in the context of the formal/informal employment divide in Turkey.

In this regard, we first develop and discuss a set of probability statistics based on annual worker transitions across distinct employment states utilizing Markov transition processes. As Bosch and Maloney (2007, p. 3) claim: "labor status mobility can be assumed as a process in which changes in the states occur randomly through time and probabilities of moves between particular states are governed by Markov transition matrices". Towards this end, we compute the transition probabilities of individuals moving across six different labor market states using the novel Income and Living Conditions Survey (SILC) panel data for 2006, 2007, 2008 and 2009. Indeed, the panel feature of SILC allows us to trace the same individuals in the working age population between 2006 and 2009. In this framework, we start by computing the transition probabilities separately for two, three and four year transitions pertaining to the 2006 to 2007, 2006 to 2008 and 2006 to 2009 transitions; and for total and non-agricultural samples. In line with the recent literature, we define six labor market states as formal-salaried (FS), informal-salaried (IS), informal self-employed (ISE), formal self-employed (FSE), unemployed (U), and inactive (N). This categorization facilitates investigating various possible transitions into and out of informal employment. In particular, disentangling the formal/informal divide further into salaried/self-employed subgroups provides the means for assessing the extent to which and how informality prevails in different forms. Moreover, including unemployed and inactive categories, we are able to provide a more comprehensive labor market analysis, as informal employment displays substantial transitivity into/out of these non-employment states.

We find evidence that mobility patterns are fairly similar across different time spans. Moreover, the probability of remaining in initial state is higher than the probability of transition into another state for all the labor market states, except for unemployment. All together, these findings depict that the Turkish labor market has a relatively static nature. Regarding the direction and degree of outflows, we note that there is only very limited mobility into the formal-salaried state. This evidence is suggestive of the entry barriers to and/or preference for formal-salaried employment, thereby confirming the traditional segmentation theory of formal and informal labor markets. Another noteworthy pattern pertains to informal self-employed who display only minimal mobility into salaried employment. This finding is of great importance since it reveals the nature of informal self-employment in Turkey. When combined with transition statistics for the non-agricultural sample, this evidence implies that informal self-employment is mostly an agricultural and female phenomenon, thus differs from that in Brazil, Mexico and Argentina, where it often prevails in the form of voluntary entrepreneurial activities (Bosch and Maloney, 2010).

The transition analysis, however, is mostly descriptive in nature and falls short of explaining the underlying dynamics of observed transitions. In order to examine the nature of labor mobility patterns in more detail, we estimate six multinomial logit models individually for each labor market state by adopting a number of individual, household and job characteristics as explanatory variables. The results reveal several relationships between the covariates and the likelihood of variant transitions. Particularly, gender, education and economic sector are found as significantly related to mobility tendencies, hence of great importance for designing effective policies to address labor informality in Turkey. To the best of our knowledge, this study offers the first such exclusive analysis in the context of the Turkish labor market.

The remainder of this section is organized as follows; Section 4.2 provides a brief survey of literature on mobility across the formal/informal labor markets. Section 4.3 describes the data. In Section 4.4. we define main variables used in the study and

present a descriptive analysis. Section 4.5 describes the methodology, then discusses the results of the transition analysis. The methodology and results of multinomial logit models are presented in Section 4.6. Finally, Section 4.7 provides a summary of the main findings and implications for policy.

4.2. Literature Survey

As Perry et al. (2007, p. 57) point out: "static summary statistics of the allocation of workers obscure important aspects of the dynamism of worker flows among sectors". The introduction of reliable panel data sets has given rise to a new set of techniques in the informality literature. Starting with the pioneering work of Maloney (1999), several attempts have been made to model labor mobility using transition matrices constructed from probabilities of actual movements of the same individuals across distinct labor market states, thereby empowering more profound analyses on labor market dynamics.

Maloney (1999), in his seminal work, examines mobility patterns in the Mexican labor market with an aim to test the traditional dualistic theory of formal and informal labor markets. In particular, he considers workers' transition patterns across six sectors of work including formal salaried, informal salaried, self-employed, contract workers, out of labor force and unemployed. The empirical analysis consists of calculating the raw probability of moving from an initial sector to a terminal sector, which is then standardized by the terminal sector size, separation rates from the initial sector and job openings in the terminal sector. The results suggest that the standardized mobility indices (V_{ij}, as he calls them) depict symmetrical flows across all sectors of work and that labor mobility and turnover rates are high. Along these lines, Maloney argues that urban labor markets exhibit an integrated structure, as opposed to a segmented one which typically displays low formal sector turnover rates and unidirectional flows from informal to formal sectors. Then he examines the underlying factors which determine probability of moving from one sector to another,

through a multinomial logit model using experience, schooling and initial real wage as covariates. The results of this exercise also support an integrated labor market structure. In an earlier version of this study, Maloney (1998) analyzes patterns of mobility among sectors using 1987-1991 panel data and finds high levels of mobility in the Mexican labor market. His analysis is based on a transition matrix that enables him to compare a person's job status at a certain point of time with the status that he or she had twelve months earlier. Maloney reports only a little evidence in favor of traditional dualistic theory, and suggests that earnings differentials and mobility patterns show that indeed much of the informal sector is a desirable destination.

Calderon-Madrid (2000) examines transitions for 1993, 1995 and 1997 in Mexico. He identifies six job statuses as formal sector, informal sector, unemployment, out of the labor force, self-employment, paid by commission or percentage, and unpaid jobs. In sum, he finds that the time spent in a job and the so-called four and six-year retention rates are short relative to OECD countries; that between 15 and 20 percent of wage earners in the formal sector move out to another job status in only one quarter and that the figures for other job statuses are much higher; and that the share of each job status within the total did not significantly change, though individual movements among job statuses were quite high. This last feature implies that the spaces left by the flow of persons out of one job status into another one are to a great extent filled by a flow of persons moving in the opposite direction. He next estimates hazard functions, in order to explore the dynamics behind observed transitions. The analyses show that persons with formal education spend less time compared to those without formal education in informal employment and self-employment. The hazard function analysis also reveals that the median time spent by workers in the formal sector is 3.5 times of the median time spent by those in the informal sector.

Gong et al. (2004) explore labor mobility in five urban cities of Mexico using two separate five-wave panels over the period 1992-1995. The purpose is to identify the mobility patterns and underlying dynamics associated with individual characteristics

and business cycles. They also question whether the transitional evidence supports a traditional view which considers informal work as the disadvantaged sector. Gong et al. first calculate quarterly transition matrices for flows between non-employment, informal-sector employment and formal-sector employment. They find probability of transitions between non-employment and informal sectors to be higher than that between non-employment and formal sectors. Moreover, the probability of remaining in the formal sector is found to be significantly higher than in the informal sector. Then, a reduced form dynamic multinomial panel logit model with random effects is run to examine the influence of one's age, education, gender, previous labor market state, region ethnicity and other factors. Results show a positive relationship between education and formal sector employment, a negative (positive) relation between the income of other family members and informal sector employment (non-employment). Overall, Gong et al. find evidence in favor of the traditional theory where informal sector is inferior, a temporary queuing device before transition into formal work and entry and exit rates of formal employment are relatively low.

Duryea et al. (2006) provide a mobility analysis of nine countries including Albania, Georgia, Hungary, Poland, Russia, Ukraine, Argentina, Mexico and Venezuela. Informality is defined based on the social security definition, and contract status in countries where data is lacking. Conditional annual probabilities of moving from an initial sector *i* to another sector *j* are calculated for each of the six labor market states to form the transitional matrices. The evidence indicates that unemployment is more persistent in transition countries, formal sector jobs have a higher duration than informal sector jobs, and transition into unemployment is higher from the informal sector compared to that from the formal sector. Furthermore, mobility within salaried employment states (i.e. formal-salaried and informal-salaried) exceeds that between salaried employment and self-employment.

Krstić and Sanfey (2007) examine labor mobility in Bosnia and Herzegovina (BH), employing panel data from 2001 and 2004 Living Standard Measurement Study.

They consider a wider range of labor market states: informal employees, informal self-employed, farmers on own farm and unpaid family workers to form the informal employment. Formal wage employees and formal self-employed make up formal employment, while unemployed and inactives constitute the remaining labor force. By grouping informal and formal employment into one category and using the *Shorrocks index*[12], Krstić and Sanfey first compare the overall mobility level relative to other transition countries and find mobility to be higher in Bosnia-Herzegovina. Next, they decompose formal/informal employment labor flows across wage/self-employment. The main findings are that informal workers who moved into formal employment remained in the same sector; almost all informal employees who became formal workers remained in the same employment type; and that agriculture though being the least mobile sector in fact involved sizable flows between farmers and unpaid family workers. In order to scrutinize the dynamics of these transitions, a probit regression is run to explain the probability of moving from informal to formal employment. They use gender, age and age squared, marital status, completed level of education, resident status and health status, size of household, other household members' employment status, consumption quintiles and location, sector of economic activity and whether the worker remained in the same job as explanatory variables. Education, service sector, residential status, and remaining in the same job are found to have significant explanatory power.

Lehmann and Pignatti (2007) investigate employment flows in Ukraine using a rich data set from 2003-2004 Ukrainian Longitudinal Monitoring Survey (ULMS). They estimate multinomial logit transitions both within and between formal and informal employment statuses. They use several explanatory variables such as gender, age, schooling, tenure, part-time job, voluntary-involuntary job, marital status, number of children and region. The results vary according to the type of transition in question.

[12] The Shorrocks index is proportional to the fraction of individuals who changed their labour market status within a given period. It is calculated as $S = (n - tr(P))/(n -1)$, where n is the number of states and tr(P) is the trace of transition matrix P. S takes the values in the interval $[0, n/n -1]$; $S = 0$ when nobody changed their status and $S = n/n -1$ when everybody changed their status". (Krstić and Sanfey, 2007, p. 318)

Next, they derive transition matrices separately for four and six labor market states following Maloney (1999). That is, they estimate the *P*-matrices of raw transition probabilities, *Q*-matrices of destination sector size standardized probabilities and *V*-matrices of state occupancy duration adjusted *Q*-matrices. Main findings imply that formal employment is the most desirable state for which informal employment and unemployment are queuing stages and that labor market is segmented.

Maloney (1999)' methodology is applied to the Argentinian case by Canavire-Bacarreza and Soria (2007) for the 1998 to 2005 period. Multinomial logit models and conditional probability matrices of labor market transitions are estimated with an aim to test the effects of economic crises on labor mobility. The evidence indicates that individuals with higher levels of schooling on average find it easier to enter into formal employment. Moreover, they tend to adjust their wages and push less educated people out of the market during a crisis, when their probability of finding formal employment drops in relative terms.

Bigsten et al. (2007) study the degree of segmentation and structural dynamics of the Ethiopian labor market between 1994 and 2004. In particular, they trace the evolution of earnings gaps, worker transitions and state dependence in sector choice over time. They consider unemployment, public/private sector employment, formal/informal sector employment and wage/self employment as the labor market states. In addition to computing raw sample transition matrices, Bigsten et al. estimate dynamic binary sector choice models for four labor market states. More specifically, they track the degree of segmentation across different time pairings and estimate probit models for sector choices. However, the analysis is limited to binary techniques and dichotomies. Main findings are that workers' mobility has increased over time, state persistence has decreased and sensitivity to earnings gaps in sector choice has augmented.

With the purpose of assessing whether labor mobility patterns are in line with a traditional labor market view and how they are affected by individual characteristics,

Bernabè and Stampini (2009) analyze quarterly 1998-1999 panel data for Georgia. They consider six labor market states comprising inactivity, unemployment, formal wage employment, informal wage employment, self-employment and farming. All individual transitions, even if observed only once, are pooled in order to build the transitions matrix. In addition to calculating standard transition probability indices, a new statistic for testing labor market segmentation is introduced. The share of temporary mobility, defined as those workers who move to another state at any time but are found in the original state at the final interview relative to workers who made at least one transition, is used to measure the desirability of each status. Overall, the evidence suggests that informal employment is often involuntary and more volatile than formal employment. On the other hand, self-employed workers display both voluntary and subsistence activities. Age, gender, education and urban/rural variables are confirmed to be statistically significant in the mobility patterns. Bernabè and Stampini also contribute to the existing literature by accounting for different macroeconomic conditions and farming activities.

Pagés and Stampini (2009) add to the existing literature on labor market segmentation and mobility in several ways. They provide a comparative analysis of labor mobility patterns for six countries. The sample includes Argentina, Mexico and Venezuela, which have been addressed by several previous researches; and extends to Albania, Georgia and Ukraine which are relatively understudied. Instead of running a dynamic multinomial logit regression, the authors estimate transition matrices separately for skilled and unskilled individuals identified based on their educational level. The main contribution of the paper, however, is a novel benchmark mobility index that complements the standard transition probabilities. The measure accounts for the size and job openings in initial and terminal states, thereby allows the impacts of mobility barriers to be removed and renders all states equally preferred and equally likely to become the destination sector. Pagés and Stampini compare the standard transition matrix to a steady state matrix and a benchmark transition matrix. The evidence purports a high level of mobility between formal-salaried and informal-salaried, but a

low level of mobility between self-employed and formal-salaried. Skill levels are found to be statistically insignificant in affecting mobility patterns.

In a more recent comprehensive study, Bosch and Maloney (2010) use panel data from Argentina, Brazil and Mexico to analyze and compare labor market dynamics. Using continuous time Markov transition processes derived from an underlying discrete time counterpart, they compute transition statistics across five labor market states comprised of unemployed, out of labor force, informal-salaried, formal-salaried and self-employed. These statistics include the raw intensities (Q-statistic) of transitions, the propensities (R-statistic) of transitions conditional on turnover rate, the adjusted propensities (C-statistics) controlling for turnover and job vacancies, a general mobility index and the average duration in each sector. The intensities point out three main patterns. First, duration is highest in formal-salaried and lowest in informal-salaried; and informal-salaried to formal-salaried flows are far higher than the reverse flows. Second, mobility between informal-salaried and self-employed is significantly higher than that between formal-salaried and self-employed. As for the propensities, transition patterns are reversed in some cases, implying a more closer resemblance to an integrated market view. The adjusted propensities display an even further smoothened pattern and fairly symmetrical flows between formal-salaried and self-employed and also between formal-informal salaried employment states. Further disaggregating flows across age and business cycle, Bosch and Maloney report that "a substantial part of the informal sector, particularly the self-employed, corresponds to voluntary entry although informal-salaried work appears to correspond more closely to the standard queuing view, especially for young workers".

4.3. Data

The data used in this analysis is drawn from the Income and Living Conditions Survey (SILC), which has been conducted by the Turkish Statistical Institute (TurkStat) since 2006. The novel, nationally representative, rich, panel nature of the

survey makes it unique and invaluable for the aim and methodology of the study. It provides detailed information on the employment status, social security coverage, working hours, labor and other income, demographic characteristics, living conditions, job characteristics and socioeconomic conditions of the subjects. The survey results have only recently been released in micro data sets, thus to our knowledge have not yet been used in any other studies.

SILC is designed as a rotating panel in which the sample of households and corresponding individuals are traced annually for four consecutive years. Each year the survey is conducted for four subsamples. One subsample is removed and replaced by a new subsample in each year. The samples are selected and assigned survey weights to be representative of non-institutionalized Turkish resident population. A two-stage stratified sampling procedure is used in sample selection. The interviews are administered once every year. The sample size is designed considering possible non-response, thereby no replacement is undertaken. Survey results are published annually in both cross-section and panel data set formats. The analysis below focuses mainly on the years 2006, 2007, 2008 and 2009, since the micro data set for the following years are not yet released. The original cross-sectional samples consist of 30,186 individuals for 2006; 30,263 individuals for 2007; 31,121 individuals for 2008 and 32,539 individuals for 2009. For the specific aim and methodology of the study, panel samples are modified in a way to comprise only the labor force between 15-64 years of age who are present in at least two consecutive years of the survey. That corresponds to 18,343 individuals for 2006-2007; 11,462 individuals for 2006-2008; 5,422 individuals for 2006-2009.

4.4. Definition and Descriptive Analysis of Labor Market States

As regards to defining informality, the first internationally agreed operational definition was adopted in the 15th International Conference of Labor Statisticians (ICLS) in 1993. Informal employment was defined as comprising “all jobs in

informal sector enterprises, or all persons who, during a given reference period, were employed in at least one informal sector enterprise", with informal sector enterprises meaning private unincorporated enterprises, i.e., enterprises that are "not constituted as separate legal entities independently of their owners, and for which no complete accounts are available that would permit a financial separation of the production activities of the enterprise from the other activities of its owner(s)" (Hussmanns, 2005, p. 3). Put differently, informality was ascribed to small-scale enterprises; enterprises operating without a legal status and/or employing unregistered workers; and family enterprises with unpaid family workers and the self-employed (Aydın et al., 2010, p. 3). The ILO definition was later extended to comprise self-employed in informal enterprises (i.e. workers, employer/owner of small firms, own-account workers, unpaid contributing family members); and wage employment in informal jobs (i.e. employees in informal enterprises, casual and domestics workers, industrial outworkers) (Chen, 2007). ILO later extended the informality definition to refer to employment relationships which are not subject to labor legislation, social protection, taxes or employment benefits (Hussmanns, 2005, p. 7). The social security and contract status are by and large the two most common measurement criteria in applied research.

The definitions are adopted to be as consistent as possible to the existing theoretical and empirical literature. SILC questionnaire allows us to distinguish along employed/non-employed, salaried/self-employed, formal/informal divides. Using this feature, we identify six different labor market states: formal-salaried, informal-salaried, formal self-employed, informal self-employed, unemployed and inactive. Employees working for a wage/salary are defined as formal-salaried if they are registered at the social security institution for their main job and informal-salaried if not. Own-account workers and unpaid family workers form the self-employed category, which is divided into formal self-employed if registered at the Social Security Institution and informal self-employed if not. Following Pages and Stampini (2009), unpaid family workers are classified as informal self-employed. Employers

are excluded from the sample, as the number of observations is not sufficient to perform any reasonable analysis. Unemployed comprises individuals who are not working, but actively searching for a job. Lastly, individuals are classified as inactive if they are neither working nor searching for a job. In particular, students, retirees, seasonal workers, old or those unable to work, and domestic workers form the inactive category. By disaggregating the labor force into multiple subcategories, we are able to scrutinize variant patterns of labor mobility defined as worker transitions between distinct labor market states.

The frequencies and shares of each labor market state for 2006, 2007, 2008 and 2009 are reported in Table 4.1. The distribution reveals a stable pattern for all states across the four years under study, except for a notable rise in the share of formal-salaried category. As Table 4.1 illustrates, inactives make up the largest share of total sample, reaching almost 50 percent. The shares of informal self-employed and formal-salaried are similar in 2006 at 18 and 16 percents, respectively. The remaining sample is comprised of informal-salaried at 10 percent, unemployed at 5 percent and formal self-employed at only 3 percent. Informal workers, including both salaried and self-employed, make up a larger fraction than the sum of formal-salaried and formal self-employed workers.

A gender breakdown of distribution analysis is of significant importance in the Turkish labor market. Indeed, the incidence of inactive women still stands as a major virtue of the Turkish labor market, distorting most aggregate labor market figures. Along these lines, Table 4.2 and 4.3 present a breakdown of the labor force into men and women and recalculation of the labor market distribution accordingly. As expected the inactivity rate increases to 70 percent for women and falls to 22 percent for men. That proves the magnitude of inactive women to be a fundamental driving force behind the labor market dynamics. Moreover, sample proportions of all other labor market states are considerably lower for women compared to that of men. As regards to informality, figures also reveal a salient stylized fact of the Turkish labor

market that almost two thirds of those women who are employed are informal, while men exhibit a more or less equal distribution across formal and informal employment. Further decomposition displays that men are mostly employed in salaried work and women in self-employment. It is also noteworthy to mention that women exhibit almost no existence in formal self-employment. In contrast, majority of women are found in informal self-employment, which is a mere reflection of women unpaid family workers in agriculture.

In order to provide an overall picture, labor informality in Turkey is decomposed across time and by a number of demographic and employment related key factors.[13] Table 4.4 details the sample distribution of informality by gender, age, education, marital status, occupation, sector, employment status, firm size, household type and geographical location for 2006 and 2009.[14] The decomposition analysis is conducted separately for total employment and non-agricultural employment with the aim of detaching the effects of agriculture sector being 90 percent informal on the dynamics of labor informality. In this analysis, we define informal employment as those who are employed without being registered to the compulsory Social Security Institution of Turkey (SSI). Following the same vein, formal employment refers to those workers who are registered to SSI. Accordingly, women are approximately 70 percent informal, whereas informality among male labor stands at around 45 percent. The shares of informality for men and women converges at approximately 40 percent if agriculture is excluded. In terms of age, we observe young and elderly to be more informal; in both total and non-agricultural employment. Informality appears to be perfectly negatively related to education level, descending from over 90 percent for none education to around 10 percent for university graduates. Single workers tend to be slightly more informal as opposed to married.

[13] For a more comprehensive decomposition, see Table 4.5 which details the breakdown of each of the six labor market states by multiple variables.

[14] For presentational brevity, Table 4.4 only reports numbers for 2006 and 2009 which correspond to the initial and final years of our data. The numbers for 2007 and 2008 are similar.

The occupational distribution of informality reveals two notable patterns. It follows that professionals, technicians and clerks are to a large extent formal at around 80-90 percent, whereas skilled agricultural, elementary operations and service workers are mostly employed without being registered to the Social Security Institution (SSI).

Another central factor underlying the informality dynamics in the Turkish labor market is sector of economic activity. With regards to sectoral informality, agriculture assumes the lead in terms of informal employment, reaching a level of almost 90 percent throughout the four years. Construction sector also exhibits a considerable rate of informality. On the other hand, mining, utilities, finance, education, health and public administration sectors remain mostly formal at around 80-90 percent. Sectoral informality rates remain more or less similar over the four years, except for the construction sector which displays a 10 percent fall in informality from 2006 to 2009.

Employment status portrays an even more discernible informality pattern. Regular employees are the least informal at around 20 percent, whereas casual employees, own-account workers and unpaid family workers are typically informal. Employers do not have an evident distributional pattern, only slightly more formal. Exclusion of agriculture from the sample does not alter the informality composition significantly, as opposed to what is expected. Casual employees and unpaid family workers are still highly informal, and the fall in informality is confined to about 10 percent.

Firm size reveals a perfectly negative relationship with informality, thereby affirms the theory. Accordingly, employment in small firms is typically informal as opposed to that in larger firms where it is predominantly formal. Excluding agricultural employment, firm size is still negatively related to informality.

Finally, as for the household characteristics, informal employment appears to be more common among non-single households both with/without children.

To sum up, informality is typically associated with those individuals who are female, young and/or old, illiterate and/or none educated, single; work as agricultural and/or construction worker, casual and/or unpaid family worker, in small-size firms and live in rural areas. When agriculture is excluded, formal/informal divide in employment somewhat softens, as most of the above presented informality patterns ceases to be evident. The summary statistics set out the preliminary framework of the informality analysis in the Turkish labor market. The sample is weighted by nationally representative survey weights, and hence characterizes roughly the current aggregate labor market along all dimensions being considered. Furthermore, comparing 2006 and 2009 labor market outlooks, one observes that the labor market in Turkey displays a somewhat increasing formalization across all dimensions under study. In order to further delve into its dynamics, following sections provide transition analysis and multinomial logit estimation.

4.5. Markov Transition Analysis of Worker Flows in the Labor Market

The use of micro-level panel data and multistate stochastic models have led to a paradigm shift in the empirical labor markets literature. In particular, individual labor market transitions between different labor market states have now became traceable through Markov chain models.[15] As Fabrizi and Mussida (2009, p. 236) summarize, Markov chain models enable estimating transition probabilities when subjects are observed only at discrete time points and exact transition dates are not available.

A random process X_t defined over a discrete state space $K = \{1, \dots, K-1\}$ is called a first-order discrete Markov chain if:

$$\Pr\ (X_t = k \mid X_{t-1}, \dots, X_1) = \Pr\ (X_t = k \mid X_{t-1}) \qquad (4.1)$$

[15] For detailed discussion on Markov chain models, see Gourieroux, C. (1989, chapter 5) or the English version translated by Klassen, P. B. (2000, chapter 6).

If X_t is a Markov chain and $j,\ k \in \{K\}$, the conditional probability:

$$p_{kj}(t, t+1) = \Pr\ (X_{t+1} = j \mid X_t = k) \quad \text{for } \forall t \text{ and } j, k \in K \tag{4.2}$$

is called the transition probability of moving from state k to j at time t. If the transition probabilities are independent of time, Markov chain is time-homogenous[16], that is:

$$p_{kj}(t, t+n) = \Pr\ (X_{t+n} = j \mid X_t = k) \quad \text{for } \forall t, n \text{ and } j, k \in K \tag{4.3}$$

Given a finite set of states $K = \{1, \dots, K-1\}$, transition probabilities can be represented in a discrete time transition probability matrix as follows:

$$P = \begin{bmatrix} p_{00} & \cdots & p_{0K} \\ \vdots & \ddots & \vdots \\ p_{K0} & \cdots & p_{KK} \end{bmatrix} \tag{4.4}$$

Along these lines, p_{kj} refers to the probability of finding a worker in state j at the end of the period given that the worker was at state k at the beginning of the period.[17] The P matrix can be estimated by the maximum likelihood estimator for $p_{kj} = \frac{N_{kj}}{N_{k.}}$ where N_{kj} is the number of transitions from state k to j and $N_{k.}$ is the number of transitions out of state k.

For the specific purposes of the study, we identify X_t to denote the labor market state of a given individual at time t. We define the state space K to comprise six labor market states; formal-salaried (FS), informal-salaried (IS), formal self-employed (FSE), informal self-employed (ISE), unemployed (U) and inactive (N).

[16] For further information, see http://www.math.rutgers.edu/courses/338/coursenotes/chapter5.pdf

[17] As Lehmann and Pignatti (2007) state, these estimates are close to the true transition probabilities in the absence of round-tripping.

In the following analysis, we estimate the P-matrix of raw transition probabilities for 2006-2007, 2006-2008 and 2006-2009 flows. That is, we construct three different P-matrices for one, two and three year transitions. In this way, we compare transition tendencies across different time spans, and hence in a sense test for robustness of the results. Furthermore, given the weight of the agriculture sector in the Turkish labor market, transition analysis is conducted separately for both total and non-agricultural employment.

The first thing to notice in Tables 4.6 through 4.8 is that the transition probabilities are more or less similar over the two, three and four year panels. Nevertheless, each case will be discussed below for integrity purposes. Secondly, when agriculture is excluded from the sample, the picture somewhat alters but the changes are limited mostly to informal self-employed and inactive groups. Thirdly, the most discernible transition pattern can be observed along the main diagonal of the probability matrix. By definition, p_{jj} reflects the probability that an individual remains in a given state. As per se, the high levels of p_{jj} imply that majority of the subjects in each category do not move out of their initial labor market state, except for the unemployed.

From 2006 to 2007, one observes that approximately 90 percent of those who are initially formal-salaried remain in their state. This result is well consistent with the traditional segmentation theory which sees labor informality as a survivalist strategy when formal employment opportunities are limited (Yu, 2012, p. 3).[18] Once an individual becomes formal-salaried, he/she is unlikely to leave this state. The almost negligible transitions into other states are typically due to early retirement schemes in Turkey which encourage individuals leave their formal job at an early age, then either move out of labor force or informal employment. When agriculture is excluded, the transition dynamics of the formal-salaried do not alter at all. This finding is a mere reflection of agriculture being almost exclusively an informal sector.

[18] Fields (1975), Mazumdar (1976), Bernabè (2002), Perry et al. (2007)

The informal-salaried workers, who constitute about 10 percent of total employment, demonstrate higher levels of mobility. Approximately 13 percent of those who were employed as informal-salaried in 2006 becomes formal-salaried in 2007. Considering that the reverse transition probability from formal-salaried into informal-salaried employment amounts to only 2.8 percent, the figure is quite illustrative. More specifically, this finding indicates that the flows between formal-salaried and informal-salaried are asymmetrical, hence conforms to the traditional segmentation theory's presumption of one-way flows from informality to formality. Almost 22 percent of informal-salaried move into non-employment, either as unemployed or inactive. Probability of transition from informal-salaried to informal self-employed state is limited at 7 percent. Exclusion of agricultural employment appears to have only trivial effects on the transition patterns of informal self-employed workers. This result proves that agricultural workers do not figure in informal-salaried state.

Formal self-employed workers, who make up only 3.5 percent of the sample, do not reveal a remarkable mobility pattern. The most noticeable flow out of formal self-employment is that into informal self-employment. The underlying dynamics for such a transition tendency will be scrutinized in the next section. For the non-agricultural sample, formal self-employed workers display almost identical transition patterns, the only exception being a fall in the probability of flows into informal self-employment.

Informal self-employment constitutes nearly one fifth of the sample labor market. Outflows are limited to 4 percent into informal-salaried, 4.5 percent into formal self-employed, and 13 percent into non-employment states. Transition to formal-salaried state is almost negligible. Altogether, these figures imply that informal self-employed are usually those disadvantaged in the labor market who face barriers to mobility. As the labor market composition analysis have demonstrated, agricultural employment mostly prevails under informal self-employment. The sample weight of this state falls from nearly 18 percent to 4 percent when agricultural employment is left out. Thus, the most noticeable effect of excluding agriculture from the sample can be observed

on the transition dynamics of this state. In particular, the transition probabilities of flows into all other states double, except for that into inactive state. Put differently, when agricultural workers, who constitute the majority are left out, informal self-employment emerges as a rather active state. Transition probabilities, albeit change in magnitude, do not imply a major change in the outflow pattern of the informal self-employed workers. Likelihood of transiting out are, in decreasing order, into inactive, formal self-employed, informal-salaried, unemployed and formal-salaried states.

Unemployed individuals are visibly the most mobile among all labor market groups. Nevertheless, they display a rather heterogeneous transition pattern. The stayers are limited to only 27.9 percent, whereas flows into formal-salaried state prevail at 15.2 percent, informal employment at 32.4 percent and inactivity at 23.8 percent. In other words, unemployed display the highest probabilities of transition into these states. These findings, overall, are a mere reflection of the heterogeneity within unemployment category. The most discernible inference to be drawn is that for unemployed individuals, probability of transition into informal employment is twice of that into formal employment. It follows that formal employment opportunities are limited and have higher entry barriers. By definition unemployed state is irrelevant to exclusion/inclusion of agriculture, thus transition probabilities are analogous.

Inactives constitute the largest segment of our sample. The almost negligible levels of outflows reflect the rigid nature of inactive state. Reluctance to move of inactives can be explained by several structural characteristics of the Turkish economy and labor market. Two most common of these are discouraged workers and women inactivity. Indeed, the incidence of female inactivity still stands as a major feature of the Turkish labor market and distorts most aggregate labor market figures given that the inactivity rate stands at 70 percent for women, whereas for men it is only 22 percent (see Tables 4.2 and 4.3). When agriculture sector is excluded, sample weight of inactives increase by about 10 percent. However, probabilities of transition into other states are almost identical with the former counterparts.

Considering 2006-2008 panel in Table 4.7, one can easily notice that the transition probabilities remain on average similar. The most notable changes are a rise in the probability of informal-salaried to formal-salaried transitions from 12.9 percent to 24.1 percent; a rise in the probability of formal self-employment to formal-salaried transitions from 3.3 percent to 8.2 percent and a rise in unemployment to formal-salaried transition probability from 15.2 percent to 21.4 percent. Overall, labor market displays somewhat a higher level of mobility. In particular, flows into formal-salaried employment display a significant increase. When time span is further increased to comprise 2006 to 2009 transitions, as Table 4.8 illustrates the picture is also similar. The most discernible change is that transitions into non-employment states, that are unemployment and inactivity, increase significantly. This finding may be indicative of the impact of the economic crisis on the labor market. Another interesting finding is that, among those who move into non-employment, salaried workers tend to move into unemployment, whereas self-employed workers are more likely to move into inactivity. Similar conclusions apply for the non-agricultural sample.

4.6. Multinomial Logit Regression Analysis

Identifying the variables related to the probability of worker flows is of paramount practical and policy-making interest. In order to characterize mobility patterns in more detail, we rely on multinomial logit (MNL) specification to model the labor market transitions. Indeed, MNL model offers a statistically rigorous way to predict the probability of each possible transition as a function of individual characteristics.

Formally, a simple MNL model specifies that:

$$\Pr\left(X_{i,t+n} = j \mid X_{i,t} = k\right) = \frac{\exp\left(Z_i{}'\beta_{j|k}\right)}{\sum_{l=0}^{K}\exp\left(Z_i{}'\beta_{l|k}\right)} \tag{4.5}$$

where Z_i are case-specific regressors for each individual i; $X_{i,t} \in \{0, 1, 2, \dots, K\}$ is the labor market state of individual i at time t. In order for such a MNL model to identifiable, one outcome $k \in K$ is specified as the base or reference group such that $\beta_{k|k} = 0$. Thereafter the parameter vector β is straightforward to estimate by the maximum likelihood estimation (MLE) method. For MNL models, however, β coefficients are seldom used for inference.[19] Instead, marginal effects of the independent variables are computed as[20]:

$$\frac{\partial \Pr\ (X_i = j)}{\partial z_m} = \Pr\ (X_i = j|\ Z) \cdot \left[\beta_m^j - \sum_{l=0}^{K} \beta_m^j \Pr\ (X_i = j|\ Z)\right] \tag{4.6}$$

In this study, we modify the above MNL methodology to be compatible with our specific purposes and comparable to the existing studies on other countries. We estimate six simple multinomial logit regressions for each labor market state of departure, namely formal-salaried, informal-salaried, formal self-employed, informal self-employed, unemployed and inactive.[21] Multinomial logit analysis is conducted for each set of panel individually to check for robustness and variation of the results (i.e. 2006-2007, 2006-2008 and 2006-2009 panels).[22] To this end, dependent variable in each regression conveys a different interpretation. It is defined as a categorical variable which takes the value 0 if the individual maintains his/her labor market state from 2006 to 2007.[23] Whereas for each of the five possible outflows, values from 1 to 5 are assigned. For instance, consider the subsample of individuals who were

[19] As Greene (2002, p. 722) states, the parameters of the multinomial logit model do not have a direct intuitive interpretation in regards to their sign or magnitude. Their use for drawing statistical inference in empirical research is uncommon.

[20] The time subscript (t and n) is omitted for expositional convenience.

[21] Multinomial logit regressions are estimated by Maximum Likelihood Estimation (MLE). The marginal effects are computed at the means of the explanatory variables. All empirical analyses are done with STATA version 10.

[22] Following the same vein as Transition analysis in Section 4.5, we consider transitions for 2006 to 2007, 2006 to 2008 and 2006 to 2009, separately.

[23] For presentation brevity, the variable definitions are given for 2006-2007 panel only. Same definitions apply when 2007 is replaced with 2008 and 2009, for the 2006-2008 and 2006-2009 panels respectively.

employed as formal-salaried in 2006. The dependent variable takes the value 0 if the individual remained as formal-salaried in 2007. If the individual changed state in 2007, the dependent variable assumes values from 1 to 5 for transitions into informal-salaried, formal self-employed, informal self-employed, unemployed and inactive states, respectively. The explanatory variables include demographic characteristics of the individual in 2006 (gender, age, education level, marital status) and employment characteristics of the individual (occupation, sector of economic activity, firm size, work tenure, work tenure squared). A comprehensive list of variable definitions is provided in Appendix (Table A.2.). Note that for the unemployed and inactive individuals, employment characteristics cannot be used as explanatory variables, hence are excluded from the regressions.

The marginal effects of the multinomial logit models for 2006-2007, 2006-2008 and 2006-2009 panels are reported through Tables 4.9, 4.10 and 4.11 respectively. The presentation adopts the standard multinomial logit regression interpretation within the following framework: Marginal effects depict "how the given explanatory variables influence the probability of leaving the initial state for a certain destination state relative to the probability of no outflow" (Bukowski and Lewandowski, 2005, p. 16).

Note that the transition analysis has shown that the evidence does not change on a large scale if agricultural workers are excluded from the sample. The only notable differences in mobility patterns are observed for informal self-employed, since they are mostly found in agriculture sector. As discussed in the previous section, when agricultural workers are removed one finds that both transitions into and out of informal self-employment significantly increases, whereas the probability of remaining in informal self-employment decreases by almost 15 percent. This pattern indicates that agriculture displays a very low level of mobility into other labor market states. In the following analysis, we estimate MNL regressions for the total sample.[24]

[24] For presentational brevity purposes, we estimate MNL regressions only for the total sample but not the non-agricultural sample.

4.6.1. Transitions from Formal-Salaried Employment

MNL results provide significant insight into the observed outflows from the formal-salaried state for the 2006-2007 transitions. For this particular case, coefficient estimates represent the impact of the explanatory variables on the probability of leaving formal-salaried state for a certain destination relative to the probability of remaining. The results are reported in Table 4.9. First thing to notice, gender plays a powerful role in explaining mobility out of the formal-salaried state. In particular, formal-salaried women are significantly less likely than men to become informal-salaried. Likewise, being female reduces the likelihood of transitions into formal self-employment, *ceteris paribus*. Considering the fact that only less than one percent of the women in the sample are formal self-employed (see Table 4.5), the highly significant negative coefficient comes by no surprise. On the contrary, the effect of this variable becomes significantly positive for probability of moving into inactivity. This result is well consistent with our earlier finding that almost 70 percent of sample women are inactive (see Table 4.5). The high level of inactivity among women seems to dominate their mobility patterns. Given the traditional division of gender roles and family responsibility of women in Turkey, women are significantly under-represented in formal employment. Apparently, if and/or once they become formal-salaried, they are more persistent in this state compared to men. Notwithstanding, estimation results indicate statistically significant differences among transition patterns of women of different age groups. Accordingly, formal-salaried women aged 15-24 are less likely than those aged 25-44 to move into informal-salaried and formal self-employed states. It is also noteworthy to mention at this point that the prime working age in Turkey is between 25-44, which corresponds to the age when families are started and children are born. In this context, middle age women tend to have stronger incentives (i.e. household financial needs) for working and/or re-employment in case of a job loss. Along these lines, one can conclude that gender remains as a robust and powerful predictor of transitions out of formal-salaried state.

Regarding age, we find that formal-salaried workers aged 25-44 and/or 45-64 are significantly less likely to become informal-salaried, compared to the base category of workers aged 15-24. This finding may be the reflection of two facts. First, as mentioned by Huitfeldt (1998, p. 24), young individuals have a higher probability of moving out of employment. Second, young and less experienced workers often experience entry barriers to formal-salaried employment. Given that only about seven percent of aged 15-24 are formal-salaried[25], it is no surprise that they are the least likely age group to maintain their state. Another noticeable finding is related to transitions into inactivity. Compared to workers who are formal-salaried in 2006 and belong to 15-24 age group, the probability of dropping out of labor force is lower for 25-44 age group, but higher for 45-64 age group. The interpretation can be twofold. First, young adults are often the first to be affected in case of a layoff. Yet, they are more flexible in remaining inactive compared to middle aged workers who often cannot afford to drop out of labor force. Second, early retirement schemes in Turkey is the most likely reason behind older individuals displaying a higher likelihood of transition into inactivity.

Household demographic structure seems to play only negligible roles in explaining transitions of the formal-salaried workers. The marginal effect of marriage on outflows is only slightly significant for flows into formal self-employment and inactivity states. In particular, married formal-salaried are significantly more likely to become formal self-employed, but less likely to drop out of the labor force compared to the singles. This evidence points to the spouse effect on one's employment choice. As for female-marital status interaction, we find a strongly negative effect of being married and female on outflows into informal-salaried and/or formal self-employed states, and a positive effect on transitions into inactivity. Having/not having children have almost no statistically significant explanatory power for the mobility patterns of formal-salaried workers. Turning to the household size, estimation results indicate a significantly negative relationship only for transitions into formal self-employment

[25] See Table 4.5.

and inactivity. That is, the larger the household size the lower the probability of leaving formal-salaried employment and becoming formal self-employed and/or inactive. Overall, these findings point to the traditional family influence on individual employment decisions due to increased family responsibility, increased dependence on safe employment and higher motivation for re-employment in case of a job loss. Turning to 2006-2008 transitions reported in Table 4.10, marital status becomes insignificant for all outflows, though coefficient signs remain same. The marginal effect of household size appears still significantly negative for outflows into formal self-employment, but becomes insignificant for explaining outflows into inactivity. Estimation results for 2006-2009 transitions in Table 4.11 also do not reveal a remarkable difference. The effect of being married on transitions into inactivity continues to be significantly negative, but that into formal self-employment now becomes positive albeit insignificant. We prefer not to treat the reverse in sign as meaningful, but only as a statistical outcome.

In line with the conventional wisdom, high school and university degree significantly reduce the probabilities of every movement out of formal-salaried. This pattern may be explained as purely result of formal-salaried jobs being intrinsically more stable as argued by Pages and Stampini (2009, p. 398). However, there usually exist other underlying factors. First, as Maloney (1999, p. 292) suggests, the opportunity cost of working informally is often lower for low-skilled individuals, especially for those who usually have only minimal earnings in the formal sector. Second, the risk of being subject to involuntary layoffs is usually lower for better-educated workers. Even in case of a job loss they are on average more likely than less-educated workers to find another formal-salaried job. Moreover, as suggested by Gong et al. (2004, p. 17) “These effects may, however, also be demand-side driven, reflecting different educational requirements in the two sectors, with the formal sector jobs typically requiring more (formal) education than the informal sector jobs”. Taking the evidence on education altogether suggests that labor market transition probabilities are to a great extent determined by prior educational attainment. Considering the estimation

results for the three and four year panels of 2006-2008 and 2006-2009, we find the explanatory power of education as increased. The coefficient of no education dummy becomes significant for transitions into informal self-employment and inactivity for 2006-2008 panel, and those into informal-salaried and unemployment for 2006-2009 panel. In other words, individuals with no education are more persistent in formal-salaried state compared to the primary school graduates. These results appear to contradict the basic premises of established theory. Given that only about one percent of formal-salaried have no education, the coefficients can be regarded as of doubtful validity. The coefficient of secondary school becomes significant for outflows into informal-salaried state if the time span of the panel is increased. This evidence is consistent with earlier arguments that as the level of education rises, one is more likely to remain in formal employment. Formal-salaried workers with secondary school degree are also found to be significantly less likely to become unemployed and/or inactive compared to primary school graduates, which again confirms the basic premises. The influence of higher education exhibits almost identical patterns for three and four year panels, thereby underlining its explanatory power.

The MNL results reveal that experience, measured by total years of employment, does not significantly explain any transition out of formal-salaried state, except for those into inactivity. Accordingly, probability of moving into inactivity relative to remaining in formal-salaried state significantly decreases with work experience. As is well-established in literature, the higher the experience, the lower the effect of negative labor shocks on a worker. Therefore, it is often easier for more experienced workers to maintain labor market state and/or achieve a match between jobs and personal attributes in case of a job loss. Considering 2006-2008 and 2006-2009 transitions out of formal-salaried state, the signs of experience and experience squared, though remain the same, cease to be statistically significant. The only exception is the negative coefficient of experience for transitions into unemployment which becomes significant for 2006-2008 panel. Overall, estimation results indicate that experience may not be a powerful explanatory variable, which can be interpreted

in two ways: First, formal-salaried workers in Turkey are mostly employed in public sector and public jobs often offer life-time employment. If one ever becomes formal-salaried, which usually happens in the initial years of employment, he/she is quite unlikely to exchange it for another type of employment or be subject to layoff. In this regard, experience does not exert a determinate effect on their mobility patterns.

Sector of economic activity plays a fairly significant role in explaining movements out of formal-salaried employment. Compared to base category of industrial workers, services workers are significantly less likely to move into informal-salaried, unemployed and inactive states. In other words, industrial workers display a somewhat stronger persistence in formal-salaried employment relative to services sector workers. The result is coherent with the fact that about 70 percent of industrial workers are indeed formal-salaried. The coefficient of agriculture appears to be significantly negative for all flows out of formal-salaried state. However, considering the share of formal-salaried in agriculture is only less than one percent, we prefer not to make any conclusive statement on this coefficient. Construction is associated with a significantly lower probability of formal-salaried to formal self-employment transition relative to industry sector. Overall, a closer look at the sectoral breakdown of labor market transitions highlights the importance of sector's nature in affecting mobility tendencies, and evinces that some sectors are intrinsically more stable than others. Sector coefficients somewhat alter in terms of either size, magnitude or significance if one considers three and four year panels, namely 2006-2008 and 2006-2009. We will briefly discuss the differences which are found notable and indicative. First, coefficients of agriculture appear to switch signs and become positive for outflows into informal self-employment. Though not strongly significant, this effect seems more consistent with the existing theory and evidence. As reported in Table 4.5, over 80 percent of agricultural workers in our sample are informal self-employed. That being said, one would typically expect the likelihood of transitions from formal-salaried to informal self-employment to be higher for the agricultural workers compared to the industrial workers. A similar result holds for the construction sector

dummy, which exhibits a negative sign for 2006-2007 transition, but becomes significantly positive for 2006-2008 and 2006-2009 outflows into informal-salaried state. Given that approximately 60-70 percent of construction workers are employed as informal-salaried, they are expected to display a higher probability to move into informal-salaried state compared to industry workers. The coefficient of services, though still negative, becomes insignificant for outflows into informal-salaried state when 2006-2008 and 2006-2009 transitions are considered. Given that over 50 percent of services workers and about 70 percent of industry workers are formal-salaried services variable is not expected to have a strong determining effect.

Firm size variable, confirming our priors, offers a powerful tool for understanding transitions out of formal-salaried state. In particular, workers in firms of size 50 or more are strongly less likely than those in firms of size less than 10 to leave formal-salaried employment and move into any other labor market state. Considering the fact that more than 90 percent of large firm employment is associated with formal-salaried state, this finding comes by no surprise. Whereas firm size 11-49 turns out as statistically significantly negative for only outflows into informal-salaried and formal self-employed groups. Results confirm the universally accepted stylized fact that informality declines sharply with increasing firm size. Taymaz (2009, p. 31) attributes this fact to: “the probability of enforcements, and productivity differentials since small firms are, on average, less productive and thus have a stronger incentive to operate informally to reduce the cost of compliance”. Firm size displays the similar effects when 2006-2008 and/or 2006-2009 transitions are considered, reflecting the fact that it is a pretty powerful predictor of formal-salaried workers’ mobility.

4.6.2. Transitions from Informal-Salaried Employment

For transitions of informal-salaried individuals, the coefficients of the multinomial logit regression represent the marginal effect of a given explanatory variable on the probability of moving into any given labor market state relative to remaining in the

informal-salaried state. First, there exists plentiful evidence for the impacts of gender on transition patterns of informal-salaried individuals. Women are significantly less likely than men to leave informal-salaried employment and move to either formal or informal self-employment. This finding points to women being more settled in informal-salaried positions and less likely to moving into self-employment. Whereas, they display a significantly higher probability of dropping out of the labor force as compared to men. As Cook et al. (2009) report, women are often disproportionately pushed out of salaried (i.e. formal or informal) employment and are disadvantaged compared to men for new employment opportunities in the labor market given equal qualifications. Notwithstanding, the reproductive role of women and traditional gender division of labor in family structure in Turkey are often the most important underlying causes. Turning to estimation results for 2006-2008 and 2006-2009 transitions, the effect of female dummy seems to remain robust. When combined with its high significance level, this finding suggests that gender is a powerful variable explaining mobility patterns of informal-salaried workers, particularly flows into self-employment and inactivity.

In the context of transitions out of informal-salaried state, age has almost no statistically significant explanatory power. The only remarkable age effect prevails for outflows into inactivity. Compared to the 15-24 age group, individuals aged 45-64 are more likely to perform a transition into inactivity rather than remain in informal-salaried state. Same results hold when one considers female-age interaction variables. Turkey's early and gender differentiated retirement policy and pension system are the primary reasons for such a pattern. Especially elderly women, either retired or laid off, find it comparatively harder to find new employment, hence become inactive. Turning to the 2006-2008 panel, one notices that informal-salaried workers aged 45-64 are significantly less likely to become formal-salaried. This finding is consistent with the fact that public sector jobs which account for a large share of formal-salaried employment, are often acquired at young ages. Moreover, generous pension schemes cause an epidemic of early retirement, after which elder individuals often move into

other types of employment or inactivity. Overall, age remains to be insignificant in explaining informal-salaried workers' transitions for the three and four year panel specifications as well. Any differences in estimation results are barely discernible.

It is interesting to note that marital status and children have no statistically significant relationship with any type of informal-salaried mobility. Household size, on the other hand, appears to somewhat explain transitions into informal self-employment, unemployment and inactivity. Considering the highly significant coefficient of *hsize* for all given outflows, one can readily assert that the probability of remaining in informal-salaried employment increases with the household size. Clearly, this result stems from increased responsibility and financial needs coming with increased household size. As for the 2006-2008 and 2006-2009 multinomial logit results, we observe that similar findings apply.

Regarding the education level and in line with the conventional wisdom, university graduates are significantly more likely than primary school graduates to move into formal-salaried state rather than remain in informal-salaried employment. Moreover, likelihood of flows into formal self-employment is significantly lower for uneducated and/or university graduates relative to the reference group of primary school graduates. We also find evidence that secondary school graduates are less likely to become inactive relative to primary school graduates. While interpreting results, one should account for the fact that primary school graduates dominate all labor market states with the highest share, and comprise about half of the labor force. Nevertheless, evidence appears to be in line with the existing theory and conventional wisdom that formality increases with education. For 2006-2008 and 2006-2009 transitions, the most notable change can be observed for individuals without any education. First, uneducated informal-salaried workers become significantly less likely than primary school graduates to move into informal-salaried employment. Given that share of formal-salaried employment is only 2 percent for uneducated individuals compared to 13 percent for primary school graduates, the result confirms our expectations.

Second, the sign of no education switches from positive to negative for outflows into unemployment and becomes significant for 2006-2009 estimation. This difference may be an impact of the economic crisis. Third, secondary school graduates become significantly more likely than primary school graduates to remain in informal-salaried employment when we increase time dimension of the panel. This result is nothing but typical given our basic premises.

Experience appears to be the most significant determinant of the outflows of informal-salaried workers. As experience increases, the likelihood of switching out of informal-salaried state to all other labor market states significantly falls. That is, higher the experience, higher the probability that an individual persists in informal-salaried state. This finding is consistent with the view pointed out by Galli and Kucera (2004, p. 4) and several studies, that returns to experience are often higher in informal employment.[26] However, experience variable seems to lose almost all of its explanatory power for the three and four year panels, albeit displaying the same signs.

The multinomial logit coefficient estimates for sector of economic activity imply that workers in agriculture, services and construction sectors are significantly less likely to become formal-salaried than industrial workers. As Table 4.5 depicts, share of formal-salaried employment in industry sector is approximately 70 percent. The evidence taken together, point to the intrinsically formal nature of industry. If one leaves informal-salaried state for formal-salaried employment, he/she is more likely to be employed in industry sector. Similarly, informal-salaried workers in construction and services sectors display a lower probability of transition into formal self-employment, compared to industrial workers. Moreover, we find evidence that probability of transition into informal self-employment is significantly lower for

[26] See Funkhouser (1996) for El Salvador, Guatemala, Honduras, Nicaragua and Costa Rica; Funkhouser (1997) for El Salvador; and Marcouiller *et al.* (1997) for El Salvador, Mexico and Peru for examples. Related evidence is found in two other studies. Telles (1993) finds higher returns to experience for both male and female unprotected workers (self-employed and employees) than for self-employed protected by social security in Brazil; and Mohan (1986) finds higher returns to experience for male self-employed workers than for blue-collar and white-collar employees in Colombia" (Galli and Kucera, 2004, p. 4).

construction workers, which can be attributed to the intrinsic salaried nature of construction sector. Lastly, informal-salaried workers in services sector are less apt to become inactive compared to workers in industry sector. Comparing and contrasting three sets of panels, we do not detect a marked disparity. Moreover, in order to scrutinize underlying dynamics, we have run intersectoral transition analysis individually for 2006-2007, 2007-2008 and 2008-2009.[27] Except for construction workers who recorded the highest outflow rate overall from 2008 to 2009, transition probabilities are somewhat similar implying that Turkish labor market exhibits a fairly static structure in terms of intersectoral mobility.

In line with the conventional literature and also our previous findings, there is a clear firm size influence. As firm size increases the probability of informal-salaried moving to formal-salaried state rises. Similar results hold for the corresponding variables in the 2006-2008 and 2006-2009 transitions.

4.6.3. Transitions from Formal Self-Employment

The discussion on the transitions of formal self-employed workers is deliberately kept brief, since their share in our sample is only minimal. We only present estimation results but refrain from making conclusive interpretations. Also, estimation results for 2006-2008 and 2006-2009 transitions are not discussed, since the number of observations becomes more than halved, thereby renders interpretations of estimation statistics muddled at best and erroneous at worst. Multinomial regression results mark a number of relationships between individual characteristics and probability of flows out of formal self-employment. The most evident explanatory factor in transitions out of formal self-employed state appears to be gender. The female dummy, albeit being significant for all outflows, should be approached with caution. Since the female

[27] See Appendix Table A.3, A.4 and A.5 for 2006-2007, 2007-2008 and 2008-2009 intersectoral transitions, respectively.

share of formal self-employment accounts for less than one percent of the sample, thus the marginal effects may be artificially high.

Regarding age, middle aged individuals (those between 25 to 44) are less likely to switch to informal-salaried state compared to those in the reference age group of 15-24. Furthermore, 25-44 aged formal self-employed workers are strongly less likely to become non-employed (unemployed and/or inactive) compared to the young. These findings represent a very lucid pattern of the Turkish labor market. As can also be observed in summary statistics in Table 4.5, formal self-employment in Turkey is mostly a middle age and male phenomena, which mostly corresponds to *voluntary or upper-tier* self-employment as put by Perry et al. (2007). On the other hand, informal self-employment, which comprises almost all unpaid family work, displays a rather equal distribution across age and gender groups. Following this line of thinking, it would not be wrong to conclude that informal self-employment in Turkey pertains to an *involuntary* or *lower-tier* self-employment type. For female-age interaction effect, we find that females aged 25-44 are significantly more likely than those aged 15-24 to perform a transition from formal into informal self-employment. On the other hand, women of age 45 to 64 display a higher probability of maintaining in formal self-employment rather than moving into formal- and/or informal-salaried employment, compared to women aged 15-24. This effect is reversed for transitions into inactivity.

With respect to education, we find that outflows into formal- and informal-salaried employment are significantly lower for the none educated workers compared to those with a primary school degree. The reverse is true for transitions into unemployment that is, non-educated are significantly more likely than primary school graduates to become unemployed. Secondary school graduates exhibit a 35 percent lower probability of transition out of formal self-employment into unemployment. University degree appears significantly negatively related with transitions into informal self-employment, unemployment and inactivity.

The likelihood of outflows into informal self-employment and unemployment are significantly lower for married who appear to be more persistent in formal self-employment compared to the singles. Though household size does not exert a significant effect on any outflow, having children turns out significantly negative at 5 percent for transitions into unemployment.

Regarding the sectoral effects, we find that for construction workers, probabilities of transition into informal-salaried, informal self-employed and inactive states are significantly lower than the probability of remaining in formal self-employment. Considering the fact that construction workers are only about one percent formal self-employed, the estimation results should not be taken as conclusive. The odds of being unemployed is lower for services workers.

4.6.4. Transitions from Informal Self-Employment

Informal self-employment accounts for the second largest state in the sample after inactives. The decomposition analysis depicts that majority of informal self-employed are female, low skill and work in agriculture sector. Combined with these findings illustrated in Table 4.5, multinomial logit evidence provides significant insight to the mobility dynamics of informal self-employed workers.

Female dummy is statistically significant for all the outflows from informal self-employment. Particularly, informal self-employed women exhibit a higher probability to move into inactivity, but a lower probability to move into all other states. Put differently, they are more persistent in informal self-employment. Considering the fact that shares of informal self-employment in male and female samples are almost identical, and that more than half of the female workers in our sample are employed as informal self-employed, the results are of great importance. When we increase the time dimension of the panel and consider 2006-2008 and 2006-2009 flows, female dummy loses much of its explanatory power except for the case of transitions into

inactivity. Particularly noticeable is the change of sign for transitions into unemployment, as informal self-employed women now exhibit a greater likelihood of becoming unemployed as opposed to their male counterparts. Though not found to be statistically significant, we consider a positive sign as more accurate. This finding may be interpreted as a reflection of the entry barriers faced by women. The robust effect of gender on transitions into inactivity is nothing but the manifestation of the magnitude of inactivity among women.

Age does not have a strong explanatory power in informal self-employment mobility patterns. We only find evidence that transitions from informal self-employment to inactivity is lower for 25-44 age group, but higher for 45-64 age group, compared to base group of 15-24. Additionally, probability of becoming unemployed compared to remaining in informal self-employment is lower for elder individuals. The findings are identical for 2006-2008 and 2006-2009 transitions as well.

Education has virtually no role in explaining mobility of informal self-employed workers for 2006-2007 transitions. The picture slightly changes if one considers three and four year transitions for 2006-2008 and 2006-2009. First, in conformity with the traditional theory, those informal self-employed with no education are found to be highly less likely than primary school graduates to become formal-salaried in 2006-2009 logit results. Moreover, university degree becomes highly significantly negative for moves into unemployment for both three and four year panels. Third, we find some evidence that if education level increases, likelihood of moving from informal self-employment to informal-salaried employment significantly falls. This result denotes that education, hence skill level of informal self-employed are on average lower than that of informal-salaried workers.

Experience is only significant for transitions out of informal self-employment into inactivity. More specifically, individuals with more work experience exhibit a lower

likelihood of becoming inactive compared to remaining in informal self-employment. The effect is robust for all panel specifications.

In the analysis of transitions out of informal self-employment, we trace significant sectoral effects. First, informal self-employed agricultural workers exhibit significantly lower probabilities for all transitions out of informal self-employment compared to that of industry workers. This finding is most likely a statistical artifact resulting from 80 percent of informal self-employment prevailing in agriculture but only about 5 percent in industry. Another interpretation would be that informal self-employment is a far more unstable labor market state where entry and exit are easier. Similarly, services workers are found to be negatively associated with all outflows, thereby significantly more persistent in informal self-employment compared to industry workers. However, the statistical results should arguably be approached with some caution considering that share of informal self-employment in industry sector is only trivial. For 2006-2008 and 2006-2009 transitions, similar findings are reported except for construction workers now being significantly far less likely than industry workers to move into formal-salaried state.

4.6.5. Transitions from Unemployment

In this section, we focus on the determinants of outflows from unemployment. Confirming our priors, we find that unemployed women are seemingly less likely than men to find employment, but more likely to become inactive. The effect of female dummy is negative (positive) and significant for outflows into formal and informal self-employments (inactivity). These results are in line with two salient gender-specific characteristics of the Turkish labor market: women are disadvantaged to get a job and/or less encouraged about wanting a job, thereby making fewer efforts to find work. With regards to three and four year transitions analysis, a noticeable finding is the significantly positive female coefficients for outflows into both formal

and informal-salaried employments in 2006-2008 logit results. This result is most likely just a statistical error.

Age also appears to play an important role in explaining mobility of the unemployed individuals. Odds of transition out of unemployment into formal-salaried, informal-salaried and inactive states are significantly lower for middle aged workers compared to the young. Similarly, the coefficients of 45-64 age dummy is significantly negative for outflows into formal-salaried, informal-salaried and formal self-employment states. This finding illustrates the higher persistence of the elderly in unemployment compared to the base age category of 15-24, who are somewhat more likely to find either salaried and/or self-employment jobs. More interesting are the coefficients of female-age interaction dummies. In particular, women of age 45-64 exhibit a significantly lower probability of finding a formal-salaried and/or informal self-employment position (i.e. leaving unemployment state) in relation to women of age 15-24. On the contrary, they are significantly more likely to become formal self-employed rather than remain as unemployed. When combined, reported coefficients imply that the young somewhat find it easier to move from unemployment into employment, which may be explained by their eagerness to find a job or employers being more favorably disposed toward employing younger workers. Age loses much of its explanatory power in mobility of the unemployed when 2006-2008 and 2006-2009 transitions are considered. The only robust effect is the 45-64 aged unemployed being significantly less likely than those 15-24 aged in moving to formal-salaried employment, which confirms the characteristic of Turkish labor market that formal-salaried employment is mostly attained in early ages of working life.

Marital status and having children do not exhibit a significant influence on outflows from unemployment. Household size, though only weakly significant, is negatively related to finding formal and/or informal self-employment. Put differently, as household size increases one is less likely to prefer self-employment to unemployment. That is, if other members of the household are employed one has less

incentives to find a job. Therefore, he/she can remain as unemployed for a longer time. Three and four year panels do not reveal any significant mobility pattern regarding household demographics. Combined with the fact that the one and only statistically significant household variable, *hsize*, is only merely significant, one may conclude that household demographics do not have a powerful influence in the mobility tendencies of the unemployed individuals.

With respect to education, we find that chances of finding a formal-salaried job out of unemployment state is significantly higher for high school and university graduates compared to the primary school graduates. The estimation results indicate that the coefficient of no education and secondary school dummies are statistically significant for transitions into formal self-employment. However, we prefer to view these coefficients with skepticism, since the share of formal self-employment is almost negligible for these two education groups. The estimation results for 2006-2008 and 2006-2009 transitions reveal more or less the same mobility patterns. Overall, the age effects confirm the conventional theory which presumes that the duration of unemployment is usually lower for individuals with higher levels of education.

Experience appears to be negatively related to the probability of giving up on job searching and dropping out of the labor force, although the significance is weak. This finding may be interpreted in the way that more experienced workers are often more encouraged to find employment compared to those with less experience, or that having experience enables them to find a job more easily than those less experienced. Almost identical results are reported for 2006-2008 and 2006-2009 transitions.

4.6.6. Transitions from Inactivity

High levels of inactivity, which account for more than 45 percent of our sample, have been a long-standing incidence in Turkish labor markets. However, as decomposition analysis reveals labor force detachment phenomenon is predominantly a product of

female inactivity. Multinomial evidence also confirms this fact, as women are found to display significantly lower probabilities for all outflows, or in other words higher persistence in inactivity. Simply put, women are voluntarily opting out of the labor force. The low level of female labor force participation rate can be explained by several structural determinants.[28] Moreover, gender effect on mobility of inactives are markedly robust for the 2006-2008 and 2006-2009 transitions.

We detect age to be a powerful determinant of transition probabilities pertaining to the inactives. In particular, middle aged and elderly individuals are significantly less likely to move out of inactivity than those in the reference age group 15-24. The age effects are robust for the 2006-2008 and 2006-2009 transitions. As reported by ILO (2010, p. 19) there is a strong fall in the labor force participation among youth since "many more youth now have the choice to stay in education rather than enter the labor market". Whereas, labor force participation rates are higher for higher age bands of 25-44 and 45-64 years. Turning to female-age interaction effect, women at age 25-44 are significantly more likely to become informal self-employed rather than remain out of labor force. Second, women at age 45-64 are found to be positively associated with outflows into formal-salaried and informal self-employed states, but negatively associated with transitions into formal self-employment.

Marital status, although weakly significant, exhibits a positive relationship with movements out of inactivity into employment. The evidence is most likely the result of increased household financial burden and welfare responsibilities. Therefore, one is more motivated to leave inactivity and look for employment opportunities. The result is also confirmed by the significantly negative coefficient of household size for transitions into unemployed. Put differently, the larger the household size, the greater is the likelihood of entering the labor force and searching for work.

[28] ILO (2010) lists key factors underlying low female labor force participation as religious, cultural and social norms, access to education; fertility; income level; institutions (legal framework, enterprises, labour unions, etc.); sectoral base of the economy (agricultural, industrial or service-based).

Regarding the influence of education on the probability of leaving inactivity, estimation results reveal a somewhat ambivalent picture. Overall, we find that as education level increases, the likelihood of leaving inactivity significantly falls. In particular, secondary school dummy is significant for transitions into both of salaried and self- informal employment. Inactives with high school degree are less likely than primary school graduates to move into informal-salaried, formal self-employment and informal self-employment states. Almost similar results hold for individuals with a university degree.

4.7. Concluding Remarks

Research on informal employment in Turkey has been confined only to aggregate and static statistics due to data limitations. Recently, TurkStat has introduced a nationally-representative and rich panel data set from the Income and Living Conditions Survey (SILC) which enables more thorough analysis of labor market dynamics. In this paper, we examine the mobility in the Turkish labor market with a specific emphasis on informality using the SILC panel data for the period between 2006 and 2009. In particular, we explore to what extent the Turkish evidence confirms the conventional labor market segmentation theory and characterize the labor mobility patterns and their underlying dynamics. In this regard, we first compute the Markov transition probabilities of individuals moving across the labor market states of formal-salaried, informal-salaried, formal self-employed, informal self-employed, unemployed and inactive. The transition analysis is conducted separately for both total and non-agricultural samples, considering the fact that agriculture sector, being almost 90 percent informal in Turkey, may conceal some important facts. The most evident aspect of the Turkish labor market during the given period is that inactives clearly dominate the labor force. Combined with female labor force being almost 70 percent inactive, labor market dynamics are driven considerably by these two main factors.

The transition probabilities display most of the characteristics peculiar to the Turkish labor market. Having computed the P-matrix of raw transition probabilities separately for 2006-2007, 2006-2008 and 2006-2009, we identify that the transition probabilities are fairly similar. The most discernible pattern is that most individuals remain in their initial state, except for the unemployed, implying a pretty static labor market structure. Formal-salaried individuals are found as the most reluctant to leave their state, confirming the traditional theory which sees formal employment as the ultimate desirable labor market state. Informal-salaried workers, on the other hand, demonstrate a higher level of mobility than those formal-salaried. The probability of transition from informal-salaried state to formal-salaried state is about 5 times of the probability of reverse transition, hence conforms to the traditional theory asserting one-way flows from informality to formality. Regarding the mobility patterns of informal self-employed individuals, outflows are fairly limited which may imply that the state is more like a *lower-tier* self-employment. However, exclusion of agriculture changes the picture to a remarkable extent. In particular, the transition probabilities of flows into all other states double, except for that into the inactive state. The unemployed appear as the most mobile among all labor market groups and display a heterogeneous transition pattern. A noteworthy finding is that probability of transition from unemployment to informal employment is almost twice of that to formal employment when 2006-2007 panel is considered. This result also depicts that formal employment opportunities are limited and have higher entry barriers. Inactives, who constitute the largest share of the labor force, exhibit almost negligible outflows indicating the rigid nature of the state. The result can be explained by discouraged worker effects and women deliberately opting out of the labor market.

Next, we conducted multinomial logit regressions individually for each set of panel to identify the impact of individual characteristics underlying worker transitions. The multinomial logit analysis is of considerable importance for designing policy to address labor informality and reduce its negative externalities. Gender evinces to be the most significant determinant of labor flows. The findings clearly support the view

that female are significantly disadvantaged in terms of labor market mobility. Particularly evident is that they are mostly found either in informal self-employment or inactive states, and display relatively lower probabilities of transition into other types of employment. This fact can be explained by several intrinsic factors including the traditional division of gender roles and family responsibility in the household, their reproductive role, negative discrimination against women in hires and layoffs and their lower average level of education. Following these lines, policy makers should first address the female labor force in order to reduce informality. Increasing their participation rate through positive discrimination tools and policies might alter the informality patterns drastically. Furthermore, investing in education, which turns out to be strongly negatively related to informality, may increase women's chances of finding formal employment.

The intrinsic demographics associated with individual and household characteristics also display noticeable relationships with labor market transitions. Regarding age, we find that the young often experience entry barriers to formal employment, confirming the traditional theory. Generous pension schemes resulting in an epidemic of early retirement, is also another significant determinant of mobility patterns in Turkey. In particular, elderly display higher probabilities of transitions into inactivity, but lower probabilities of transitions out of inactivity. Moreover, they are found to be more persistent in unemployment as compared to the young, who are somewhat more likely to find either salaried and/or self-employment jobs. Household size proves to display two notable effects on labor market transitions. First, we find that the probability of remaining in informal-salaried employment increases with the household size, which stems from increased responsibility and financial needs coming with increased household size. Whereas, as household size increases the probability of moving from unemployment to both types of self-employment falls.

Another key factor explaining labor market transition patterns is education. In line with the conventional wisdom, having a high school and university degree appears to

strongly reduce the probability of transition into informal employment. The level of entry barriers and risk of being subject to involuntary layoffs are usually lower for better-educated workers. Also, they display a higher probability of moving into formal employment compared to the less-educated individuals. Evidently, policy makers should aim at increasing the level of education, hence skills of the overall labor force in order to alleviate labor informality problem.

Sector of economic activity appears to play a fairly significant role in explaining most of the transitions in the labor market. Notably, we find that industrial workers are more likely to remain as formal-salaried, agricultural workers are less likely to move out of informal self-employment and construction workers display higher probability of becoming informal-salaried. The results, overall, signify the intrinsic nature of the given sector as an important determinant of the labor market flows.

To conclude, this chapter provides a comprehensive and detailed diagnosis of the Turkish labor market. The market is observed to display a rather static structure throughout the period considered. This indicates that a well recognition of underlying dynamics may help policy makers to produce various effective tools for addressing informality. However, we have not taken into account of the earnings aspect of formal/informal employment, which indeed constitute an essential factor in individuals labor market decisions. In the following chapter, having understood the underlying dynamics of worker flows across formal/informal and employment/non-employment states, we proceed with analyzing the earnings dynamics of informality using multiple techniques.

Table 4.1: Distribution of sample labor market states

	2006		2007		2008		2009	
	N	%	N	%	N	%	N	%
Formal Salaried (FS)	4,198	15.9	4,661	17.6	5,506	20.1	5,500	19.2
Informal Salaried (IS)	2,695	10.2	2,633	9.9	2,456	8.9	2,526	8.8
Formal Self-Employed (FSE)	805	3.1	944	3.6	1,089	3.9	981	3.4
Informal Self-Employed (ISE)	4,651	17.6	4,627	17.5	4,320	15.8	4,769	16.7
Unemployed (U)	1,433	5.4	1,268	4.8	1,477	5.4	1,917	6.8
Inactive (N)	12,567	47.7	12,342	46.6	12,533	45.8	12,886	45.1
Total	26,349	100	26,475	100	27,381	100	28,579	100

Source: Authors' own calculations based on SILC 2006-2009.
Notes: See Appendix Table A.2 for variable definitions.

Table 4.2: Distribution of sample labor market states (Male only)

	2006		2007		2008		2009	
	N	%	N	%	N	%	N	%
Formal Salaried (FS)	3,332	27.2	3,661	29.5	4,307	33.3	4,234	31.1
Informal Salaried (IS)	2,054	16.8	2,045	16.5	1,886	14.6	1,984	14.6
Formal Self-Employed (FSE)	748	6.1	835	6.7	994	7.7	896	6.6
Informal Self-Employed (ISE)	2,217	18.1	2,133	17.2	1,973	15.3	2,275	16.7
Unemployed (U)	1,093	8.9	991	8	1,080	8.4	1,358	9.9
Inactive (N)	2,789	22.8	2,728	22	2,689	20.8	2,890	21.2
Total	12,233	100	12,393	100	12,929	100	13,637	100

Source: Authors' own calculations based on SILC 2006-2009.
Notes: See Appendix Table A.2 for variable definitions.

Table 4.3: Distribution of sample labor market states (Female only)

	2006		2007		2008		2009	
	N	%	N	%	N	%	N	%
Formal Salaried (FS)	866	6.1	1,000	7.1	1,199	8.3	1,266	8.5
Informal Salaried (IS)	641	4.5	588	4.2	570	3.9	542	3.6
Formal Self-Employed (FSE)	57	0.4	109	0.8	95	0.7	85	0.6
Informal Self-Employed (ISE)	2,434	17.2	2,494	17.7	2,347	16.2	2,494	16.7
Unemployed (U)	340	2.4	277	1.9	397	2.8	559	3.7
Inactive (N)	9,778	69.3	9,614	68.3	9,844	68.1	9,996	66.9
Total	14,116	100	14,082	100	14,452	100	14,942	100

Source: Authors' own calculations based on SILC 2006-2009.
Notes: See Appendix Table A.2 for variable definitions.

Table 4.4: Composition of Informality in Total Sample and Non-Agricultural Sample (2006 and 2009 only)

	ALL SAMPLE				NON-AGRICULTURAL SAMPLE			
	2006		2009		2006		2009	
	Formal	Informal	Formal	Informal	Formal	Informal	Formal	Informal
	%	%	%	%	%	%	%	%
Gender								
Male	49.6	50.4	55.5	44.6	59.7	40.3	65.6	34.4
Female	23.5	76.5	31.2	68.8	57.5	42.5	66.6	33.4
Age								
15-24	28.3	71.7	35.2	64.8	41.5	58.5	51.7	48.3
25-44	52.1	47.9	59.6	40.4	67.8	32.2	73.7	26.3
45-64	28.7	71.3	31.9	68.1	49.8	50.2	53.3	46.8
Education								
None	6.4	93.7	7.8	92.2	20.7	79.4	22.2	77.9
Primary	32.6	67.5	36.6	63.4	48.2	51.8	53.0	47.0
Secondary	40.3	59.7	43.1	56.9	51.7	48.3	56.1	43.9
High	66.6	33.5	71.6	28.4	72.5	27.5	77.5	22.5
University	85.2	14.8	91.3	8.7	86.2	13.8	92.7	7.3
Marital								
Married	43.3	56.8	49.2	50.8	62.9	37.1	67.6	32.4
Single	36.1	63.9	43.8	56.2	49.7	50.3	60.1	39.9
Occupation								
Legislators	62.2	37.8	68.3	31.8	62.3	37.7	68.3	31.7
Professionals	89.6	10.4	93.9	6.1	89.6	10.5	93.9	6.1
Technicians	81.3	18.7	86.9	13.1	81.4	18.6	86.9	13.2
Clerks	81.6	18.5	86.1	13.9	81.6	18.4	86.1	13.9
Service Workers	49.4	50.6	55.0	45.0	49.4	50.6	55.0	45.0
Skilled Agricult.	9.7	90.3	10.6	89.4	64.9	35.1	56.0	44.0
Craftsmen	41.7	58.3	50.7	49.3	41.7	58.3	50.6	49.4
Plant Operators	62.0	38.0	68.2	31.8	62.1	37.9	68.4	31.7
Elementary Opr.	37.2	62.8	40.1	59.9	48.3	51.7	52.4	47.6
Sector								
Agriculture	9.0	91.0	10.0	90.0				
Mining	81.1	18.9	67.6	32.4	81.1	18.9	67.6	32.4
Manufacturing	64.1	35.9	71.9	28.1	64.1	35.9	71.9	28.1
Utilities	96.9	3.1	96.3	3.7	96.9	3.1	96.3	3.7
Construction	26.2	73.8	39.0	61.0	26.2	73.8	39.0	61.0
Trade	50.5	49.6	60.1	39.9	50.5	49.6	60.1	39.9
Hotels&Rest.	46.7	53.3	49.5	50.5	46.7	53.3	49.5	50.5
Transportation	48.6	51.4	54.8	45.3	48.6	51.4	54.8	45.3
Finances	87.6	12.4	90.1	9.9	87.6	12.4	90.1	9.9
Business Services	71.3	28.8	80.7	19.3	71.3	28.8	80.9	19.1
Public Admin.	93.6	6.4	90.2	9.8	93.6	6.4	90.2	9.8
Education	92.1	7.9	94.2	5.9	92.1	7.9	94.2	5.9
Health	91.4	8.6	93.7	6.3	91.4	8.6	93.7	6.3
Others	33.4	66.6	35.8	64.2	33.4	66.6	35.8	64.2
Employment Status								
Regular employees	73.5	26.5	80.7	19.3	74.1	25.9	81.3	18.7
Casual employees	5.9	94.1	9.5	90.5	7.7	92.3	11.7	88.3
Employers	59.4	40.6	71.0	29.0	64.3	35.7	76.1	23.9
Own-account workers	24.2	75.8	28.8	71.2	37.8	62.2	39.6	60.4
Unpaid family workers	4.3	95.7	4.2	95.8	16.0	84.0	17.3	82.7
Firm Size								
10 or less	22.9	77.1	27.9	72.1	37.2	62.8	44.3	55.7
11-49	68.9	31.1	76.2	23.8	73.0	27.0	80.0	20.0
50 or more	91.9	8.1	95.2	4.9	92.0	8.0	95.3	4.7
Household Type								
Single	56.9	43.1	65.4	34.6	69.6	30.4	76.4	23.6
No Children	39.3	60.7	48.5	51.5	58.2	41.8	68.4	31.6
With Children	42.0	58.0	47.5	52.5	59.5	40.6	64.7	35.3
Location								
Rural	23.5	76.6	25.5	74.5	52.8	47.2	55.4	44.6
Urban	58.8	41.2	65.7	34.4	61.6	38.4	68.9	31.2

Source: Authors' own calculations based on SILC 2006-2009
Notes: See Appendix Table A.2 for category definitions.

Table 4.5: Summary Statistics of the Variables by Labor Market State

		2006						2007						2008						2009					
		FS	IS	FSE	ISE	U	N	FS	IS	FSE	ISE	U	N	FS	IS	FSE	ISE	U	N	FS	IS	FSE	ISE	U	N
Gender																									
	Male	27.2	16.8	6.1	18.1	8.9	22.8	29.5	16.5	6.7	17.2	8	22	33.3	14.6	7.7	15.3	8.4	20.8	31.1	14.6	6.6	16.7	10	21.2
	Female	6.1	4.5	0.4	17.2	2.4	69.3	7.1	4.2	0.8	17.7	2	68.3	8.3	3.9	0.7	16.2	2.8	68.1	8.5	3.6	0.6	16.7	3.7	66.9
Age																									
	15-24	9.0	12	0.6	12.4	9.1	56.9	11.3	11.4	1	12.0	8	56.3	13.5	10.1	0.9	11.0	8.8	55.8	11.5	10.5	0.5	11.9	10.3	55.2
	25-44	25.2	11.4	4.3	17.1	5.4	36.7	27.6	10.7	4.6	17.1	4.6	35.4	30.7	9.6	5.2	14.7	5.3	34.6	30	9.3	4.8	15.2	6.8	33.9
	45-64	8.2	6.9	3.5	23.3	2.2	55.9	8.4	7.5	4.3	23	2.2	54.6	9.5	7.1	4.9	21.7	2.6	54.2	9.4	6.7	3.8	23.1	3.6	53.4
Marital																									
	Married	17.6	9.6	4.0	20.1	3.4	45.4	18.6	9.5	4.6	19.9	2.9	44.5	21.1	8.6	5.1	17.6	3.6	43.9	20.6	8.3	4.4	18.7	4.7	43.3
	Single	12.4	11.6	1.0	12.4	9.8	52.7	15.5	10.8	1.3	12.3	8.8	51.3	17.6	9.8	1.1	11.3	9.8	50.3	15.9	10.1	1.1	11.8	11.7	49.5
Children																									
	With	15.9	10.6	3.1	17	5.4	48	17.1	10.4	3.5	16.9	4.8	47.3	19.4	9.5	4.1	15.4	5.4	46.3	18.6	9.3	3.6	16.3	6.6	52
	No	16	9	3	19.7	5.6	46.8	19.1	8.6	3.7	19.2	4.8	44.6	22.3	7.5	3.7	16.9	5.4	44.2	21.1	7.5	3.0	17.7	7	51
Education																									
	None	1.4	7.1	0.7	25.2	3.5	62.1	1.5	6.9	1.3	25	2.9	62.4	2.0	7.7	1.2	24.0	3.2	62	1.8	7.3	0.9	24.8	3.5	61.8
	Primary	11.6	12.6	4.4	22.3	4.2	44.8	12.7	12.3	5.0	22.6	3.7	43.6	14.8	11	6	20.4	4.3	43.5	13.1	10.6	5.2	22.3	5.5	43.4
	Secondary	13.4	11.7	2.6	12.9	6.4	52.9	15.6	11.7	2.8	12.9	6	51.1	17.5	11	2.9	11.8	7.3	49.6	15.0	11.0	2.3	12.6	8.1	51
	High	28.2	8.4	3.2	7.6	8.7	43.9	30.2	8.3	3.9	7.6	7.4	42.7	32.8	6.6	4	6.9	7.8	41.9	32.4	7.4	4.0	7.5	10.0	38.8
	University	60.4	6	2.6	3.6	7.9	19.5	63.1	4.5	2.4	3.6	6.4	20	66.8	3	2.4	2.5	6.6	18.7	64.5	2.8	2.4	3.1	9.2	18
Sector																									
	Agriculture	0.6	8.1	8.0	83.2	0	0	0.7	8.2	9.2	81.8	0	0	1.7	8.5	10.4	79.5	0	0	1.3	8.4	8.6	81.6	0.1	0.2
	Industry	63	27.0	2.4	7.6	0	0	67.8	23.1	3.3	5.8	0	0	71.3	19.5	3.7	5.6	0	0	68.8	20.1	3.3	7.4	0.1	0.3
	Construction	23.7	68.8	1.5	6.1	0	0	28.0	64.5	2	5.4	0	0	35.9	56	2.6	5.6	0	0	34.9	53	2.9	7.7	1.2	0.4
	Services	53.5	25.0	7.7	13.8	0	0	55.5	23.1	8.3	13.1	0	0	59.3	19.3	9.2	12.3	0	0	58.2	20.1	7.9	13.3	0.1	0.3
Location																									
	Rural	8.8	9.1	4.6	36.2	4.0	37.4	9.9	9.3	5.5	36.1	3.6	35.6	11.6	8.8	6.2	33.6	4.2	35.5	9.7	8.6	5.2	36.3	4.3	35.9
	Urban	20.7	11	2	5.2	6.4	54.6	22.8	10.4	2.3	5	5.6	54	25.5	9.1	2.6	4.6	6.1	52.2	24.7	9.0	2.4	5.5	8.1	50.3
Firm Size																									
	10 or less	10.6	24.0	9.7	55.7	0	0	12.4	22.3	11.1	54.3	0	0	15.7	20.9	12.8	50.6	0	0	14.5	20.9	11	53.2	0.2	0.2
	11-49	69	29.7	0.1	1.2	0	0	69.7	29.4	0.2	0.8	0	0	76.1	23.2	0	0.7	0	0	75.9	22.5	0.1	1.1	0	0.5
	50 or more	91.9	8	0	0.1	0	0	92.8	7.2	0	0	0	0	94.2	5.8	0	0	0	0	94.8	4.8	0	0	0.1	0.3
Occupation																									
	Legislators	30.6	8.5	30	30.9	0	0	32.5	10.4	28.9	28.2	0	0	34.6	7.9	30.8	26.8	0	0	35.9	6.8	29.2	28	0	0.1
	Professionals	87.8	7	2.7	2.6	0	0	89.4	5.8	2.5	2.3	0	0	92.2	3.4	2.8	1.6	0	0	91.2	3.8	2.6	2.0	0	0.3
	Technicians	79.5	13.6	2.1	4.8	0	0	81.6	10.6	3.2	4.7	0	0	82.5	9.2	3.2	5.1	0	0	83.7	7.1	3.3	5.5	0.1	0.4
	Clerks	81.4	16.2	0.2	2.2	0	0	83.3	13.1	1.6	2.1	0	0	88.1	9.6	0.7	1.6	0	0	84.7	12.3	0.9	1.6	0	0.6
	Service Workers	46.7	37.1	3.1	13.2	0	0	47	35.2	4.3	13.6	0	0	51.9	29.6	6.3	12.2	0	0	49.9	34.4	4.4	10.9	0.1	0.3
	Skill. Agricultu.	0.6	0.5	8.7	90.1	0	0	0.5	0.9	10	88.6	0	0	0.5	0.4	11.4	87.6	0	0	0.8	1.0	9.6	88.4	0.0	0.2
	Craftsmen	35.3	46.9	5.2	12.7	0	0	40.4	43.1	6.0	10.5	0	0	47.7	35.1	6.6	10.7	0	0	43.3	34.8	6.3	14.8	0.5	0.3
	Plant Operators	56	27.8	6	10.2	0	0	61.8	22.6	6.6	9	0	0	63.9	19.3	8.8	8.1	0	0	59.8	20.9	7.8	11.2	0.1	0.2
	Elementary Opr.	36.4	53.4	0.7	9.5	0	0	40.5	51.6	0.9	7.1	0	0	41.6	49.8	1.1	7.5	0	0	38.9	42.6	1.0	16.5	0.6	0.4

Table 4.6: Transition Probabilities (P_{ij}) 2006-2007 (%)

TOTAL SAMPLE

	LMS2007					
LMS 2006	**FS**	**IS**	**FSE**	**ISE**	**U**	**N**
FS	89.3	2.8	0.4	0.9	2.7	4.1
IS	12.9	57.7	0.8	7.0	9.4	12.2
FSE	3.3	2.6	78.8	12.0	0.9	2.4
ISE	1.3	4.0	4.5	77.3	2.0	10.9
U	15.2	26.4	0.7	6.0	27.9	23.8
OLF	1.7	3.3	0.2	5.4	2.7	86.7
P.j (Total)	17.5	10.0	3.5	18.2	4.6	46.3

NON-AGRICULTURAL SAMPLE

	LMS2007					
LMS 2006	**FS**	**IS**	**FSE**	**ISE**	**U**	**N**
FS	89.8	2.7	0.4	0.4	2.7	4.1
IS	15.0	59.7	0.9	3.9	9.4	11.2
FSE	4.3	2.1	81.9	7.5	1.1	3.2
ISE	2.9	8.7	9.4	62.0	5.3	11.6
U	16.3	23.7	0.8	3.2	30.3	25.8
OLF	1.8	2.7	0.2	1.1	2.9	91.4
P.j (Total)	21.7	10.3	2.3	4.0	5.3	56.3

Source: Authors' own calculations based on SILC 2006-2007 (Panel observations only).
Notes: [1] P.j is the relative size of a state at the end of a period. [2] FS: Formal-salaried IS: Informal-Salaried FSE: Formal Self-employed ISE: Informal Self-employed U: Unemployed N: Inactive

Table 4.7: Transition Probabilities (P_{ij}) 2006-2008 (%)

TOTAL SAMPLE

	LMS2008					
LMS 2006	**FS**	**IS**	**FSE**	**ISE**	**U**	**N**
FS	85.0	3.7	0.8	1.3	3.8	5.4
IS	24.1	41.6	1.6	7.8	9.4	15.7
FSE	8.2	1.2	73.0	12.5	0.9	4.3
ISE	3.0	5.7	6.9	65.9	1.8	16.8
U	21.4	23.0	1.9	9.2	23.3	21.2
OLF	2.8	3.8	0.3	7.0	3.0	83.1
P.j (Total)	19.7	8.8	3.9	16.8	4.5	46.3

NON-AGRICULTURAL SAMPLE

	LMS2008					
LMS 2006	**FS**	**IS**	**FSE**	**ISE**	**U**	**N**
FS	78.7	4.5	0.7	2.6	6.5	7.1
IS	20.5	38.0	1.8	12.4	11.3	15.9
FSE	6.4	3.2	60.5	20.4	1.9	7.6
ISE	2.7	6.2	6.3	64.6	1.8	18.5
U	17.3	16.5	3.5	10.0	27.3	25.4
OLF	3.6	3.5	0.2	7.7	3.2	81.7
P.j (Total)	18.8	8.4	3.5	17.5	5.6	46.3

Source: Authors' own calculations based on SILC 2006-2008 (Panel observations only).
Notes: [1] P.j is the relative size of a state at the end of a period. [2] FS: Formal-salaried IS:Informal-Salaried FSE: Formal Self-employed ISE: Informal Self-employed U: Unemployed N: Inactive

Table 4.8: Transition Probabilities (P_{ij}) 2006-2009 (%)

TOTAL SAMPLE

	LMS2009					
LMS 2006	**FS**	**IS**	**FSE**	**ISE**	**U**	**N**
FS	78.7	4.5	0.7	2.6	6.5	7.1
IS	20.5	38.0	1.8	12.4	11.3	15.9
FSE	6.4	3.2	60.5	20.4	1.9	7.6
ISE	2.7	6.2	6.3	64.6	1.8	18.5
U	17.3	16.5	3.5	10.0	27.3	25.4
OLF	3.6	3.5	0.2	7.7	3.2	81.7
P.j (Total)	18.8	8.4	3.5	17.5	5.6	46.3

NON-AGRICULTURAL SAMPLE

	LMS2009					
LMS 2006	**FS**	**IS**	**FSE**	**ISE**	**U**	**N**
FS	79.6	4.4	0.7	1.5	6.6	7.3
IS	23.9	38.8	1.1	8.3	12.9	14.9
FSE	8.8	4.4	59.3	15.4	1.1	11.0
ISE	5.5	9.9	12.7	45.9	5.5	20.4
U	17.9	16.3	3.3	5.4	29.6	27.5
OLF	3.9	3.2	0.2	2.0	3.4	87.3
P.j (Total)	22.8	8.4	2.4	5.0	6.7	54.7

Source: Authors' own calculations based on SILC 2006-2008 (Panel observations only).
Notes: [1] P.j is the relative size of a state at the end of a period. [2] FS: Formal-salaried IS: Informal-Salaried FSE: Formal Self-employed ISE: Informal Self-employed

Table 4.9: Multinomial Logit estimation results (2006 to 2007 Transitions)

	MNL 1: Transitions out of Formal-Salaried						MNL 2: Transitions out of Informal-Salaried				
	FS to IS	**FS to FSE**	**FS to ISE**	**FS to U**	**FS to OLF**		**IS to FS**	**IS to FSE**	**IS to ISE**	**IS to U**	**IS to OLF**
female	-1.662*	-31.78***	-1.290	-0.152	0.703*	**female**	-0.330	-33.18***	-1.696*	-0.702	1.446***
age25to44	-2.501***	-4.169**	-0.225	-0.545	-1.478***	**age25to44**	-0.0167	-0.192	0.310	0.293	-0.300
age45to64	-1.389*	-3.013	0.437	0.601	1.415*	**age45to64**	-0.389	-2.006	0.275	0.887	1.497**
married	-0.115	1.650*	-1.292	-0.686	-0.750*	**married**	0.0487	0.574	-0.600	-0.461	-0.550
child	0.381	0.317	-0.0506	0.0972	0.0195	**child**	-0.309	-0.437	-0.0900	-0.125	-0.183
hsize	-0.120	-1.393**	-0.330	-0.165	-0.215**	**hsize**	-0.0403	-0.226	-0.274***	-0.182**	-0.181***
nosch	0.567	-31.74***	1.372	-0.747	-0.591	**nosch**	-0.664	-33.02***	0.520	0.661**	0.165
secondarysch	-0.290	-0.936	-0.234	-0.592	0.000163	**secondarysc**	-0.165	-1.454	-0.554	-0.471	-0.934***
highsch	-1.397***	0.944	-1.639**	-0.790**	-0.695**	**highsch**	0.331	0.245	-0.463	-0.128	-0.517
universityup	-1.872***	-32.21***	-2.210*	-2.081***	-1.130***	**universityup**	0.717*	-32.78***	-0.343	-0.331	-0.604
exper	-0.0369	0.0937	-0.110	-0.0938	-0.131***	**exper**	-0.0967**	-0.239**	-0.0673*	-0.121***	-0.143***
expersq	0.00193	-0.00158	0.00164	0.00115	0.00333***	**expersq**	0.00152	0.00670**	0.00174*	0.00198*	0.00322***
femX25to44	3.882***	1.901*	0.523	0.122	0.302	**femX25to44**	0.234	-0.0992	0.00989	-0.00445	-0.0899
femX45to64	3.091*	1.149	-32.97***	-0.445	-1.236	**femX45to64**	-0.201	1.912	0.595	-0.585	-1.318*
femXmar	-2.381**	-2.463*	0.547	0.264	1.291*	**femXmar**	-0.624	-0.700	1.164	-0.170	0.816
agriculture	0.550	-33.35***	-34.70***	-35.47***	-35.97***	**agriculture**	-1.705***	-1.702	0.384	0.168	-0.00923
construction	-0.0677	-33.11***	-0.143	0.215	-0.830	**construction**	-0.588*	-2.027**	-0.642*	0.0763	-0.517
services	-0.612*	0.0731	-0.383	-0.572*	-0.497*	**services**	-0.403*	-1.258**	-0.339	-0.225	-0.497**
fsize11to49	-0.901**	-33.41***	-0.156	-0.288	-0.428	**fsize11to49**	0.677***	-0.599	-0.933**	0.501*	0.0600
fsize50plus	-1.148***	-3.479**	-1.625*	-0.899**	-0.601*	**fsize50plus**	1.093***	-0.377	-0.325	0.507	0.380
N	2830	2830	2830	2830	2830	**N**	1784	1784	1784	1784	1784

Table 4.9: Multinomial Logit estimation results (2006 to 2007 Transitions) (continued)

MNL 3: Transitions out of Formal-Self Employed					
	FSE to FS	**FSE to IS**	**FSE to ISE**	**FSE to U**	**FSE to OLF**
female	-41.89***	-42.40***	-21.27***	-36.30***	-38.01***
age25to44	-0.0966	-1.191*	-0.800	-3.152***	-21.51***
age45to64	-0.647	-1.987	-0.465	2.237	3.586*
married	-0.539	-0.838	-1.147*	-1.242*	-1.754
child	-0.648	0.130	0.380	2.139*	-0.0635
hsize	0.0565	-0.450	-0.150	-0.411	-0.164
nosch	-36.35***	-37.21***	-1.003	2.848**	-0.459
secondarysch	0.380	0.990	0.201	-35.63***	0.120
highsch	0.229	-0.221	-0.213	1.207	0.622
universityup	-0.809	0.282	-39.12***	-38.68***	-38.92***
exper	-0.0900	-0.0410	-0.0109	0.147	-0.268*
expersq	-0.000305	0.000952	0.000714	-0.00821*	0.00559*
femX25to44	21.82	23.68	22.70***	2.399	40.90
femX45to64	-9.548***	-11.47***	23.79	1.983	20.48***
femXmar	18.76	20.03	-0.769	-1.310	20.31
agriculture	-0.710	0.292	0.0611	-3.119***	-2.470**
construction	2.548	-37.47***	-36.89***	2.038	-36.71***
services	-1.144	-0.442	-0.551	-4.342*	-0.657
N	542	542	542	542	542

MNL 4: Transitions out of Informal-Self Employed					
	ISE to FS	**ISE to IS**	**ISE to FSE**	**ISE to U**	**ISE to OLF**
female	-2.016*	-1.331**	-1.123*	-1.255*	0.990***
age25to44	-0.109	-0.475	0.320	-0.873	-1.252**
age45to64	-0.636	-0.560	-0.192	-2.760**	0.905*
married	-0.822	0.395	0.355	-0.297	-0.148
child	-0.373	-0.296	-0.738***	-0.0848	0.0295
hsize	-0.104	0.111	0.0180	-0.0994	-0.0393
nosch	-0.774	0.0963	-0.101	0.471	0.232
secondarysch	-0.0959	-0.221	-0.186	-0.283	-0.281
highsch	0.399	-0.402	0.233	-0.395	0.0392
universityup	0.180	-1.869	-0.224	0.0551	0.258
exper	-0.000698	0.000781	-0.0150	0.0759	-0.106***
expersq	-0.000936	-0.00108	0.000184	-0.00171	0.00179***
femX25to44	-0.618	0.510	-0.724	0.159	1.303*
femX45to64	-30.58***	0.274	0.177	1.858	-0.275
femXmar	-0.0163	-0.545	-0.162	-1.513	-0.252
agriculture	-1.767***	-2.231***	-2.177***	-2.243***	-1.623***
construction	-1.906	-0.611	-2.211**	-1.510	-0.807
services	-1.224*	-1.525***	-1.528***	-1.197**	-1.216***
fsize11to49	-31.92***	2.114*	1.075	-32.33***	0.304
fsize50plus	29.22	27.14***	-8.462***	-7.615***	-8.843***
N	3253	3253	3253	3253	3253

Table 4.9: Multinomial Logit estimation results (2006 to 2007 Transitions) (continued)

	MNL 5: Transitions out of Unemployed						MNL 6: Transitions out of Inactive				
	U to FS	**U to IS**	**U to FSE**	**U to ISE**	**U to OLF**		**OLF to FS**	**OLF to IS**	**OLF to FSE**	**OLF to ISE**	**OLF to U**
female	-0.04	-0.04	-32.79***	-40.42***	1.436**	**female**	-1.442**	-1.238***	-43.02***	-1.871***	-1.529**
age25to44	-0.973*	-1.117**	0.57	-0.24	-1.421**	**age25to44**	-3.873**	-1.662*	-2.126*	-3.462***	-0.63
age45to64	-1.631*	-1.902**	-32.09***	0.14	0.16	**age45to64**	-5.175***	-2.499***	-3.254*	-3.732***	-2.356**
married	0.64	0.53	-0.15	-0.71	0.34	**married**	3.038*	0.06	2.929**	0.38	-0.11
child	-0.33	0.35	-0.37	0.18	0.19	**child**	0.07	0.43	-1.808**	0.18	-0.30
hsize	0.03	0.04	-0.940*	-0.259*	-0.04	**hsize**	-0.18	-0.13	-0.11	-0.11	-0.290*
nosch	-0.79	0.06	-32.99***	-0.36	0.13	**nosch**	-1.65	0.03	0.40	0.32	0.38
secondarysch	0.09	-0.20	-33.83***	-1.08	-0.33	**secondarysch**	-0.87	-0.815**	-0.27	-0.730*	0.06
highsch	0.700*	-0.19	0.29	-0.07	0.50	**highsch**	0.35	-0.789**	-32.16***	-0.962**	-0.11
universityup	1.409**	-0.81	1.08	-0.03	0.28	**universityup**	0.65	-0.33	-32.51***	-2.554*	0.01
exper	0.05	0.05	-0.04	0.02	-0.103*	**exper**	-0.07	0.02	-0.21	0.0806**	-0.01
expersq	0.00	0.00	0.00	0.00	0.00269*	**expersq**	0.00	0.00	0.00	-0.00122*	0.00
femX25to44	0.29	0.13	-0.90	19.61	0.80	**femX25to44**	2.81	1.05	22.61	2.722**	0.78
femX45to64	-35.63***	1.17	34.07***	-17.13***	-0.18	**femX45to64**	3.585*	0.49	-7.961***	2.216**	0.20
femXmar	-0.14	0.00	-0.47	21.98	0.92	**femXmar**	-3.859**	-1.302*	16.39	-0.81	-0.98
N	661	661	661	661	661	**N**	2498	2498	2498	2498	2498

Source: Authors' own calculations based on SILC 2006-2007 (Panel observations only).

Notes: [1] For variable definitions, see Appendix Table A.2 [2] FS: Formal-salaried IS: Informal-Salaried FSE: Formal Self-employed ISE: Informal Self-employed [3] The results are the marginal effects for the MNL model [4] Dependent variable Base category: MNL 1: Remaining in FS, For MNL 2:Remaining in IS, For MNL 3: Remaining in FSE, For MNL 4:Remaining if IS, MNL 5: Remaining in U, MNL 6: Remaining in N [5] Independent variable Base category: Male, Age 15-24, single, does not have a child, primary school graduate, industry sector, firm size 1-10.

Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table 4.10: Multinomial Logit estimation results (2006 to 2008 Transitions)

MNL 1: Transitions out of Formal-Salaried						MNL 2: Transitions out of Informal-Salaried					
	FS to IS	FS to FSE	FS to ISE	FS to U	FS to OLF		IS to FS	IS to FSE	IS to ISE	IS to U	IS to OLF
female	-1.264	-36.89***	-21.59***	-0.0403	0.562	[illegible]	-0.633	-40.79***	-22.52***	-0.380	0.969*
age25to44	-1.669***	-1.797*	-0.899	-0.260	-1.518***	**age25to44**	0.0417	-1.373	0.707	-0.00180	-1.260*
age45to64	-0.700	-0.650	1.617	1.194	1.156*	**age45to64**	-1.063*	-2.502	0.367	-0.250	0.908
married	-0.621	0.0845	-1.078	-0.676	-0.341	**married**	-0.213	0.410	-0.707	-0.969*	-0.875
child	0.148	0.377	-0.198	-0.104	-0.294	**child**	-0.112	-0.210	0.0107	-0.179	-0.340
hsize	-0.0486	-0.572*	-0.293	0.0259	-0.141	**hsize**	0.0988	-0.265	-0.229*	-0.0778	-0.0566
nosch	-0.801	-35.81***	-37.72***	-0.997	-38.83***	**nosch**	-1.232**	-41.14***	-0.101	-0.0291	-0.217
secondarysch	-0.726*	-1.058	-0.414	-1.175**	-0.485	**secondarysch**	-0.193	-1.894	-0.884*	-0.238	-0.756*
highsch	-1.187**	-0.559	-0.618	-0.813**	-0.972***	**highsch**	0.438	0.423	-0.755	-0.235	0.00369
universityup	-1.834***	-36.99***	-2.363*	-1.516***	-0.987**	**universityup**	0.982*	-40.30***	-41.58***	-0.249	-0.301
exper	-0.0413	0.125	-0.00856	-0.113*	-0.0665	**exper**	-0.0000801	-0.125	-0.0271	-0.0514	-0.0416
expersq	0.00248*	-0.00725	-0.00116	0.00149	0.00202	**expersq**	-0.000720	0.00473*	0.000863	0.00135	0.00139
femX25to44	1.852	0.857	22.32	-0.370	0.613	**femX25to44**	0.0332	0.812	20.39***	-0.479	0.579
femX45to64	1.759	1.540	-15.99***	-36.74***	-0.485	**femX45to64**	0.908	1.241	20.00	-1.230	-0.825
femXmar	-1.529	-0.610	0.226	-1.208	0.805	**femXmar**	-0.516	-0.567	1.719	0.809	1.457*
agriculture	0.169	-36.63***	1.508	-37.50***	-0.391	**agriculture**	-0.811*	-0.434	0.0203	0.135	-0.0101
construction	1.014*	-35.99***	0.651	0.563	-0.196	**construction**	-0.721**	-1.546	-1.118**	0.247	-0.846*
services	-0.403	-0.277	-0.783	-0.734**	-0.555*	**services**	-0.105	-0.206	-0.308	0.0906	-0.303
fsize11to49	-0.837**	-1.407*	-1.341*	-0.402	-0.588*	**fsize11to49**	0.617**	-0.473	-0.212	-0.135	0.0901
fsize50plus	-1.280***	-2.588***	-1.129*	-0.623*	-0.552*	**fsize50plus**	0.423	-0.432	-1.876	0.284	0.277
N	1845	1845	1845	1845	1845	**N**	1097	1097	1097	1097	1097

Table 4.10: Multinomial Logit estimation results (2006 to 2008 Transitions) (continued)

MNL 3: Transitions out of Formal-Self Employed						MNL 4: Transitions out of Informal-Self Employed					
	FSE to FS	FSE to IS	FSE to ISE	FSE to U	FSE to OLF		ISE to FS	ISE to IS	ISE to FSE	ISE to U	ISE to OLF
female	0.0102	27.16	3.407**	-11.65**	26.19***	ɛ	-1.461	-0.784	-1.014	0.241	1.516***
age25to44	-0.685	-3.614***	-0.497	-4.103**	-0.0297	**age25to44**	0.0147	-0.755	0.471	0.979	-1.18
age45to64	-0.0946	-2.719	0.821	-3.170**	5.773*	**age45to64**	-0.999	-0.896	-0.254	0.578	1.415*
married	-0.248	-2.097*	-0.351	0.589	-0.357	**married**	0.331	0.966*	0.192	-0.543	-0.66
child	0.460	-1.995*	-0.388	-0.151	-0.411	**child**	-0.477	-0.391	-0.524*	0.131	0.128
hsize	-0.235	-1.327***	-0.0668	-1.081	-0.0482	**hsize**	-0.0608	0.163**	0.0965	-0.074	0.0309
nosch	-35.69***	-34.95***	0.204	2.892	0.982	**nosch**	-0.245	-0.101	-0.32	-0.484	-0.00912
secondarysch	0.0886	-36.23***	-0.253	1.136	0.826	**secondarysch**	0.308	-0.279	-0.44	0.376	-0.199
highsch	0.0414	-38.01***	-0.403	-34.40***	0.873	**highsch**	1.086**	-1.267**	0.169	-1.004	-0.527
universityup	0.774	1.380	-0.432	-33.81***	-38.75***	**universityup**	0.974	-0.606	0.513	-31.93***	0.0243
exper	-0.0569	0.758***	-0.0557	0.134	-0.441**	**exper**	-0.0172	-0.0215	0.013	-0.124*	-0.0718**
expersq	-0.000334	-0.0194***	0.000798	-0.00111	0.00785**	**expersq**	-0.0000594	-0.000838	-0.000484	0.00198	0.00131**
femX25to44	-28.78	-30.13***	-57.14	-49.65***	-40.39***	**femX25to44**	0.179	0.295	-0.515	-0.771	1.209
femX45to64	-41.54***	-47.79***	-32.69***	-30.42***	-17.09	**femX45to64**	-28.74***	0.101	-0.235	0.457	-0.959
femXmar	28.35	10.79	54.41	30.44***	16.49**	**femXmar**	-2.345	-1.237	-0.578	-1.561	0.143
agriculture	0.224	-1.551	-0.0644	-2.481	-2.705*	**agriculture**	-1.850***	-1.548***	-1.915***	-2.545***	-1.863***
construction	0.903	-32.77***	-37.09***	-35.76***	-39.14***	**construction**	-33.61***	0.078	-0.758	-0.484	-1.316
services	-0.363	-0.952	-0.765	-0.980	-1.219	**services**	-1.261*	-0.975*	-1.583***	-1.054	-1.444***
						fsize11to49	-30.98***	2.469**	-31.85***	-30.23***	0.369
N	329	329	329	329	329	**N**	1959	1959	1959	1959	1959

Table 4.10: Multinomial Logit estimation results (2006 to 2008 Transitions) (continued)

MNL 5: Transitions out of Unemployed						MNL 6: Transitions out of Inactive					
	U to FS	U to IS	U to FSE	U to ISE	U to OLF		OLF to FS	OLF to IS	OLF to FSE	OLF to ISE	OLF to U
female	23.72***	23.03***	-10.57***	-15.72	25.56***	**female**	-1.729**	-1.554***	-34.26***	-1.808***	-1.725**
age25to44	-0.821	-0.248	1.374	0.0436	-0.668	**age25to44**	-1.805	-1.997**	-0.833	-4.151***	-2.155
age45to64	-36.75***	-1.191	0.866	-0.388	1.024	**age45to64**	-4.334***	-2.654***	-2.963	-4.630***	-3.783***
married	0.39	0.228	0.553	-0.365	0.465	**married**	0.29	0.819	4.095**	2.080*	0.516
child	-1.017*	-0.0756	-0.8	-0.0405	-0.702	**child**	0.125	0.614*	-0.86	0.255	0.369
hsize	0.148	0.043	-0.298	-0.23	-0.0434	**hsize**	0.0538	-0.15	-0.355	-0.186*	-0.285
nosch	-1.44	-0.247	0.11	-0.178	0.319	**nosch**	-0.94	0.22	-0.246	0.103	0.0362
secondarysch	0.272	-0.353	0.168	-0.702	-0.174	**secondarysch**	-0.86	-0.0283	0.525	-0.0705	-0.208
highsch	1.026*	-0.0639	0.159	-0.436	0.554	**highsch**	0.516	-0.713*	-33.20***	-0.678*	-0.11
universityup	2.171**	0.061	0.409	0.656	1.284	**universityup**	1.305*	-0.0523	-33.19***	-1.565*	-0.807
exper	0.0442	0.0334	-0.326**	-0.0226	-0.144*	**exper**	-0.0762	-0.00827	-0.353*	0.0546	0.117
expersq	-0.00071	-0.000793	0.00684*	0.00191	0.00411*	**expersq**	0.00146	0.000204	0.00646*	-0.000754	-0.00368*
femX25to44	-22.91	-23.41***	-23.74***	-4.491***	-23.48***	**femX25to44**	0.63	2.225**	1.126	3.724***	2.332
femX45to64	-1.679	-0.19	-2.309	-19.19***	-3.386*	**femX45to64**	1.888	1.4	2.711	3.748***	0.771
femXmar	0.0646	0.993	0.596	22.03***	0.787	**femXmar**	-1.154	-2.120**	-5.048***	-2.294*	-2.695*
N	414	414	414	414	414	**N**	1598	1598	1598	1598	1598

Source: Author's own calculations based on SILC 2006-2008 (Panel observations only).

Notes: [1] For variable definitions, see Appendix Table A.2. [2] FS: Formal-salaried IS: Informal-Salaried FSE: Formal Self-employed ISE: Informal Self-employed [3] The results are the marginal effects for the MNL model [4] Dependent variable Base category: MNL 1: Remaining in FS, For MNL 2:Remaining in IS, For MNL 3: Remaining in FSE, For MNL 4:Remaining if IS, MNL 5: Remaining in U, MNL 6: Remaining in N [5] Independent variable Base category: Male, Age 15-24, single, does not have a child, primary school graduate, industry sector, firm size 1-10.

Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table 4.11: Multinomial Logit estimation results (2006 to 2009 Transitions)

MNL 1: Transitions out of Formal-Salaried						MNL 2: Transitions out of Informal-Salaried					
	FS to IS	**FS to FSE**	**FS to ISE**	**FS to U**	**FS to OLF**		**IS to FS**	**IS to FSE**	**IS to ISE**	**IS to U**	**IS to OLF**
female	-38.73***	-38.79***	-23.01***	-0.820	1.069*	**female**	-0.553	-39.59***	0.473	0.537	2.197**
age25to44	-1.825**	-3.128*	-0.948	-0.665	-1.274*	**age25to44**	-0.337	-3.254***	0.672	-0.0472	-0.705
age45to64	-0.815	-36.23***	1.119	-0.685	1.283	**age45to64**	-1.577	-25.13***	-0.112	1.083	0.0567
married	-0.314	-1.089	-1.363*	-0.863	-1.596**	**married**	-0.455	1.500	-0.676	-0.954	-0.237
child	0.954	1.112	0.649	-0.383	-0.162	**child**	0.0926	-1.714**	0.262	-0.421	-0.541
hsize	-0.212	-0.871	-0.138	-0.0328	0.0226	**hsize**	0.0880	-0.259	0.0291	-0.0990	-0.0355
nosch	-42.23***	-36.59***	-0.691	-41.21***	-1.654	**nosch**	-2.925**	-42.81***	-0.537	-1.364*	-0.201
secondarysch	-0.981*	-1.355	-1.655*	-0.00280	-1.054*	**secondarysch**	-0.0477	0.0553	-1.535**	-0.802	-0.832
highsch	-1.014*	-0.773	-0.987	-0.609	-1.867***	**highsch**	0.518	0.492	-2.648*	0.221	-0.659
universityup	-1.939*	-38.83***	-2.711*	-0.757	-1.169*	**universityup**	1.013	-40.81***	-1.108	-1.871	-0.401
exper	-0.0472	0.517	-0.0299	-0.0210	0.0382	**exper**	-0.0148	0.135	-0.0928	0.0664	-0.0532
expersq	0.00249	-0.0222	-0.000821	0.00114	-0.000168	**expersq**	-0.000747	-0.00298	0.00294*	-0.00264	0.00255*
femX25to44	18.92	18.97	22.50	-0.662	-0.973	**femX25to44**	0.220	-19.79***	-0.843	0.187	-0.268
femX45to64	-20.56***	14.85***	-16.39***	-40.24***	-2.536*	**femX45to64**	0.321	43.81	-0.784	-2.117	-1.080
femXmar	20.20	21.13	-37.96***	0.922	2.424*	**femXmar**	0.177	19.39	0.895	0.967	1.029
agriculture	-39.99***	-37.77***	1.449	1.535	-41.43***	**agriculture**	-2.026*	-0.180	-0.350	-1.473*	-0.385
construction	1.572**	-36.57***	0.640	0.388	0.790	**construction**	0.0958	-0.305	-0.899	0.108	-0.997
services	-0.193	-0.237	-0.0721	-0.535	-1.078**	**services**	0.173	-0.339	-0.132	-0.439	-0.429
fsize11to49	-0.718	-2.153	-0.0618	0.107	-0.925*	**fsize11to49**	0.791*	-0.993	-0.616	0.123	-0.626
fsize50plus	-1.687***	-39.23***	-1.181*	-0.431	-0.173	**fsize50plus**	1.150*	0.710	-43.24***	1.082	-0.658
N	891	891	891	891	891	**N**	547	547	547	547	547

Table 4.11: Multinomial Logit estimation results (2006 to 2009 Transitions) (continued)

MNL 3: Transitions out of Formal-Self Employed						MNL 4: Transitions out of Informal-Self Employed					
	FSE to FS	FSE to IS	FSE to ISE	FSE to U	FSE to OLF		ISE to FS	ISE to IS	ISE to FSE	ISE to U	ISE to OLF
female	-41.66***	-38.64***	-20.29***	26.04*	-3.302*	**female**	-1.770	0.189	-1.596	0.326	2.805***
age25to44	-1.429	0.187	-1.496	-29.65	-0.439	**age25to44**	-1.251	-0.292	0.680	-0.469	-0.741
age45to64	-2.276	4.180	-0.373	-76.28***	1.571	**age45to64**	-3.212*	-0.0205	-0.432	-1.642	1.924*
married	-0.726	-0.403	-0.551	21.61	-1.778	**married**	0.254	1.885**	0.595	0.252	-0.0108
child	0.0562	-1.317	0.483	9.919	-0.426	**child**	0.0424	-0.757	-0.361	-0.333	0.134
hsize	-0.493	0.222	-0.136	-23.86***	0.225	**hsize**	-0.136	0.206*	0.0404	-0.191	0.000877
nosch	-37.94***	-34.60***	0.124	10.56*	1.145	**nosch**	-34.97***	0.233	-0.805	-0.428	0.131
secondarysch	0.0919	2.764**	0.517	-72.19***	1.097	**secondarysch**	0.570	-0.139	-0.942	-0.363	-1.218*
highsch	-1.251	2.024	0.186	3.972*	-39.64***	**highsch**	0.407	-0.934	-0.164	-1.088	0.00641
universityup	0.989	-39.30***	1.003	-27.89***	0.115	**universityup**	1.183	-36.03***	0.565	-35.27***	0.780
exper	0.00863	0.0614	0.00195	-1.697	-0.00496	**exper**	0.0465	-0.0920	-0.0160	-0.0390	-0.0962**
expersq	-0.000980	-0.00751	0.000754	0.0479	0.000439	**expersq**	-0.000431	0.0000382	-0.00000844	0.000358	0.00168*
						femX25to44	-32.33***	-0.504	-0.377	-35.34***	0.506
femX45to64	23.21***	26.18***	22.66***	41.41***	22.56	**femX45to64**	-28.90***	-35.71***	-0.187	1.118	-1.641
femXmar	4.520	-1.629	21.65	-25.25	6.494	**femXmar**	-33.24***	-2.081*	-0.314	-1.790	-0.582
agriculture	0.760	-3.545	-0.266	56.43	-3.624*	**agriculture**	-1.595	-1.765**	-1.882**	-1.728	-2.529***
construction	35.07***	-8.639***	-8.380***	126.0***	-8.288***	**construction**	-36.51***	0.840	-0.232	2.043	-36.57***
services	1.884	-3.496*	-0.338	12.27**	-1.311	**services**	-1.051	-1.363*	-1.459*	-0.121	-1.901***
						fsize11to49	-34.80***	2.534**	-35.72***	-33.96***	0.584
N	157	157	157	157	157	**N**	889	889	889	889	889

Table 4.11: Multinomial Logit estimation results (2006 to 2009 Transitions) (continued)

	MNL 5: Transitions out of Unemployed						MNL 6: Transitions out of Inactive				
	U to FS	**U to IS**	**U to FSE**	**U to ISE**	**U to OLF**		**OLF to FS**	**OLF to IS**	**OLF to FSE**	**OLF to ISE**	**OLF to U**
female	-1.961	-38.26***	-41.35***	-21.45***	1.270	**female**	-1.721*	-2.458*	-40.53***	-2.350***	-0.626
age25to44	-1.472	0.0728	0.206	-1.669	0.145	**age25to44**	-1.366	-0.707	-58.86***	-20.49***	-20.68***
age45to64	-39.05***	0.268	-34.30***	-0.877	1.399	**age45to64**	-2.209*	-1.454	-20.84	-21.85***	-21.91***
married	-0.984	-0.972	1.225	-0.492	-1.524	**married**	-1.347	0.753	22.41***	18.89***	21.11***
child	-0.0446	1.122	0.143	0.655	-0.0338	**child**	0.773	0.848*	0.189	0.127	0.919
hsize	0.0416	-0.157	-0.267	-0.138	-0.176	**hsize**	-0.194	-0.191	-0.291	-0.129	-1.086**
nosch	-0.709	-0.0446	-34.65***	-1.364	1.370	**nosch**	-39.57***	-0.843	-37.96***	0.276	-0.810
secondarysch	0.774	0.388	-0.121	0.244	-1.005	**secondarysch**	-0.283	-0.319	0.0739	0.487	0.222
highsch	1.058	0.522	1.441	-0.948	1.477*	**highsch**	0.765	0.247	-37.23***	-0.522	0.916
universityup	3.904*	-35.27***	3.017	0.670	1.342	**universityup**	0.781	-0.639	-37.92***	-1.842	-0.114
exper	0.186	0.0473	-0.346	0.154	-0.138	**exper**	0.0314	-0.122*	-0.329	0.0765	0.0439
expersq	-0.00497	-0.00309	0.00633	-0.00469	0.00491*	**expersq**	-0.00275	0.00261*	0.00486	-0.00108	-0.00310
femX25to44	-0.447	-0.582	19.39	0.128	-1.206	**femX25to44**	0.0703	0.799	59.13***	20.33	20.69***
femX45to64	34.96	36.16	53.35**	-0.356	34.19	**femX45to64**	0.294	0.152	21.89***	21.18***	21.16
femXmar	3.357*	2.525*	21.97	23.28	3.762*	**femXmar**	0.938	-0.989	-23.02***	-19.08***	-22.94***
N	189	189	189	189	189	**N**	729	729	729	729	729

Source: Author's own calculations based on SILC 2006-2009 (Panel observations only).

Notes: [1] For variable definitions, see Appendix Table A.2. [2] FS: Formal-salaried IS: Informal-Salaried FSE: Formal Self-employed ISE: Informal Self-employed [3] The results are the marginal effects for the MNL model [4] Dependent variable Base category: MNL 1: Remaining in FS, For MNL 2:Remaining in IS, For MNL 3: Remaining in FSE, For MNL 4:Remaining if IS, MNL 5: Remaining in U, MNL 6: Remaining in N [5] Independent variable Base category: Male, Age 15-24, single, does not have a child, primary school graduate, industry sector, firm size 1-10.

Legend: * for p<.05, ** for p<.01, and *** for p<0.001

Table A.2: List of Definitions

i. Definition of Labor Market States

Formal Salaried (FS)	Regular or casual employee who are wage employed AND registered to the Social Security Institution
Informal Salaried (IS)	Regular or casual employee who are wage employed AND not registered to the Social Security Institution
Formal Self-employed (FSE)	Self-employed or unpaid family worker AND registered to the Social Security Institution
Informal Self-employed (ISE)	Self-employed or unpaid family worker AND not registered to the Social Security Institution
Unemployed (U)	Those who do not work in the reference week BUT available for work AND actively searching
Inactive (N)	Those who do not work in the reference week, not available for work AND not actively searching

ii. Definition of Multinomial Logit Model Explanatory Variables

Gender		
	"male"	Male (Base category)
	"female"	Female
Age		
	"age15to24"	Age 15-24 (Base category)
	"age25to44"	Age 25-44
	"age45to64"	Age 45-64.
Marital Status		
	"single"	not married (Base category)
	"married"	married
Education		
	"nosch"	Illiterates and individuals who are literate but did not graduate from a school
	"primarysch"	Primary school graduate (Base category)
	"secondarysch"	Secondary school graduate
	"highsch"	High school or vocational school graduate
	"universityup"	University or higher graduate
Children		
	"nochild"	Does not have children (Base category)
	"child"	Has children
Economic Sector		
	"agriculture"	Agriculture
	"industry"	Mining, manufacturing and utilities (Base category)
	"construction"	Construction
	"services"	Trade, hotels and restaurants, transportation, financial intermediation, business services, public administration, education, health, others.
Firm Size		
	"fsize1to10"	Establishments with 1-10 employees (Base category)
	"fsize11to49"	Establishments with 11-49 employees
	"fsize50plus"	Establishments with50 or more employees
Household Size		
	"hsize"	Number of individuals in the household of the survey respondent excluding himself/herself.
Work Experience		
	"exper"	Total number of years a survey respondent has worked for.
Female-Age Interaction		
	"femX15to24"	Female AND aged 15-24 (Base category)
	"femX25to44"	Female AND aged 25-44
	"femX45to64"	Female AND aged 45-64
Female-Marital Interaction		
	"femXsing"	Female AND single (Base category)
	"femXmar"	Female AND married

Table A.3: Intersectoral Transition Frequencies and Probabilities (Pij) (2006 to 2007)

	Sector 2007				
Sector 2006	**Agriculture**	**Manufacturing**	**Construction**	**Services**	**Total**
Agriculture	2,751	24	28	68	2,871
	95.82	**0.84**	**0.98**	**2.37**	**100**
Manufacturin	25	1,184	22	69	1,300
	1.92	**91.08**	**1.69**	**5.31**	**100**
Construction	20	15	387	28	450
	4.44	**3.33**	**86**	**6.22**	**100**
Services	54	68	27	3,119	3,268
	1.65	**2.08**	**0.83**	**95.44**	**100**
Total	2,850	1,291	464	3,284	7,889
	36.13	**16.36**	**5.88**	**41.63**	**100**

Table A.4: Intersectoral Transition Frequencies and Probabilities (Pij) (2007 to 2008)

	Sector 2008				
Sector 2007	**Agriculture**	**Manufacturing**	**Construction**	**Services**	**Total**
Agriculture	2,643	31	29	65	2,768
	95.48	**1.12**	**1.05**	**2.35**	**100**
Manufacturin	31	1,187	33	106	1,357
	2.28	**87.47**	**2.43**	**7.81**	**100**
Construction	16	24	418	52	510
	3.14	**4.71**	**81.96**	**10.2**	**100**
Services	49	93	59	3,336	3,537
	1.39	**2.63**	**1.67**	**94.32**	**100**
Total	2,739	1,335	539	3,559	8,172
	33.52	**16.34**	**6.6**	**43.55**	**100**

Table A.5: Intersectoral Transition Frequencies and Probabilities (Pij) (2008 to 2009)

	Sector 2009				
Sector 2008	**Agriculture**	**Manufacturing**	**Construction**	**Services**	**Total**
Agriculture	2,675	18	20	49	2,762
	96.85	**0.65**	**0.72**	**1.77**	**100**
Manufacturin	31	1,277	19	100	1,427
	2.17	**89.49**	**1.33**	**7.01**	**100**
Construction	45	13	456	46	560
	8.04	**2.32**	**81.43**	**8.21**	**100**
Services	60	58	31	3,795	3,944
	1.52	**1.47**	**0.79**	**96.22**	**100**
Total	2,811	1,366	526	3,990	8,693
	32.34	**15.71**	**6.05**	**45.9**	**100**

CHAPTER 5

THE FORMAL/INFORMAL EMPLOYMENT EARNINGS GAP

5.1. Introduction

Informal employment has traditionally been associated with inferior earnings, wage inequality and poverty in the mainstream literature. The conventional segmented markets theory explains this stylized fact by positing that labor informality is nothing but a survivalist alternative for those disadvantaged or rationed out of formal employment opportunities (Fields, 1975; Mazumdar, 1976; Bernabe, 2002; Perry et al., 2007). Therefore, in a segmented labor market informal workers are on average subject to lower remuneration than similar workers in the formal sector, where wages are set above market clearing prices for institutional or efficiency-wage reasons (Günther and Launov, 2006, p. 2). On the other hand, competitive labor markets theory argues that informal employment may equally well be voluntary based on private cost-benefit calculations of individuals and firms (Magnac, 1991; Pradhan and van Soest, 1995; Cohen and House, 1996; Marcoullier et al., 1997; Maloney, 1999; Saavedra and Chong, 1999; Gong and van Soest, 2002 in Henley et al., 2009, p. 1). In such a competitive market setting, formal/informal pay inequalities tend to disappear, especially when compensating differentials are accounted for. In contrast to these two polar views, a third view originated by Fields (1990), postulates a heterogeneous informal sector consisting of an *upper-tier* of those who are voluntarily informal; and a *lower-tier* of those who cannot afford to be unemployed but have no hope for a formal job (Cunningham and Maloney 2001; Fields 1990, 2005; Henley et al., 2009). In this setting, the commonly accepted assumption is that the upper-tier often corresponds to self-employment, whereas the lower-tier segment consists mostly of informal wage workers.

In this chapter, we aim to discuss the relevance of these theories to the Turkish labor market using the formal/informal employment earnings differentials. Indeed, there exists an ample empirical literature which purports to test the theory using estimation of formal/informal earnings gap. As put by Nguyen et al. (2011, p. 2): "Embedded in revealed preferences principle, and considering income as a proxy of individual utility, the approach assumes that if informal workers earn more than their formal counterparts, one could have good presumptions that they have deliberately chosen the informal sector". However, as with the theory, empirical evidence to date also seems to be mixed and inconclusive. Confirming the traditional segmented labor markets theory, most early studies find that formal sector workers are better rewarded for their earning-relevant characteristics than their informal sector counterparts (Mazumdar, 1981; Heckman and Hotz, 1986; Roberts, 1989; Pradhan and Van Soest, 1995; Tansel, 1997, 1999, 2001; Gong and Van Soest, 2002). In contrast, several recent studies report that wage differentials between formal and informal sector may not be a stylized fact. For example, Pratap and Quintin (2006) find no difference between formal and informal earnings in Argentina after controlling for individual and employer characteristics. Also, Tannuri-Pianto and Pianto (2002) show that at high quantiles of the earnings distribution, differences in returns to skills completely disappears in the Brazilian labor market.

Against this background, our motivation is to complement the existing literature by examining the earnings performances of formal and informal workers in Turkey. Given its demographic and economic dynamics, Turkey provides rich evidence for a large and heterogeneous informal labor market. A comprehensive diagnosis of pay differentials, its underlying factors and detailed decompositions across individual and job characteristics are of great importance in a developing country context. First and foremost, informal labor accounts for a substantial share of both urban and rural employment in most developing countries.[1] According to the Turkish Statistical Institute (TurkStat), the share of informal

[1] According to the International Labor Organization (ILO), informal employment accounts for one-half to three-quarters of nonagricultural employment in the developing countries: 48 percent in North Africa, 51 percent in Latin America, 65 percent in Asia, and 72 percent in Sub-Saharan Africa (ILO, 2002).

employment in the Turkish labor market stands high at 38.4 percent as of January 2012 (TurkStat, 2012). Moreover, TurkStat reports informality rate to be 82.8 for agricultural employment and 25.8 percent for the non-agricultural employment. Evidently, an improved understanding of the formal/informal pay gap is crucial for addressing its welfare, equity and poverty consequences. Second, earnings gap is commonly used to test for the existence of segmented versus competitive labor markets. Large differentials are viewed as an evidence for institutional rigidities in the labor markets, thereby suggesting need for policy action. Third, disentangling the dynamics of formal/informal pay gap across wage-employment versus self-employment and along various quantiles of the earnings distribution enables a multidimensional array of policy implications. In this fashion, one can address the heterogeneity within formal and informal sectors which is often an important issue in such earnings analyses.

Against this background, employing rich panel data and recently developed econometric methodologies, we aim to examine the following research questions: (1) Is there a formal/informal employment earnings gap in Turkey? (2) Is there an informal sector earnings penalty which implies the presence of segmentation in the Turkish labor market? (3) How does the earnings distribution across formal and informal sectors alter when employment is further broken down into wage-employment and self-employment, i.e. formal wage workers, formal self-employed, informal wage workers, informal self-employed? (4) What are the main individual, household and employment characteristics driving the formal/informal earnings gap? (5) To what extent can earnings differentials be explained by such observable characteristics and unobserved time-invariant individual heterogeneity?

The empirical analysis is based on micro level panel data from the TurkStat Income and Living Conditions Survey (SILC) for 2006-2009 period. Subsuming a rich set of information on household expenditure, income and assets, employment and living conditions, SILC is invaluable for implementing a comprehensive formal/informal earnings gap analysis for Turkey. Of particular interest for this

study are the income and labor market variables, such as employment type, registration to the social security institution and earnings. The data set also includes several other variables of personal, household and employment characteristics such as age, gender, education, household head status, household type, marital status, work experience, sector of economic activity, firm size and others which are commonly used for explaining the underlying dynamics of the earnings differentials. Moreover, the questionnaire allows us to distinguish not only between the formal/informal divide based on registration to social security institution, but also employed/non-employed status and wage/self-employed work. To the best of our knowledge, this study will be the first to use the SILC and its panel data set for analyzing formal/informal earnings gap.

The empirical analysis consists of examining the earnings differentials along multiple dimensions, disentangling at formal/informal employment, wage/self-employment and mean/quantiles of the earnings distribution. First, we estimate standard Mincer earnings regressions at the mean using ordinary least squares (OLS), controlling for a rich set of individual, household and job characteristics. However, as pointed out in several earlier studies, one must account for unobserved factors that are likely to affect the earnings and intrinsic heterogeneity within formal and informal sectors. To address the first one, the panel nature of the data enables us to apply fixed effects estimation, thereby account for the time-invariant unobservables that may affect pay differentials. For the latter, we rely on quantile regression (QR) estimation which allows for a distributional analysis of the pay gap at various points of the earnings distribution, thereby acknowledging potential structural heterogeneity within sectors.

The results reveal several important patterns. First, OLS in levels estimation of standard Mincer type earnings equations confirms the existence of an informal penalty, but also shows that almost half of this penalty can be explained by observable variables. Regarding formal/informal pay differences along wage/self-employment divide, formal-salaried workers are paid significantly higher than their informal counterparts. Moreover, self-employed are found to be subject to

lower remuneration compared to those who are salaried which confirms the heterogeneity within informal employment. The quantile regression (QR) results show that pay differentials are not uniform along the earnings distribution, i.e. informal penalty decreases with the earnings level. A particularly important finding is that, in contrast to the mainstream literature which views informal self-employed as the *upper-tier* and wage earners as the *lower-tier*, lower-tier informal employment corresponds to self-employment in the Turkish labor market. Finally, fixed effects regression estimation indicate that unobserved individual fixed effects when combined with controls for observable characteristics explain the pay differentials between formal and informal employment entirely.

The remainder of the paper is organized as follows: Section 5.2 provides a brief survey of empirical literature on earnings differentials in the formal/informal labor markets. Section 5.3 describes the data and definition of main variables used in the study along with a brief discussion of summary statistics. The econometric methodology and models are presented in Sections 5.4, and results are reported in Section 5.5. Finally, Section 5.6 provides a summary of the main findings and implications for policy.

5.2. Literature Survey

There are numerous attempts in the literature to test the formal/informal earnings gap. We consider those which we find relevant to our study. Carneiro and Henley (2001) consider the determinants of earnings and selection of workers into formal and informal employment, using the 1997 Brazilian household survey. In order to model selection, they adopt Lee (1978)'s three step procedure of simultaneous modeling of participation decision and earnings. Accordingly, they first estimate a reduced-form probit model of formal/informal sector participation choice and compute the selectivity correction term which they later incorporate into the Mincer earning equation. Lastly, they construct predicted earnings differentials using the earning function they estimated in stage two. The results imply that age, tenure, education and gender are significant determinants of earnings differentials.

In addition, they find the selectivity correction term to be statistically significant in the earnings equation, hence quantitatively important in modeling earnings differentials.

Gong and van Soest (2002) analyze wage differentials between formal and informal sectors using quarterly panel data from Mexico. They use a dynamic random effects wage regression to explain the wage formation and differentials, thereby controlling for possible selection bias due to unobserved time-invariant heterogeneity which affects both wages and sector choice. The study is the first such to consider wages and sector choice to be simultaneously determined in one dynamic panel data setting. Using Heckman (1981)'s Monte Carlo simulated maximum likelihood methodology, Gong and van Soest find that age significantly affects formal sector wage, but not the informal sector wage; returns to education are positive in both sectors though much higher in the formal sector; lagged labor market state has no effect on wages and that random effects are insignificant in the wage determination process.

For the same purpose of testing wage differentials across formal/informal divide in Argentina, Pratap and Quintin (2006) resort to propensity score matching (PSM) methodology to deal with the sample selection problem often inherent in such analyses. As with many other studies, they find a 25 percent formal wage premium using ordinary least squares estimation, controlling for individual and establishment characteristics. However, once they match observably similar workers using semi-parametric methods, Pratap and Quintin detect no evidence of a formal-sector wage premium; thereby reject the segmented formal/informal labor markets theory in Argentina. In particular, they employ three different matching techniques: caliper, nearest neighbor and Epanechnikov kernel.

Badaoui et al. (2008) re-examine the informal sector wage penalty considering the non-self-employed South African males. They emphasize the potential sample selection bias as the main challenge in the context of measuring formal-informal sector wage gap. In this regard, their analysis is structured in a way that comprises

several different estimations and comparison of their results. First, they run a simple ordinary least squares in levels on a standard Mincer wage equation, including only the informal sector dummy. The resulting 112 percent formal sector wage premium falls substantially to 53 percent, once human capital variables (i.e. gender, race, marital status, education level, occupation, job training) are introduced to the estimation. Furthermore, Badaoui et al. report that the wage gap falls to 37 percent when job characteristics (i.e. firm size, industry, supervision, urban area, part-time status, and tools) are also controlled. Following this line of research, they conclude that the observable human capital and job characteristics explain almost three quarters of average formal-informal sector wage gap. In order to account for possible overestimation of formal/informal earning differentials due to income taxation, Badaoui et al. adjust gross earnings for taxation, and find that informal-sector penalty falls by 48 percentage points when net earnings are considered. In order to purge for time-invariant factors that may affect both selection into informal sector and wages, Badaoui et al. take the first differences of the wage equation and estimate what is known as the difference-in difference (DID) statistics. The results depict a substantial fall in estimated wage penalty, conveying that time-invariant unobservables are indeed an important factor affecting the differentials. Another important contribution of the paper is the implementation of propensity score matching (PSM) method, in which one first identifies the probability of selection into the informal sector, and matches individuals accordingly, thereby creating comparable groups. Combining the PSM method with DID, Badaoui et al. obtain similar results.

Arias and Khamis (2008) apply the marginal treatment effect (MTE) methodology proposed by Heckman, Urzua, and Vytlacil (2006) to investigate the implications of competitive and segmentated labor market theories in the participation and earnings of formal-salaried, informal-salaried and self-employed workers in Argentina. The MTE method allows accounting for the selection bias and sorting on the gain, thereby comparing individuals indifferent at the margins of different sector choice and earnings. The empirical specification for participation/choice model is applied to three margins: formal-salaried work versus self-employment,

informal-salaried work versus self-employment and formal- versus informal-salaried work. Then, MTE estimations are ran for outcome/wage models to examine earnings differentials. The results provide evidence for both segmented and competitive informal labor markets views. For instance, formal-salaried and self-employed earnings do not exhibit any significant difference, once accounted for positive selection bias into formal-salaried work. Whereas, informal-salaried workers are found to experience significant earning penalties vis-a-vis their formal counterparts, even after controlling for the negative selection bias.

Alzúa (2008) investigates whether the Argentinian labor markets show any evidence of dualism, two different wage setting mechanisms and rationing in the access to primary sector jobs. Considering the period 1975-2001, Alzúa estimates endogenous switching wage regression models with unknown regimes using Maximum Likelihood Search algorithms. The estimations comprise two wage equations (i.e., one for the primary and one for the secondary sectors) and a switching equation which measures the probability of being in the primary sector. One of the main contributions of the study is that the estimations are conducted without assuming ex-ante sector attachment. The results support the existence of two different wage-setting mechanisms with different returns to education and experience, thereby provide credence to the dual labor markets theory.

Bargain and Kwenda (2009) examine the formal/informal wage gap in Brazil, Mexico and South Africa using large panels. The novelty of the study is twofold. First, usual measures of wage are adjusted for the taxes paid in the formal sector which may cause overestimation of the formal sector wage premium. Secondly, time-invariant unobserved heterogeneity is accounted for by using fixed-effects quantile regression estimation proposed by Koenker (2004) and Canay (2011). The sample is designed to include only urban male aged 15-65 who are not engaged in any form of education, who do not work as an unpaid family worker or a public worker; and observed at least twice consecutively. Females are excluded from the sample given the fact that most are engaged in unpaid family work and accounting for selection into labor market is not standard in quantile regressions.

The results reveal a similar distributional pattern of informal wage penalty across all countries. Namely, informal wage gap prevails mostly in lower earnings quantiles and disappears at the top quantiles.

Blunch (2011) contributes to the existing literature by examining the magnitude and determinants of formal-informal sector earnings gap in Serbia, specifically in the context of the recent international financial crisis. The empirical analysis is conducted and compared across four alternative measures of informality (firm registration, labor contract, benefit receipts and firm size) and two years of 2008 and 2009. Blunch first estimates the raw formal/informal sector earnings gap through Mincer wage regressions using ordinary least squares, then applies Blinder-Oaxaca decompositions to the observed earning gaps. The findings evince a large formal/informal sector earnings gap which somehow appears to decrease in the aftermath of the crisis. However, the gap does not exhibit a noticeable change when controlled for observable characteristics. The overall decomposition analysis shows that controlling for observable characteristics and returns to these characteristics reduces the earnings gap, but a substantial part of the gap still remains unexplained. Moreover, a detailed decomposition analysis indicates that many of the observable characteristics indeed contribute to the formal/informal sector pay differentials. Most notably, education and part-time status are found to be significantly associated with the earnings gap across all alternative informality specifications and time periods.

Falco et al. (2011) address the formal/informal employment earnings differentials using panel data from Ghana and Tanzania. First, they assume that movements in the labor market are exogenous, and implement Abowd et al. (1999) framework on a Mincer wage equation, controlling for a set of time-varying observables including experience, firm size, sector and ability. Next, they extend the analysis by relaxing the exogenous movement assumption, allowing for any possible endogeneity in sorting of workers across sectors. Following Arellano and Bond (1991) and Blundell and Bond (1998), they exploit panel nature of the data and use the lags of time-varying job-characteristics as instruments for the first

differenced and the system GMM estimators. Results depict a highly significant firm size effect and a private/public sector earning gap. Whereas, the instrumental variable (IV) estimate reveals an even higher size effect relative to that of OLS, suggesting that OLS may actually be underestimating the sector and firm size effects, as opposed to what is commonly believed.

Nguyen et al. (2011) examine the formal/informal earnings gap using individual level Vietnamese panel data. The analysis is particularly important, since it allows for heterogeneity within the formal and informal sectors by creating four groups: formal wage workers, informal wage workers, formal self-employed and informal self-employed. The econometric methodology is comprised of estimations of the standard Mincer earnings equations at the means and various conditional quantiles of the earnings distributions, and a fixed effects quantile regression which controls for individual unobserved characteristics. The results suggest that formal/informal wage gap depends highly on the employment type (wage employment versus self-employment) and the point in the earnings distribution.

Günther and Launov (2012) extend the existing literature by formulating a new econometric methodology which assumes a heterogeneous informal sector structure. The main purpose of their analysis is to test the segmented versus competitive formal/informal labor markets theory using cross-sectional data from Cote d'Ivoire. It follows that informal workers' earnings differ considerably according to their segment. Indeed, the results establish that informal sector is composed of two segments, one of which displays higher levels of earnings and returns to education and experience. Accounting for possible selection bias into employment, they conclude that dual structure of informal employment explains why existing empirical evidence on testing labor market segmentation are mixed, as they mostly assume a homogenous structure of informal sector employment.

The earnings gap between formal and informal sectors in Turkey was first investigated by Tansel (1999) using 1994 Turkish Household Expenditure Survey and social security coverage to identify informality. Tansel first examines how

individuals are selected into employment vs. non-participation in different sectors, then explores earnings gap between formal and informal sectors estimating selectivity corrected wage equations for each sector. Results indicate substantial wage differences between formal and informal wage earners for both men and women, thereby suggest existence of segmentation in the Turkish labor market. In a following study, Tansel (2001) extends the analysis by incorporating the self-employed workers into the model. She follows a similar methodology and examines the factors which determine employment sector choice and wage differentials for covered and uncovered wage earners and the self-employed using Oaxaca-Blinder decomposition of sector and gender. Tansel reports that for men covered wage earners are better-off compared to uncovered wage-earners and the self-employed. Whereas, for women wages in both sectors are similar. Moreover, male wage workers who are covered earn about twice of their female counterparts, whereas wages of uncovered male workers are found near parity with those of female workers. Overall, Tansel provides important evidence for the presence of segmentation and discrimination against women in the Turkish labor market.

In a recent study, Başkaya and Hulagu (2011) investigate the formal/informal sector wage gap in Turkey using cross section data from the TurkStat Household Labor Force Survey for 2005-2009 period. First, they estimate a standard Mincer wage regression which incorporates a formality status dummy and control for the effects of observable individual characteristics on each sector's wage distribution. The results indicate that formal workers earn significantly more than informal workers, even after controlling for observable characteristics. Başkaya and Hulagu further extend the analysis by estimating formal employment wage premium across different gender and age categories, where they find almost similar estimates across males/females and young/old. Then, they undertake a Propensity Score Matching (PSM) estimation which allows assessing the wage gap for workers with similar observable characteristics, thereby avoiding any potential bias of assuming formal and informal workers would have the same specification for their earning functions. The results also suggest significant wage gaps for all years under study.

5.3. Data and Summary Statistics

The data set used in this analysis is drawn from the Income and Living Conditions Survey (SILC), which has been conducted by the Turkish Statistical Institute (TurkStat) since 2006. The novel, nationally representative, rich, panel nature of the survey makes it unique for the aim and methodology of the study. It provides detailed information on the employment status, social security coverage, working hours, labor and other income, demographic characteristics, living conditions, job characteristics, and socioeconomic conditions of the subjects. The survey results are only recently released in micro data sets, thus to our knowledge have not yet been used in any other studies.

SILC is designed as a rotating panel in which the sample of households and corresponding individuals are traced annually for four years. Each year the survey is conducted for four subsamples. One subsample is removed and replaced by a new one in each year. Samples are selected and assigned survey weights so as to represent the non-institutionalized Turkish resident population. The analysis below focuses mainly on the years 2006, 2007, 2008 and 2009, since the micro data set for the following years are not yet released. The original cross-sectional samples consist of 30,186 individuals for 2006; 30,263 individuals for 2007; 31,121 individuals for 2008 and 32,539 individuals for 2009. For the specific aim and methodology of the study, we use the panel samples which are modified in a way to comprise only the labor force between 15-64 years of age who are present in at least two consecutive years. This selection leaves an unbalanced panel of 6154 individuals who are present for two years; 3,910 individuals for three years; and 1394 individuals for four years. Excluding cases with missing values for focal variables results in a sample of 23,668 observations. The empirical analysis is based on this pooled sample of two, three and four year panel observations.

The SILC questionnaire allows us to decompose employment into employed/non-employed, salaried/self-employed, formal/informal. Along these lines, we identify four different labor market states: formal-salaried, informal-salaried, formal self-

employed and informal self-employed. The questionnaire explicitly asks individuals whether they are registered at the Social Security Institution for their main job. Accordingly, employees working for a wage/salary are defined as formal-salaried if they are registered at the Social Security Institution for their current job, and informal-salaried if they are not. Own-account workers form the self-employed category, which is further divided into formal self-employed if registered at the Social Security Institution and informal self-employed if not. We exclude unpaid family workers whose earnings are difficult to measure and employers for whom the number of observations is insufficient to perform any reasonable analysis. By disaggregating the labor force into multiple subcategories, we are able to scrutinize the earnings gap across multiple dimensions.

As for the second important variable in the study, namely remuneration, SILC survey provides detailed information on individuals' annual income, months and hours worked on the main job. We construct our dependent variable, log real hourly earnings, first by calculating the hourly earnings then deflating it by 2006 Turkish Consumer Price Index (CPI). An advantage of SILC questionnaire is that wage earners and self-employed are asked different questions regarding their annual income, therefore measurement error in the analysis can be assumed as negligible. The reported earnings are net of taxes, thus we do not have to account for any overestimation that may stem from formal sector earnings being subject to tax deduction.

The data set also includes rich information on other variables that are associated with the level of earnings. For presentational brevity, we group these variables into three categories as individual, household and job characteristics. Accordingly, individual characteristics include gender, age, education; household characteristics include household size, marital status, whether the household have children, household head status, whether there is a formal worker in the household; and finally job characteristics comprise sector of economic activity, occupation, firm size and part/full-time status. A comprehensive list of variables used in the analysis and their definitions are provided in Appendix Table A.6.

Table 5.1 presents summary statistics of the main variables used in the analysis. The statistics are reported separately for the subsamples of formal and informal employment broken down into wage/self-employment. At first sight, the results clearly reveal a sizable earnings gap where earnings of formal workers are almost three times that of informal workers'. However, when the gap is decomposed into wage/self-employment, we observe that wage employees earn more on average than the self-employed. In other words, among each group of formal and informal employment, wage earners are better off compared to the self-employed workers.

The gender variable implies that male workers dominate employment in all types. Indeed, females constitute only one fifth of each group of employment, except for the informal wage work category where they are even more marginal at only four percent. In terms of age, we see that formal workers are on average younger than informal workers. Also notable, formal self-employed workers are mostly in the younger age groups, whereas informal self-employed workers tend to concentrate in the older age groups.

Education, confirming the conventional wisdom, exhibits a positive (negative) relationship with formal (informal) employment. On average, formal workers are better educated than informal workers; especially those in wage employment. More specifically, almost 50 percent of those who are formally employed have a high school or above degree, whereas it remains at only 13 percent for informal employees. Considering the wage/self-employment divide, the self-employed tend to have significantly lower levels of education compared to wage workers. As for experience, the results reveal that informal workers have on average more years of experience in the labor market, especially those who are informal self-employed.

In terms of the household characteristics, the summary statistics demonstrate that employment in all types are dominated by those married and have children. Being head of the household displays a stronger association with being an informal worker, whether wage or self-employed. Household size does not show any differentiable pattern across formal/informal or wage/self-employment jobs.

Proceeding with employment characteristics, an initial look at the sector summary statistics displays two notable patterns. First, agricultural employment mostly prevails as informal self-employment and second, manufacturing is predominantly a formal sector. Except for these two large sectors, distribution of formality is quite dispersed for the other sectors. Specifically, informal employment is larger in construction and trade, whereas formal workers are often concentrated in energy, public administration and education. Across the wage/self-employment divide, a few points are worth to mention. Formal employment in construction and agriculture sectors, though only minimal when compared to that in informal employment, prevail mostly in the form of self-employment. The distribution of formality across different occupations does not indicate any noticeable pattern. We also observe that informal employment is concentrated mostly in small firms; as compared to formal employment which is predominantly present in large firms. Finally, part-time job holders seem more likely to be informal.

Summary statistics, overall, indicate that formality/informality of jobs is associated with several observed and unobserved characteristics and is unlikely to be randomly assigned across different employment types. From an empirical standpoint, this fact constitutes the main challenge in estimating the existence of an earnings gap between the two sectors. In order to deal with such a potential sample selection bias, as it is called, we exploit the panel nature of the data to account for time-invariant unobservable effects and a rich set of individual and job characteristics as explanatory variables to control for the observable effects.

5.4. Empirical Methodology

As Badaoui et al. (2008, p. 693) state: “the problem of measuring any potential informal-sector wage penalty boils down to trying to answer the following counterfactual question: what wage would a person employed in the informal sector have if he or she was instead employed in a similar job in the formal sector?”. In other words, the main challenge in earnings gap analysis is to control possible sample selection bias which may result from either self-selection of

individuals into different employment types or non-participation based on own cost-benefit calculations, or some methodological selection of researchers. In order to refrain from a selection bias associated with selection into employment or non-participation, we restrict our sample into employed individuals, following recent studies which take the same approach such as Bargain and Kwenda (2010) and Badaoui et al. (2008). Once an individual is employed, however, there is another potential selection bias which involves selection into different types of employment. Indeed, there are several observable and unobservable factors which affect both selection decision and the level of earnings. As shown in the summary statistics, formal and informal workers are not only different in terms of remuneration, but also of personal and job characteristics. To this end, we take advantage of the rich information in the data set and control for several observable individual, household and job characteristics in the estimations. Whereas, for the unobservables, we rely on the panel nature of the data which enables isolating the time-invariant individual fixed effects, and thereby alleviates some of the concern regarding their influence on one's earnings. For gender-specific selection issues, we perform all estimations separately for male and female samples.

Following this line of approach, our empirical strategy consists of estimating the two different specifications of the formal/informal earnings gap, one at formal/informal divide and the other at the wage/self-employment divide, using OLS, quantile and fixed effects regressions. In this way, we are able to disentangle earnings differentials not only across formal/informal employment, but also across wage/self-employment and along different points of the earnings distribution.

The analysis is based on the seminal human capital earnings model of Mincer (1974), which can be traced back to the human capital theory of Becker (1964), Schultz (1960, 1961) and Mincer (1958, 1962). The model postulates that three main determinants of individual wages are education, work experience and its square. As with most studies, we extend the model by including a number of variables which are frequently used in the empirical literature to explain returns to

human capital characteristics and earnings of individuals. In order to estimate the formal/informal earnings gap, we specify the following Mincer earning models:

$$w_{it} = \alpha + \beta I_{it} + \gamma X_{it} + \varepsilon_{it} \quad (5.1)$$

where $i = \{1, \dots, N\}$ represents individual units and $t = \{1, \dots, T\}$ time periods. The dependent variable w_{it} refers to the log real hourly earnings; X_{it} denotes the set of individual, household and job characteristics of individual *i* observed at time *t*.[2] The different covariates include hours worked per week, experience, gender, age, education, household size, household head status, presence of children in the household, presence of a formal worker in the household, marital status, economic sector, occupation, firm size and part/full-time job status. The dummy variable I_{it} takes the value of one if individual is informal and zero otherwise. The estimated coefficient $\hat{\beta}$ will be used to test whether there exists a wage penalty/premium for informal employment vis-a-vis formal employment.

In the same manner, we then extend the analysis into wage/self-employment divide, in order to account for the heterogeneity within the formal and informal sectors. As defined in the previous section, we consider four employment types, and create a dummy variable for each as: FS_{it} for the formal-salaried; IS_{it} for the informal-salaried; FSE_{it} for the formal self-employed and ISE_{it} for the informal self-employed. For this empirical specification, we take the reverse approach and identify the informal-salaried as the base category. Along these lines, the extended model can be formulated as:

$$w_{it} = \alpha + \beta FS_{it} + \theta FSE_{it} + \delta ISE_{it} + \gamma X_{it} + \varepsilon_{it} \quad (5.2)$$

The estimated coefficients $\hat{\beta}$, $\hat{\theta}$ and $\hat{\delta}$ are interpreted as the conditional earnings gap between the informal-salaried workers and formal-salaried, formal self-employed, informal self-employed workers, respectively.

[2] For the definitions of the set of individual, household and job characteristics that are represented by Xit , see Appendix Table A.6.

First, standard earnings equations are estimated at the mean using OLS in levels on a pooled sample of workers over years. For this particular estimation, we specify the following wage equations:

$$w_{it} = \alpha + \beta I_{it} + \gamma X_{it} + \pi.time + \varepsilon_{it} \quad (5.3)$$

$$w_{it} = \alpha + \beta FS_{it} + \theta FSE_{it} + \delta ISE_{it} + \gamma X_{it} + \pi.time + \varepsilon_{it} \quad (5.4)$$

We start by estimating equations (5.3) and (5.4) using only the employment type dummies (i.e. formal or informal) and year dummies. A year dummy is intended to capture all effects that are common at a given point in time. However, as displayed in summary statistics, formality of jobs is related to several observable individual and job characteristics. Following this manner, we proceed the estimation by first including individual and household characteristics, then further extending it by introducing job characteristics. In this way, we aim to understand the extent to which observable characteristics explain the average earnings differentials across formal/informal employment. Moreover, we conduct the analysis not only for the total sample, but also for male only and female only samples in order to take into account of the gender dynamics.

Considering the fact that estimations at the mean might conceal important information, we rely on quantile regressions (Koenker and Bassett, 1978) to estimate earnings gap on the pooled sample. Quantile estimation, as put by Nguyen et al. (2011, p. 12), enables analyzing the earnings gap at different points of the earnings distribution. In this way, we aim to capture the heterogeneity in returns to observed characteristics along the conditional quantiles of the earnings distribution. We apply the following QR models which specify the ϱth conditional quantile of the log real hourly wage (w_{it}) distribution for individual *i* at time *t* as:

$$q_{\varrho}(w_{it}) = \alpha_{\varrho} + \beta_{\varrho} I_{it} + \gamma_{\varrho} X_{it} + \varepsilon_{it}, \quad \varrho \in (0,1) \quad (5.5)$$

$$q_{\varrho}(w_{it}) = \alpha_{\varrho} + \beta_{\varrho} FS_{it} + \theta_{\varrho} FSE_{it} + \delta_{\varrho} ISE_{it} + \gamma_{\varrho} X_{it} + \varepsilon_{it} \quad (5.6)$$

where the set of coefficients demonstrate the estimated returns to the covariates at the ϱth quantile of the log real hourly wage distribution. In particular, γ_ϱ in both QR specifications depict the effects of changes in the set of individual and job characteristics on the ϱ^{th} quantile of w_{it} . In model (5.5), β_ϱ measures the extent to which informal employment wage penalty/premium vis-à-vis formal employment wage remains unexplained at the various quantiles after controlling for individual and employment characteristics. Whereas, in model (6), β_ϱ, θ_ϱ and δ_ϱ refer to the earnings differentials at the ϱ^{th} quantile between informal-salaried workers and formal-salaried, formal self-employed and informal self-employed workers, respectively. The quantile regression coefficients in model (5.5) and (5.6) are straightforward to estimate by minimizing:

$$\min_{\beta,\gamma}\left[\sum_{i:w_{it}\geq\alpha+\beta I_{it}+\gamma X_{it}} \varrho\left|w_{it}-\alpha-\beta I_{it}-\gamma X_{it}\right| + \sum_{i:w_{it}<\alpha+\beta I_{it}+\gamma X_{it}} (1-\varrho)\left|w_{it}-\alpha-\beta I_{it}-\gamma X_{it}\right|\right] \tag{5.7}$$

Having controlled for several observable characteristics by using OLS and quantile regressions, we next exploit the panel nature of the data set and estimate Fixed Effects OLS regressions.[3] In this way, we are able to account for the time-invariant unobservable factors that may be obscuring more accurate measures of the earning differentials. The FE models can simply be written as:

$$w_{it} = \alpha_i + \beta I_{it} + \gamma X_{it} + \mu_i + \varepsilon_{it} \tag{5.8}$$

$$w_{it} = \alpha_i + \beta FS_{it} + \theta FSE_{it} + \delta ISE_{it} + \gamma X_{it} + \mu_i + \varepsilon_{it} \tag{5.9}$$

where $\mathrm{E}[\varepsilon_{it} \mid \mu_i, X_{it}, I_{it}] = 0$ for all individuals *i* and periods *t*. In this panel specification, μ_i denotes the time-invariant unobserved individual fixed effects

[3] The choice of Fixed Effects panel specification over Random Effects panel specification is made based on the Hausman Test,the results of which imply that Fixed Effects is more appropriate given our data.

and ε_{it} is normally i.i.d. stochastic term absorbing the measurement error. In model (5.8), the estimated coefficient $\hat{\beta}$ measures the conditional informal employment earnings premium/penalty vis-à-vis formal employment. As follows, coefficient estimates $\hat{\beta}, \hat{\theta}\ and\ \hat{\delta}$ in the model (5.9) can be interpreted as the conditional earnings gaps between informal-salaried workers and respectively, formal-salaried, formal self-employed and informal self-employed workers. For identification of these conditional earnings gaps, one should verify that there is a sufficient number of *movers* in the sample who change their employment states over time as well as *stayers* who remain in their state. Denoting the four alternative employment states FS, FSE, IS, ISE with $K = 1,2,3,4$ respectively, identification issue can be illustrated by a simple two-period example and four of the possible transitions :

$$E[w_{i2} - w_{i1}|K_{i1} = k, K_{i2} = k] = \Delta\ for\ k = 1,2,3,4 \tag{5.10}$$

$$E[w_{i2} - w_{i1}|K_{i1} = 1, K_{i2} = 3] = \Delta - \beta \tag{5.11}$$

$$E[w_{i2} - w_{i1}|K_{i1} = 2, K_{i2} = 3] = \Delta - \theta \tag{5.12}$$

$$E[w_{i2} - w_{i1}|K_{i1} = 1, K_{i2} = 4] = \Delta - \beta + \delta \tag{5.13}$$

$$\text{with } \Delta = \alpha_2 - \alpha_1 + (X_{i2} - X_{i1})\gamma \tag{5.14}$$

Equation (5.10) illustrates the changes in the earnings of *stayers*; equations (5.11) and (5.12), respectively, represent earnings differentials for workers moving from formal-salaried and formal self-employment into informal-salaried employment; and equation (5.13) shows the earnings changes for those moving from formal-salaried to informal self-employment. There are 16 possible permutations between states and we verify that the number of movers for each possible transition is sufficient for a valid use of the FE estimator by constructing transition matrices across possible employment states. As Bargain and Kwenda (2009, p. 8) state: "the FE estimator is consistent even if unobserved characteristics are correlated

with both selection and wages, as long as those characteristics are constant over time".

Before proceeding to estimation results, a few empirical points should be addressed. First and foremost, the issue of selection into employment is often accepted to be crucially important in such analysis. Indeed, as reported in Chapter 3, a substantial majority of the working age population in Turkey is classified as out of labor force. In order to alleviate potential sample selection bias, we restrict our sample to employed individuals as done in several other studies. Also taking account of the intrinsic differentials in male and female labor force participation rates, we run our estimations separately for male and female subsamples. And most importantly, we assume that the panel nature of the data which allows controlling for time-invariant unobservables affecting earnings also controls for selection. Finally, we define our dependent variable as the log real hourly earnings, i.e. real hourly wage rates for the wage workers and their equivalent for the self-employed.

5.5. Estimation Results

5.5.1. Pooled Ordinary Least Squares (OLS) Estimation of the Earnings Gap

Across Formal/Informal Employment

First, we estimate the formal/informal employment earnings gap using OLS in levels. We begin with a model which includes only the informal worker dummy and year dummies. The results, reported in the first column of Table 5.2, indicate a significant wage penalty for informal employment amounting to 53.9 percent. However, as we have mentioned previously, differences in earnings can be attributed to several observable and unobservable factors. Following this line of thought, we introduce a number of individual and household characteristics into the earnings model, and re-estimate the earnings gap. The results, given in the second column of Table 5.2, show that informal earnings penalty indeed decreases

considerably to 31.8 percent, implying that almost half of the earnings differences between formal and informal employment can be explained by the observable individual and household characteristics. Further extending the model by incorporating the job aspects, we detect a still significant but further lower informal earnings penalty of 21.5 percent. As Badaoui et al. (2008, p. 695) tell one may argue that some of these job characteristics are almost exclusively concurrent with informal sector, still the results of this exercise provides an important initial insight into the earnings differentials. In brief, OLS analysis confirms the existence of an informal sector earning penalty, but also shows that more than half of this pay difference is explainable by observable factors.

A gender breakdown of formal/informal earnings analysis is of crucial importance for several reasons, particularly in the context of Turkish labor market. First, the incidence of inactive women still stands as a major virtue of the Turkish labor market; thence distorts most aggregate labor market figures. As regards to informality, Chapter 4 reports that almost two thirds of those women who are employed are informal, while men exhibit a more or less equal distribution across informal and formal sectors. We have also shown that men are mostly employed in salaried positions and women in self-employment positions. In this analysis, we alleviate the empirical implications related to gender to some extent by excluding from the sample those in agricultural and unpaid family work where most female employment prevails. Nevertheless, we believe that a gender breakdown deserves an interest though without going into much detail.

When we re-estimate OLS in levels separately for male and female subsamples[4], we see that female workers suffer a substantially higher level of informal earnings penalty. More specifically, we find that the raw earnings penalty stands at -0.707 for female subsample, whereas it is quite lower at -0.505 for the male sample. When controlled for individual and household characteristics, despite decreases in magnitude, there still remains a considerable unexplained informal pay penalty of 25 and 45 percent for males and female workers, respectively. Put differently,

[4] See Table 5.2 colums (4) through (9).

women still appear to experience a wage penalty almost twice of those born by male workers. This finding suggests that returns to personal attributes constitute an important determinant of male workers' earning differentials, whereas for female workers they are less significant. This result may be interpreted as a reflection of discrimination against women. However, once all observable characteristics are introduced into the model, the negative informal premium for females also falls substantially, and becomes almost equal to that for male workers. This finding may be a reflection of the fact that women are mostly employed in jobs which are intrinsically informal in its nature.

Across Formal-Salaried, Informal-Salaried, Formal Self-employment and Informal Self-employment

A further breakdown of the formal/informal earnings gap including salaried/self-employment divide is expected to disseminate a more detailed portray given that both of these sectors embody sizable heterogeneity. For this analysis, however, we choose to identify informal-salaried workers as the base category and interpret the estimation results accordingly. Nevertheless, the implications of the results do not change.

Considering the raw earnings differentials, estimation results in the first three columns of Table 5.3 confirm the traditional theory that informal-salaried workers on average earn significantly less than those who are formally employed, whether salaried or self-employed. In particular, wage workers who are formally employed earn approximately 56 percent higher than those who are informally employed. Once controlled for personal attributes, as reported in column two of Table 5.3, formal premium decreases to around 30 percent, but still remains to be significant. With the introduction of job characteristics, formal/informal wage differentials exhibit a notable fall down to 18 percent. Overall, the results suggest a positive pay premium for formal wage workers compared to their informal counterparts. This evidence appears to be in line with the conventional wisdom that informal wage employment is on average subject to lower remuneration.

An interesting result can be observed for the earnings differentials of informal-salaried and formal self-employed. In particular, the size of earnings gap, which is around 32 percent, appears to remain robust against the inclusion of additional explanatory variables. Put differently, personal and job characteristics explain the pay differences to only a minimal extent. This finding is mostly likely the result of informal-salaried and formal self-employed jobs and workers being utterly different in nature, thereby rendering the earnings gap unexplained.

Also noteworthy is the comparison of the earnings gap between different types of informal employment. As per se, informal self-employed are observed to be significantly worse-off than informal-salaried workers but only when individual and job characteristics are introduced to the Mincer equation. Indeed, the initial raw estimate though having a negative is not significant, but becomes significant as observables are controlled for. To this end, one can claim that informal-salaried workers on average have better observable characteristics than their self-employed counterparts, and once returns to these attributes are considered they are in fact significantly lower paid.

We next replicated our analysis separately for the male and female subsamples. We find that the picture somewhat alters but the changes are mostly limited to earning differentials within informal employment itself. In particular, pay gap between informal wage and self-employment is almost insignificant for male workers. Whereas for the female subsample, the coefficient of informal self-employment is highly significantly negative under all specifications of the model. In particular, informal self-employed female workers are paid around 40 percent less than their salaried counterparts. It is also interesting to note that the earnings penalty increases sharply to 70 percent if individual and household effects are controlled. This finding implies the monetary returns to similar personal attributes being considerably lower in informal self-employment compared to informal wage employment. The penalty falls back to 40 percent when job attributes are also incorporated into the model. Overall, these results indicate that females are more prone to hold lower-tier informal jobs which have inferior earnings in

contrast to males clustering at higher-tier informal jobs where pay differentials between wage and self-employment are insignificant.

5.5.2. Pooled Quantile Regression (QR) Estimation of the Earnings Gap

Across Formal/Informal Employment

Estimations at the mean are generally insufficient when covariates affect not only the location of the conditional distribution of wages, but also its dispersion. Therefore, one has to go beyond a simple mean estimation model and apply quantile regression for a more comprehensive and informative analysis. Along these lines, we extend the empirical analysis by estimating conditional quantile regression (QR), as given in equations (5.5) and (5.6), on the pooled sample. This exercise allows for tracking the earnings gap along various conditional quantiles of the earnings distribution, thereby unveil more complex dynamics pertained to pay differentials.

The quantile regression estimates, reported in Table 5.4, depict that informal employment earnings penalty is larger at lower quantiles but decreases significantly in higher quantiles, after controlling for several observable individual and job characteristics. In particular, the coefficient of informal variable which is -0.593 in the 5^{th} quantile gradually falls as we move along the distribution and eventually emerges as insignificant around 90^{th} quantile. More interestingly, the informal earnings gap becomes significantly positive at the top quantile. The large earnings penalty in the lower quantiles may be thought of as affirming the traditional segmentation theory which views informal employment as an inferior state. However, confirming the basic premise of a heterogeneous informal sector, the earnings gap is in fact not uniform along the distribution and turns into a premium at the top. The last finding reveals that upper-tier informal jobs which are voluntarily chosen by workers given their preferences, personal attributes and competing earning prospects are concentrated in the upper income levels. In order to further scrutinize the underlying dynamics of these findings, we will re-

estimate the earnings gap considering not only formal/informal but also wage/self-employment divide in the following section.

The results of the gender decomposition of the QR are qualitatively similar to the analysis of the entire sample and changes are quantitatively small. The estimation results for male and female subsamples are presented respectively, in Tables 5.5 and 5.6. More specifically, both female and male informal workers are found to experience significant earnings penalties at the lower quantiles of the earnings distribution, whose magnitude is only slightly higher for female workers. One also notes that formal/informal earnings differences for female workers become insignificant at the 75th quantile and display a significantly positive sign at the top quantile. Whereas for male workers, the informal sector penalty disappears at the 90th quantile and is statistically insignificant afterwards. This is a particularly interesting result since it shows that upper-tier informal jobs are considerably and in relative terms more rewarding for female workers.

Across Formal-Salaried, Informal-Salaried, Formal Self-employment and Informal Self-employment

A further breakdown of the formal/informal earnings gap by incorporating wage/self-employment dimension empowers a more thorough examination. Several theoretical and empirical studies address the issue of intrinsic heterogeneity within formal and informal sectors, and suggest that more accurate and informative analysis requires it to be acknowledged. In this section, we report and discuss the conditional QR estimation results of the Mincer wage function where informal-salaried workers are taken as the reference category. The first row in Table 5.7 confirms the conventional wisdom that within salaried employment, formal workers have significantly higher earnings than informal workers, given identical personal and establishment characteristics. However, this formal sector premium for salary workers decreases gradually with the earnings level, and eventually becomes negative at the top. The results point to the dual nature of informal sector, with upper-tier jobs carrying an earnings premium that may

compensate the benefits of formal wage work and lower-tier jobs being largely penalized. One may also claim that formal-salaried workers have better unobservable skills compared to their informal counterparts considering the fact that results are obtained by controlling for only observable characteristics. To further investigate this, we will next apply the fixed effects estimation to earnings gap which allows for controlling unobservable heterogeneity.

Turning to earnings differentials between formal self-employed and informal-salaried workers, as reported in the second row of Table 5.7, we detect a significantly positive gap at all quantiles. Put differently, formal self-employed are better-off along the whole distribution, though size of their earnings premium falls with increased income levels. This finding may be due to either better unobserved skills of formal self-employed workers or pure intrinsic premium in the formal self-employment.

A comparison which deserves particular interest is the pay gap between informal salary vis-a-vis self-employed workers. The QR estimates in the third row of Table 5.7 demonstrate that informal self-employed suffer a significant earnings penalty but only at the lower end of the distribution of the 5^{th}, 10^{th} and 25^{th} quantiles. Afterwards, the gap becomes insignificant for the upper half. Overall, the evidence clearly demonstrates the heterogeneity within informal sector; where the lower end corresponds to segmented and upper quantiles to competitive labor markets theories. In contrast to the mainstream literature which views informal self-employed as the upper-tier and wage earners as the lower-tier, our findings suggest that lower-tier informal employment corresponds to self-employment in the Turkish labor market.

When the analysis is replicated for male and female subsamples separately, we detect a number of discernible patterns. The estimation results for male and female only subsamples are provided in Tables 5.8 and 5.9, respectively. For male workers, the significantly positive formal wage premium decreases with earnings level and disappears at the 90^{th} quantile. Formal self-employed male workers are

associated with relatively higher earnings compared to informal-salaried throughout the entire distribution. For the lower end, formal self-employment premium amounts to 40 percent, but halves to approximately 20 percent for 25th and higher quantiles. The earnings gap between informal-salaried and informal self-employed reveals a somewhat ambivalent picture, as reported in the third row of Table 5.8. Only at the lowest quantile, male informal self-employed suffer a 10 percent penalty compared to male informal wage workers. This result confirms the segmentation theory and our previous finding that self-employed form the lower-tier informal employment. For higher quantiles, however, this earnings penalty disappears and becomes significantly positive at the 75th quantile. The implications are twofold: informal self-employed workers at the upper end of the earnings distribution may have better unobserved skills and thus earn higher monetary returns, or informal self-employment jobs at the upper quantiles may have better earnings prospects than informal-salaried positions by their nature.

The distributional pattern of earnings gap becomes even more discernible when the analysis is limited to female subsample. The first thing to notice in Table 5.9 is that the formal wage premium at the lower half of the earnings distribution completely vanishes at the upper half. This result provides evidence for the presence of labor market segmentation at the lower end, but also shows that this may not apply to workers at the top. Indeed, the results show that the 48 percent formal-salaried wage premium at the lowest quantile turns into a 42 percent penalty at the top. Comparing with the corresponding figure for male workers which is only 8 percent, this result is particularly intriguing. One can argue that this may be solely due to better unobserved skills of informal-salaried individuals at the 95th quantile which are rewarded with higher pay. However, such a result is often taken to be an evidence of heterogeneity in the informal sector, lower-tier being subject to worse pay conditions in contrast to upper-tier having better remuneration. Turning to the earnings gap between formal self-employed and informal-salaried female workers, we do not observe any pronounced pattern as was found in the male subsample. This is most likely due to female formal self-employment being almost negligible in the Turkish labor market. Last but not

least, we observe that informal self-employed female workers are consistently worse-off than their salaried counterparts throughout the earnings distribution. In contrast to the results for total and male only samples, the coefficient of informal self-employment does not become positive at the top quantiles. This finding is also of particular importance as it clearly demonstrates that informal self-employment constitutes the lower end for female workers, where remuneration is always worse than salary work.

5.5.3. Fixed Effects Estimation of Earnings Gap

Across Formal/Informal Employment

Time-invariant unobserved individual heterogeneity is accepted to play an important role in explaining the formal/informal earnings gaps, even after controlling for a rich set of observable individual- and job-level characteristics. El Badaoui et al. (2008, p. 697) claim that there are often several unobservable factors which affect both selection decision into the formal/informal employment and wages, thereby if not taken into account will lead to biased estimates of the earning gaps. Similarly, Abowd et al. (1999) report that unobservable worker characteristics are by far the most important factor in determining earnings. Following this line of thinking, we exploit the panel nature of the data and rely on fixed effects estimation to purge such unobservables, thereby isolate their effect on earnings differences. The estimation results for the two model specifications, equations (5.8) and (5.9), are provided in Tables 5.10 and 5.11, respectively.

Overall the results are quite remarkable: when accounted for time-invariant unobservables, formal/informal earnings differentials are not found as statistically significant. Put differently, unobserved individual fixed effects when combined with controls for observable personal, household and job characteristics explain pay differences entirely. By examining male workers, however, one finds evidence that there still remains a 10 percent informal penalty that is statistically significant at 10 percent. Female workers do not experience any statistically

significant earning differential across formal/informal employment after controlling for observable and unobservable factors which are likely to determine the level of earnings. The implications of results are threefold. Segmentation may not be a stylized fact of the Turkish labor market as commonly believed once unobserved individual effects are accounted for. Secondly, formal sector workers on average have better unobserved characteristics, as well as better observable attributes. Once these factors are accounted for, the informal employment earning penalty entirely disappears.

Across Formal-Salaried, Informal-Salaried, Formal Self-employment and Informal Self-employment

When replicated for the second Mincer specification, equation (5.9), results are qualitatively similar to previous findings. Specifically, the fixed effects estimation displays that there is no statistically significant earnings gap between formal- and informal-salaried workers. Whereas, for male wage earners, we find a 10 percent formal premium. Though not statistically significant, the coefficient of formal-salaried emerges as negative for female wage workers, implying a formal penalty. Formal self-employed workers appear to be significantly better-off than informal-salaried, even after controlling for individual fixed effects. However, further breakdown of the sample show that this finding loses relevance when sample is restricted to females only. As for within informal employment earnings differentials, we find no statistically significant gap once we control for unobservable factors using fixed effects regression. Again for the females, however, it is statistically significantly negative, implying the existence of an earning penalty for the informal self-employed when compared to their salaried counterparts.

5.6. Concluding Remarks

In this chapter, we examine the formal/informal sector earnings differentials in the Turkish labor market in terms of its prevalence, magnitude and underlying

dynamics. For this purpose, we employ detailed econometric methodologies and a novel panel data set drawn from the 2006-2009 Income and Living Conditions Survey (SILC) which subsumes a rich set of information on individual, household and employment characteristics; income and labor market state. In particular, we test if there is evidence of traditional segmented labor markets theory which postulates that informal workers are typically subject to lower remuneration than similar workers in the formal sector. Moreover, we address the heterogeneity within formal and informal employment by further decomposing the analysis into wage and self-employment. The empirical analysis consists of examining the earnings gap along multiple dimensions, disentangling at formal/informal sector, wage/self-employment, and mean/quantiles of the earnings distribution. All of the analyses are also replicated for male and female subsamples separately.

First, we estimate standard Mincer earnings equations at the mean using OLS on a pooled sample of workers. Across formal/informal divide, the results indicate a significant raw penalty for informal workers, which tends to decrease as other earnings-related variables (i.e. individual, household and job attributes) are included in the regression. Overall, the analysis confirms the existence of an informal penalty, but also shows that almost half of this penalty can be explained by observable variables. We also find that the unexplained informal penalty for female workers is twice of that for the male workers when only individual characteristics are controlled for. This finding demonstrates that returns to personal attributes are comparatively lower for female workers, hence imply the presence of discrimination against women. However, once job variables are also introduced to the model, informal penalty for female workers is at parity with that for male workers. Turning to formal/informal pay differences along wage/self-employment divide, the results are in line with the traditional theory that formal-salaried workers are paid significantly higher than their informal counterparts. Confirming the heterogeneity within informal employment, we find that self-employed are often subject to lower remuneration compared to those who are salaried.

Acknowledging the fact that earnings at the mean are not so informative, we next estimate quantile regressions on the pooled sample. The results show that pay differentials are not uniform along the earnings distribution. More specifically, we find that informal penalty decreases with the earnings level, i.e., it is significant at the lower quantiles but either becomes insignificant or even turns into a premium at the top. The results, overall, confirm the basic premise of a heterogeneous informal sector comprising of upper-tier jobs carrying a significant premium that may compensate the benefits of formal wage work and lower-tier jobs being largely penalized. An important finding revealed by the distributional analysis is that, in contrast to the mainstream literature which views informal self-employed as the upper-tier and wage earners as the lower-tier, lower-tier informal employment indeed corresponds to self-employment in the Turkish labor market. The distributional pattern of earnings gap becomes even more discernible when the analysis is limited to female workers. Most notably, the 48 percent formal-salaried wage premium vis-a-vis informal-salaried at the lowest quantile turns into a 42 percent penalty at the top. This result also affirms the dual nature of informal sector.

Finally, we estimate fixed effects regressions exploiting the panel nature of the data in order to take into account of time-invariant unobservable characteristics that are also important determinants of earnings levels. The results show that unobserved individual fixed effects when combined with controls for observable individual and employment characteristics explain the pay differentials between formal and informal employment entirely. The implication is particularly remarkable, that formal/informal segmentation may not be a stylized fact of the Turkish labor market as previously thought. Indeed, further breakdown by gender also displays only a slightly significant informal wage penalty for male workers and no statistically significant informal pay gap for female workers. When FE model is extended to incorporate salaried versus self-employment divide, we observe three noticeable patterns. First, there is no evidence of a statistically significant earnings gap between formal and informal wage earners, but only for the male sample which displays a slightly significant 10 percent formal premium.

Second, formal self-employed workers display earnings premiums of 15 and 21 percents, respectively for the total and male only samples. As for within informal employment, earnings differentials in favor of salaried work against self-employment ceases to exist when one accounts for time-invariant unobservables. The 40 percent earnings penalty for female informal self-employed, however, confirms the prior evidence that self-employment rather corresponds to lower-tier informal employment even after controlling for observable and unobservable factors.

To conclude, the analysis provides a comprehensive and detailed diagnosis of formal/informal pay differentials in the Turkish labor market. Using a panel data set and several econometric approaches, we indeed detect an informal sector penalty, but once controlled for observable and unobservable effects the gap disappears entirely.

Table 5.1: Summary Statistics

	Formal Employment						Informal Employment					
	All employment		Wage Workers		Self-employed		All employmen		Wage Workers		Self-employed	
Variable	*Mean*	*Sd*	*Mean*	*Sd*	*Mean*	*Sd*	*Mean*	*Sd*	*Mean*	*Sd*	*Mean*	*Sd*
Log hourly earnings	0.97	0.71	1.03	0.67	0.44	0.72	0.31	0.85	0.67	0.83	0.17	0.95
Hours worked (pw)	53.01	14.00	51.63	13.01	54.88	17.41	52.99	17.92	60.93	16.56	50.94	18.25
Gender												
Male	0.82	0.38	0.80	0.40	0.81	0.39	0.81	0.39	0.96	0.20	0.82	0.39
Female	0.18	0.38	0.20	0.40	0.19	0.39	0.19	0.39	0.04	0.20	0.18	0.39
Age												
Age15to24	0.11	0.32	0.13	0.34	0.25	0.43	0.14	0.35	0.03	0.16	0.03	0.16
Age25to34	0.36	0.48	0.39	0.49	0.28	0.45	0.22	0.42	0.23	0.42	0.17	0.38
Age35to44	0.34	0.47	0.33	0.47	0.24	0.43	0.25	0.44	0.36	0.48	0.27	0.44
Age45to54	0.16	0.37	0.14	0.35	0.17	0.38	0.24	0.43	0.29	0.45	0.32	0.47
Age55to64	0.02	0.15	0.01	0.11	0.06	0.24	0.14	0.34	0.09	0.29	0.22	0.41
Education												
Illiterate	0.01	0.08	0.00	0.07	0.06	0.23	0.08	0.28	0.02	0.14	0.11	0.31
Nograde	0.01	0.12	0.01	0.11	0.07	0.26	0.08	0.28	0.03	0.17	0.10	0.29
Primary	0.34	0.47	0.29	0.46	0.53	0.50	0.57	0.50	0.61	0.49	0.61	0.49
Secondary	0.14	0.34	0.14	0.35	0.19	0.39	0.14	0.34	0.11	0.32	0.09	0.28
High	0.14	0.35	0.15	0.36	0.08	0.27	0.06	0.24	0.10	0.31	0.04	0.20
Vocational	0.14	0.35	0.15	0.36	0.05	0.23	0.05	0.21	0.08	0.26	0.04	0.19
University	0.22	0.42	0.25	0.43	0.03	0.17	0.02	0.15	0.05	0.21	0.02	0.13
Experience	15.15	9.62	13.93	8.90	15.00	11.20	20.06	12.65	22.12	10.58	25.54	11.82
Household												
Single	0.20	0.40	0.22	0.42	0.28	0.45	0.19	0.40	0.06	0.24	0.10	0.29
Married	0.80	0.40	0.78	0.42	0.72	0.45	0.81	0.40	0.94	0.24	0.90	0.29
nochild	0.24	0.43	0.25	0.43	0.20	0.40	0.25	0.43	0.23	0.42	0.29	0.45
child	0.76	0.43	0.75	0.43	0.79	0.40	0.75	0.43	0.77	0.42	0.71	0.46
hhead	0.66	0.47	0.63	0.48	0.56	0.50	0.66	0.47	0.83	0.37	0.77	0.42
hhsize	4.26	1.74	4.18	1.65	5.15	2.46	5.08	2.49	4.72	2.11	5.00	2.53
otherf	1.00	0.00	1.00	0.00	0.23	0.42	0.19	0.40	1.00	0.00	0.16	0.37
Sector												
Agriculture	0.07	0.25	0.01	0.10	0.13	0.34	0.39	0.49	0.40	0.49	0.66	0.47
Mining	0.01	0.09	0.01	0.10	0.01	0.07	0.00	0.06	0.00	0.00	0.00	0.03
Manufacturing	0.26	0.44	0.29	0.45	0.18	0.39	0.12	0.32	0.07	0.26	0.05	0.21
Energy	0.01	0.10	0.01	0.11	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00
Construction	0.05	0.21	0.05	0.22	0.21	0.41	0.12	0.32	0.02	0.14	0.02	0.15
Trade	0.15	0.36	0.12	0.33	0.14	0.34	0.14	0.35	0.30	0.46	0.15	0.35
Hotels	0.04	0.19	0.04	0.19	0.07	0.26	0.05	0.21	0.05	0.21	0.02	0.14
Transportation	0.06	0.23	0.05	0.22	0.07	0.26	0.06	0.25	0.09	0.29	0.05	0.23
Finances	0.07	0.26	0.08	0.28	0.03	0.17	0.02	0.14	0.03	0.16	0.01	0.10
PublicAdmin.	0.11	0.32	0.13	0.34	0.03	0.18	0.02	0.13	0.00	0.00	0.00	0.00
Education	0.09	0.28	0.10	0.30	0.01	0.10	0.01	0.08	0.00	0.03	0.00	0.03
Health	0.05	0.21	0.06	0.23	0.01	0.08	0.00	0.07	0.01	0.07	0.00	0.04
OtherServices	0.04	0.19	0.04	0.20	0.11	0.31	0.07	0.26	0.03	0.16	0.03	0.18
Occupation												
Legislators	0.08	0.28	0.05	0.23	0.03	0.17	0.06	0.25	0.26	0.44	0.10	0.30
Professionals	0.13	0.33	0.14	0.35	0.01	0.12	0.01	0.10	0.03	0.16	0.01	0.08
Technicians	0.10	0.29	0.11	0.31	0.02	0.15	0.02	0.14	0.02	0.13	0.01	0.12
Clerks	0.09	0.29	0.11	0.31	0.03	0.16	0.01	0.12	0.00	0.03	0.00	0.01
ServiceWorkers	0.12	0.33	0.13	0.34	0.18	0.38	0.10	0.30	0.04	0.20	0.02	0.15
SkilledAgricultural	0.06	0.24	0.00	0.07	0.01	0.11	0.32	0.47	0.40	0.49	0.66	0.47
Craftsmen	0.14	0.35	0.15	0.36	0.29	0.45	0.19	0.39	0.12	0.33	0.08	0.27
PlantOperators	0.15	0.36	0.16	0.37	0.12	0.32	0.09	0.28	0.11	0.31	0.06	0.23
ElementaryOper	0.12	0.32	0.13	0.34	0.31	0.46	0.19	0.39	0.02	0.14	0.06	0.24
Firm Size												
small	0.34	0.47	0.22	0.42	0.74	0.44	0.86	0.34	1.00	0.03	1.00	0.03
medium	0.25	0.44	0.30	0.46	0.20	0.40	0.10	0.30	0.00	0.02	0.00	0.02
large	0.41	0.49	0.48	0.50	0.06	0.24	0.03	0.18	0.00	0.00	0.00	0.02
Job Type												
fulltime	0.98	0.13	0.99	0.12	0.89	0.32	0.87	0.33	0.97	0.17	0.86	0.35
parttime	0.02	0.12	0.01	0.11	0.10	0.30	0.12	0.32	0.03	0.17	0.14	0.34
Year												
2006	0.17	0.38	0.17	0.38	0.21	0.41	0.21	0.41	0.17	0.38	0.21	0.40
2007	0.28	0.45	0.28	0.45	0.31	0.46	0.31	0.46	0.27	0.45	0.30	0.46
2008	0.32	0.47	0.32	0.47	0.29	0.45	0.28	0.45	0.33	0.47	0.28	0.45
2009	0.22	0.42	0.22	0.42	0.19	0.39	0.20	0.40	0.23	0.42	0.22	0.41
#observations	17397		14804		6350		12217		2593		5867	

Table 5.2: Pooled OLS Mincer Earnings Regressions (Across Formal/Informal Employment)

	ALL			MALE			FEMALE		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS
Informal	-0.539***	-0.318***	-0.215***	-0.505***	-0.256***	-0.196***	-0.707***	-0.456***	-0.181***
Hourspw		-0.0158***	-0.0158***		-0.0166***	-0.0155***		-0.0139***	-0.0190***
Exper		0.0268***	0.0237***		0.0284***	0.0265***		0.0184**	0.0162**
Expersq		-0.000537***	-0.000502***		-0.000584***	-0.000562***		-0.000375	-0.000358
Female		-0.0850***	-0.0846***		0	0		0	0
age25to44		0.0227	0.0207		0.00399	-0.00140		0.0992*	0.0875*
age45to64		0.0276	0.0152		0.00978	-0.00917		0.139	0.0903
Illiterate		-0.170**	-0.119*		-0.173***	-0.102*		-0.130	-0.0519
None		-0.0752*	-0.0712*		-0.0749*	-0.0674*		0.00164	-0.000912
Secondary		0.0774***	0.0531***		0.0758***	0.0593***		0.0852	0.0953
High		0.257***	0.180***		0.251***	0.188***		0.288***	0.206***
Vocational		0.279***	0.188***		0.269***	0.192***		0.322***	0.192***
University		0.679***	0.433***		0.640***	0.432***		0.745***	0.420***
student		-0.235	-0.537		-0.304	-0.541		0	0
Married		0.0377*	0.0260		0.0704***	0.0576**		-0.0301	-0.0377
hhead		0.116***	0.102***		0.104***	0.0907***		0.105*	0.0667
child		0.0257	0.0360**		0.0174	0.0276		0.111**	0.0764*
hhsize		-0.00651*	-0.00924**		-0.00611*	-0.00719*		-0.0375***	-0.0295**
otherf		-0.0256	-0.00425		0.0113	0.0152		-0.00342	0.00478
Mining			0.0352			0.00225			0.120
Energy			0.268***			0.274***			-0.664
Construction			0.209***			0.136***			0.120
Trade			0.0644***			0.0123			0.110*
Hotels			0.0431			-0.0245			0.227**
Transportation			0.142***			0.1000***			0.244**
Finances			0.00251			-0.0583*			0.102*
PublicAdministration			0.0589**			0.0304			0.118*
Education			-0.0579*			-0.105***			-0.0478
Health			0.119***			0.105**			0.122*
OtherServices			0.0512*			-0.0642*			0.244***
Legislators			-0.0492			-0.0738*			0.123
Technicians			-0.203***			-0.211***			-0.216***
Clerks			-0.328***			-0.334***			-0.359***
ServiceWorkers			-0.349***			-0.359***			-0.323***
SkilledAgricultural			-0.373***			-0.359***			-0.350***
Craftsmen			-0.373***			-0.339***			-0.913***
PlantOperators			-0.325***			-0.350***			-0.261***
ElementaryOperations			-0.427***			-0.459***			-0.344***
medium			0.122***			0.0833***			0.284***
large			0.259***			0.230***			0.379***
y2007	-0.00877	0.00263	0.00501	-0.00178	0.00886	0.0101	-0.0471	-0.0298	-0.00884
y2008	-0.0128	-0.00351	0.00340	-0.00604	0.00649	0.0121	-0.0499	-0.0455	-0.0215
y2009	0.0446**	0.0300*	0.0418***	0.0472**	0.0391**	0.0497***	0.0219	-0.00329	0.0129
_cons	1.003***	1.280***	1.408***	0.984***	1.271***	1.503***	1.091***	1.219***	1.037**
N	23668	23667	23656	19414	19413	19403	4254	4254	4253

Source: Own calculations based on SILC 2006-2009 (Panel observations only).
Notes : [1]For variable definitions, see Appendix Table A.6. [2]Dependent variable: Log real hourly earnings
[3] Independent variable base category: Formal, Male, Age15to24, Primary education, Not student, Single household, Not household head, No other formal household member, Manufacturing sector, Professional occupation, Small firm, Year 2006.
Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table 5.3: Pooled OLS Mincer Earnings Regressions (Across Formal/Informal and Salaried/Self-employment)

	ALL			MALE			FEMALE		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS	Pooled OLS
Formal Salaried	0.561***	0.299***	0.183***	0.547***	0.256***	0.180***	0.619***	0.357***	0.142**
Formal Self-employed	0.323***	0.328***	0.249***	0.321***	0.306***	0.261***	0.328**	0.331**	0.133
Informal Self-employed	-0.00124	-0.0704**	-0.0899**	0.0633*	0.0303	0.0162	-0.432***	-0.705***	-0.451***
Hourspw		-0.0158***	-0.0159***		-0.0168***	-0.0156***		-0.0158***	-0.0197***
Exper		0.0268***	0.0236***		0.0285***	0.0265***		0.0182**	0.0165**
Expersq		-0.000533***	-0.000498***		-0.000590***	-0.000564***		-0.000324	-0.000345
Female		-0.0833***	-0.0838***						
age25to44		0.0270	0.0256		0.000535	-0.00268		0.134**	0.108**
age45to64		0.0315	0.0187		0.00445	-0.0120		0.176*	0.123
Illiterate		-0.168**	-0.116*		-0.174***	-0.104*		-0.0565	-0.0189
None		-0.0764*	-0.0733*		-0.0739*	-0.0688*		0.00579	0.00402
Secondary		0.0778***	0.0535***		0.0770***	0.0603***		0.111	0.105
High		0.258***	0.179***		0.251***	0.188***		0.301***	0.214***
Vocational		0.281***	0.189***		0.271***	0.193***		0.326***	0.196***
University		0.681***	0.434***		0.642***	0.436***		0.730***	0.414***
student		-0.246	-0.555		-0.312	-0.562		0	0
Married		0.0378*	0.0260		0.0703***	0.0570**		-0.0232	-0.0339
hhead		0.118***	0.104***		0.103***	0.0902***		0.123**	0.0824*
child		0.0241	0.0339*		0.0184	0.0277		0.0944**	0.0702*
hhsize		-0.00649*	-0.00926**		-0.00643*	-0.00759*		-0.0341***	-0.0278**
otherf		-0.0306	-0.0117		0.0132	0.0159		-0.0629	-0.0323
Mining			0.0360			0.00432			0.112
Energy			0.270***			0.275***			-0.700
Construction			0.199***			0.137***			0.107
Trade			0.0678***			0.00547			0.111*
Hotels			0.0410			-0.0275			0.206**
Transportation			0.140***			0.0911***			0.226**
Finances			0.00285			-0.0610*			0.0874
PublicAdministration			0.0577**			0.0312			0.0992
Education			-0.0578*			-0.103***			-0.0761
Health			0.119***			0.103**			0.105*
OtherServices			0.0484*			-0.0634*			0.195***
Legislators			-0.0514			-0.0879**			0.156*
Technicians			-0.201***			-0.207***			-0.219***
Clerks			-0.327***			-0.327***			-0.374***
ServiceWorkers			-0.353***			-0.352***			-0.348***
SkilledAgricultural			-0.376***			-0.352***			-0.0299
Craftsmen			-0.376***			-0.338***			-0.871***
PlantOperators			-0.326***			-0.348***			-0.287***
ElementaryOperations			-0.428***			-0.455***			-0.378***
medium			0.127***			0.0992***			0.249***
large			0.268***			0.247***			0.346***
y2007	-0.00790	0.00279	0.00538	-0.00114	0.00886	0.00998	-0.0411	-0.0243	-0.00655
y2008	-0.0110	-0.00281	0.00465	-0.00507	0.00608	0.0119	-0.0381	-0.0377	-0.0183
y2009	0.0462***	0.0314**	0.0440***	0.0475**	0.0385**	0.0494***	0.0424	0.0172	0.0252
_cons	0.464***	0.980***	1.217***	0.462***	1.024***	1.311***	0.472***	0.960***	0.985**
N	23668	23667	23656	19414	19413	19403	4254	4254	4253

Source: Own calculations based on SILC 2006-2009 (Panel observations only).
Notes : [1]For variable definitions, see Appendix Table A.6. [2]Dependent variable: Log real hourly earnings
[3] Independent variable base category: Informal Salaried, Male, Age15to24, Primary education, Not student, Single household, Not household head, No other formal household member, Manufacturing sector, Professional occupation, Small firm, Year 2006.
Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table 5.4: Pooled Quantile Mincer Earnings Regressions (Across Formal/Informal Employment)

	ALL						
	5th quantile	10th quantile	25th quantile	50th quantile	75th quantile	90th quantile	95th quantile
Informal	-0.593***	-0.452***	-0.277***	-0.167***	-0.0892***	0.000798	0.129**
Hourspw	-0.0156***	-0.0162***	-0.0165***	-0.0166***	-0.0168***	-0.0165***	-0.0159***
Exper	0.0321***	0.0275***	0.0254***	0.0242***	0.0251***	0.0175***	0.00803*
Expersq	-0.000739***	-0.000636***	-0.000571***	-0.000519***	-0.000523***	-0.000299***	-0.00000231
Female	-0.0450	-0.0673*	-0.0660***	-0.0686***	-0.0429***	-0.0404*	-0.0117
age25to44	0.0314	-0.00346	0.0172	0.0541***	0.0653***	-0.0306	-0.111**
age45to64	0.0360	-0.0101	0.0134	0.0444*	0.0657**	-0.00638	-0.138***
Illiterate	-0.300	-0.160	-0.103**	-0.106*	-0.0915	-0.00133	-0.0815
None	0.0257	-0.0327	-0.0436	-0.0418	-0.0804**	-0.172***	-0.159**
Secondary	0.0227	0.0438*	0.0446***	0.0693***	0.0743***	0.0927***	0.0806**
High	0.167***	0.156***	0.161***	0.187***	0.179***	0.199***	0.200***
Vocational	0.121**	0.133***	0.167***	0.195***	0.197***	0.196***	0.214***
University	0.376***	0.389***	0.399***	0.431***	0.426***	0.440***	0.465***
student	0.155	-0.239	-0.751	0.107	-0.286	-0.971	-1.559
Married	0.0410	0.0555*	0.0595***	0.0425***	0.0217	0.0317	0.0327
hhead	0.139***	0.108***	0.0885***	0.0682***	0.0984***	0.107***	0.121***
child	0.0328	0.0382*	0.0249*	0.0302**	0.0187	0.0228	0.0451
hhsize	-0.00137	-0.00917**	-0.00929***	-0.0115***	-0.00912**	-0.0124***	-0.0179**
otherf	-0.208***	-0.144***	-0.0466*	0.0326*	0.0700**	0.119**	0.206***
Mining	-0.0550	-0.0381	-0.0211	0.0313	0.108	0.161***	0.0835
Energy	0.191*	0.213**	0.288***	0.336***	0.318***	0.218***	0.146**
Construction	0.177***	0.156***	0.135***	0.164***	0.194***	0.154***	0.115***
Trade	0.0797**	0.0337	-0.00379	0.00986	0.0481***	0.0651**	0.0668
Hotels	0.0388	0.0275	0.00102	0.0324	0.0205	0.0388	0.0672
Transportation	0.0978**	0.0842***	0.0678***	0.106***	0.188***	0.170***	0.134***
Finances	-0.0821*	-0.0796**	-0.115***	-0.0457**	0.0880**	0.139**	0.145***
PublicAdministra	0.156***	0.126***	0.133***	0.114***	0.0464***	-0.0533*	-0.101***
Education	0.156***	0.106***	0.0616***	-0.00115	-0.155***	-0.346***	-0.460***
Health	0.0817*	0.0735***	0.112***	0.133***	0.0859***	0.0589	0.0712
OtherServices	0.0534	0.00989	0.00317	-0.00157	0.00394	-0.0476	-0.0968*
Legislators	-0.344***	-0.302***	-0.142***	0.0454*	0.117***	0.0959***	0.118**
Technicians	-0.219***	-0.202***	-0.185***	-0.143***	-0.167***	-0.244***	-0.233***
Clerks	-0.278***	-0.317***	-0.309***	-0.286***	-0.335***	-0.403***	-0.355***
ServiceWorkers	-0.315***	-0.336***	-0.324***	-0.292***	-0.337***	-0.400***	-0.409***
SkilledAgricultur	-0.387	-0.404**	-0.288***	-0.272***	-0.331***	-0.562***	-0.531***
Craftsmen	-0.397***	-0.382***	-0.333***	-0.282***	-0.321***	-0.383***	-0.405***
PlantOperators	-0.303***	-0.331***	-0.312***	-0.271***	-0.330***	-0.401***	-0.387***
ElementaryOpera	-0.416***	-0.435***	-0.423***	-0.388***	-0.422***	-0.455***	-0.403***
medium	0.170***	0.127***	0.0988***	0.0901***	0.0954***	0.0601**	0.0465
large	0.316***	0.266***	0.212***	0.200***	0.224***	0.229***	0.218***
_cons	0.642	0.946***	1.235***	1.362***	1.667***	2.382***	2.815***
N	23656						

Source: Own calculations based on SILC 2006-2009 (Panel observations only).
Notes : [1]For variable definitions, see Appendix Table A.6. [2]Dependent variable: Log real hourly earnings
[3] Independent variable base category: Formal, Male, Age15to24, Primary education, Not student, Single household, Not household head, No other formal household member, Manufacturing sector, Professional occupation, Small firm, Year 2006.
Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table 5.5: Pooled Quantile Mincer Earnings Regressions (Male only) (Across Formal/Informal Employment)

	MALE						
	5th quantile	**10th quantile**	**25th quantile**	**50th quantile**	**75th quantile**	**90th quantile**	**95th quantile**
informal	-0.476***	-0.404***	-0.232***	-0.161***	-0.137***	-0.0359	0.0359
Hourspw	-0.0151***	-0.0161***	-0.0168***	-0.0164***	-0.0159***	-0.0157***	-0.0146***
Exper	0.0301***	0.0271***	0.0257***	0.0254***	0.0282***	0.0229***	0.0164**
Expersq	-0.000697***	-0.000644***	-0.000588***	-0.000533***	-0.000587***	-0.000400***	-0.000179
Female							
age25to44	0.0597	0.0197	0.0203	0.0362*	0.0214	-0.102**	-0.177**
age45to64	0.0459	0.0107	0.0187	0.0239	0.0254	-0.0921*	-0.195**
Illiterate	-0.215	-0.131	-0.0829*	-0.103**	-0.105*	-0.0209	-0.143
None	0.0338	-0.00732	-0.0554*	-0.0660**	-0.0902**	-0.162**	-0.158**
Secondary	0.00323	0.0414**	0.0499***	0.0802***	0.0820***	0.0836***	0.0943**
High	0.162***	0.157***	0.165***	0.194***	0.183***	0.177***	0.194***
Vocational	0.0947**	0.116***	0.171***	0.201***	0.206***	0.201***	0.237***
University	0.372***	0.388***	0.409***	0.434***	0.410***	0.414***	0.503***
student	-0.0654	-0.280	-0.819	0.134	-0.223	-0.935	-1.466
Married	0.111	0.109***	0.0603***	0.0564***	0.0264	0.0591*	0.0206
hhead	0.113***	0.0682***	0.0957***	0.0678***	0.101***	0.0978***	0.0940**
child	0.0526	0.0402*	0.0147	0.0309**	0.000649	-0.000191	0.0321
hhsize	-0.00487	-0.00881**	-0.00591**	-0.00976***	-0.00503	-0.00983**	-0.0111
otherf	-0.123*	-0.127***	-0.0115	0.0386**	0.0409	0.132**	0.162*
Mining	-0.0512	-0.0386	-0.0459	0.0147	0.112	0.157***	0.0703
Energy	0.189**	0.222***	0.285***	0.368***	0.291***	0.191*	0.174
Construction	0.0643	0.0970***	0.101***	0.139***	0.175***	0.162***	0.154***
Trade	0.00794	-0.00581	-0.0289*	-0.00671	0.0188	0.0726**	0.0924**
Hotels	0.0207	-0.0186	-0.0390	-0.00580	-0.0140	-0.000785	0.0402
Transportation	0.0385	0.0436*	0.0447**	0.0876***	0.152***	0.178***	0.191***
Finances	-0.144***	-0.136***	-0.150***	-0.0833***	0.0708	0.164***	0.186***
PublicAdministra	0.111**	0.0946***	0.113***	0.0969***	0.0277*	-0.0498*	-0.0746*
Education	0.0942*	0.0851***	0.0424	-0.0171	-0.164***	-0.327***	-0.421***
Health	0.0253	0.0267	0.136***	0.157***	0.115***	0.0651*	0.149
OtherServices	-0.0485	-0.0703**	-0.0638***	-0.0521**	-0.0510**	-0.0816*	-0.0889*
Legislators	-0.409***	-0.350***	-0.159***	0.0350	0.0952***	0.0664	0.141*
Technicians	-0.293***	-0.226***	-0.190***	-0.133***	-0.150***	-0.221***	-0.199**
Clerks	-0.313***	-0.322***	-0.294***	-0.273***	-0.331***	-0.439***	-0.380***
ServiceWorkers	-0.372***	-0.358***	-0.324***	-0.280***	-0.328***	-0.419***	-0.386***
SkilledAgricultur	-0.397	-0.431***	-0.323***	-0.249***	-0.326***	-0.498***	-0.518***
Craftsmen	-0.371***	-0.349***	-0.309***	-0.262***	-0.314***	-0.393***	-0.373***
PlantOperators	-0.353***	-0.348***	-0.312***	-0.275***	-0.333***	-0.425***	-0.374***
ElementaryOpera	-0.488***	-0.459***	-0.438***	-0.393***	-0.426***	-0.470***	-0.397***
medium	0.157***	0.103***	0.0756***	0.0663***	0.0589***	0.0499**	0.0379
large	0.284***	0.239***	0.194***	0.194***	0.217***	0.232***	0.226***
_cons	0.809***	1.043***	1.307***	1.368***	1.721***	2.385***	2.759***
N	19403						

Source: Own calculations based on SILC 2006-2009 (Panel observations only).
Notes : [1]For variable definitions, see Appendix Table A.6. [2]Dependent variable: Log real hourly earnings
[3] Independent variable base category: Formal, Male, Age15to24, Primary education, Not student, Single household, Not household head, No other formal household member, Manufacturing sector, Professional occupation, Small firm, Year 2006.
Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table 5.6: Pooled Quantile Mincer Earnings Regressions (Female only) (Across Formal/Informal Employment)

	FEMALE						
	5th quantile	**10th quantile**	**25th quantile**	**50th quantile**	**75th quantile**	**90th quantile**	**95th quantile**
informal	-0.450***	-0.435***	-0.300***	-0.167***	-0.0462	0.151	0.351**
Hourspw	-0.0178***	-0.0172***	-0.0179***	-0.0182***	-0.0208***	-0.0241***	-0.0208***
Exper	0.0415***	0.0268***	0.0223***	0.0199***	0.0127**	0.0053	-0.0199
Expersq	-0.000991**	-0.000549**	-0.000491***	-0.000481**	-0.000205	-2.77E-05	0.000577
Female							
age25to44	0.0571	0.0662*	0.0833*	0.0886**	0.0926***	0.127***	0.193*
age45to64	-0.0339	0.0175	0.0317	0.0766	0.0667	0.0963	0.18
Illiterate	0.023	-0.165	-0.155	-0.0508	-0.0306	0.000268	0.0821
None	-0.14	-0.019	0.073	0.0497	0.0322	-0.129	-0.319*
Secondary	0.113	0.0587	0.0424	0.0945***	0.0378	0.0828	-0.0675
High	0.234***	0.176***	0.186***	0.196***	0.232***	0.343***	0.319***
Vocational	0.221***	0.165***	0.197***	0.168***	0.181***	0.273***	0.171**
University	0.411***	0.346***	0.365***	0.366***	0.453***	0.554***	0.499***
student							
Married	-0.0178	0.0238	0.0422	0.00148	-0.0119	-0.0298	-0.0574
hhead	0.0831	0.0796*	0.0628*	0.0406	0.0508	0.141***	0.168*
child	-0.015	0.0356	0.026	0.0212	0.0296	0.111**	0.241***
hhsize	-0.0169	-0.0262*	-0.0161*	-0.0226***	-0.0238***	-0.0214	-0.0559***
otherf	-0.0116	-0.097	-0.0588	0.0509	0.055	0.0634	0.181
Mining	0.524	0.395	0.177	-0.0386	0.0484	-0.336	-0.698***
Energy	-3.227	-3.371	0.149	-0.0431	-0.182	-0.531**	-0.889***
Construction	0.299*	0.0632	0.0625	0.0637	0.0535	0.253	-0.241
Trade	0.00586	0.0573	0.0821*	0.0281	0.0442	0.0174	-0.116
Hotels	-0.0113	-0.0378	0.0838	0.172**	0.161*	0.168	0.307
Transportation	0.304**	0.250***	0.188*	0.268**	0.261**	-0.0471	-0.291**
Finances	0.0121	-0.00359	0.00149	0.0503	0.0685	-0.0428	-0.127
PublicAdministra	0.234**	0.178**	0.172***	0.151**	0.0848*	-0.161	-0.411***
Education	0.131	0.117	0.0603	-0.0315	-0.173**	-0.476***	-0.688***
Health	0.0847	0.0953	0.122**	0.101*	0.098	-0.00174	-0.220*
OtherServices	0.156*	0.141*	0.165***	0.166***	0.108	-0.0854	-0.314**
Legislators	-0.119	-0.0596	-0.0351	0.0935	0.320***	0.361***	0.242*
Technicians	-0.068	-0.164**	-0.203***	-0.228***	-0.191***	-0.304***	-0.257**
Clerks	-0.211***	-0.314***	-0.382***	-0.414***	-0.350***	-0.295***	-0.226**
ServiceWorkers	-0.14	-0.248***	-0.346***	-0.399***	-0.365***	-0.333***	-0.338***
SkilledAgricultur	0.683	0.251*	-0.0794	-0.324*	-0.765*	-1.182*	-1.496
Craftsmen	-1.628***	-1.715***	-1.244***	-0.684***	-0.557***	-0.555***	-0.708***
PlantOperators	-0.119	-0.233***	-0.296***	-0.359***	-0.359***	-0.347*	-0.372*
ElementaryOpera	-0.173*	-0.306***	-0.372***	-0.454***	-0.413***	-0.428***	-0.336*
medium	0.219***	0.247***	0.248***	0.237***	0.187***	0.121*	0.165*
large	0.396***	0.368***	0.302***	0.282***	0.235***	0.256***	0.301***
_cons	-0.995	-0.707	1.203	1.421***	1.771***	2.231***	2.755***
N	4253						

Source: Own calculations based on SILC 2006-2009 (Panel observations only).
Notes : [1]For variable definitions, see Appendix Table A.6. [2]Dependent variable: Log real hourly earnings
[3] Independent variable base category: Formal, Male, Age15to24, Primary education, Not student, Single household, Not household head, No other formal household member, Manufacturing sector, Professional occupation, Small firm, Year 2006.
Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table 5.7: Pooled Quantile Mincer Earnings Regressions (Across Formal/Informal and Salaried/Self-employment)

	ALL						
	5th quantile	10th quantile	25th quantile	50th quantile	75th quantile	90th quantile	95th quantile
Formal Salaried	0.559***	0.429***	0.268***	0.159***	0.0754**	-0.0291	-0.154**
Formal Self-employed	0.490***	0.417***	0.238***	0.217***	0.240***	0.168***	0.161*
Informal Self-employed	-0.318***	-0.217***	-0.0991***	-0.0203	0.0396	0.0743*	0.0826
Hourspw	-0.0158***	-0.0162***	-0.0164***	-0.0166***	-0.0170***	-0.0167***	-0.0164***
Exper	0.0303***	0.0271***	0.0252***	0.0242***	0.0246***	0.0177***	0.00946*
Expersq	-0.000697***	-0.000616***	-0.000556***	-0.000517***	-0.000514***	-0.000303***	-0.0000605
Female	-0.0450	-0.0687***	-0.0653***	-0.0682***	-0.0438**	-0.0423	-0.0277
age25to44	0.0624	0.00428	0.0222	0.0551***	0.0613**	-0.0360	-0.0952*
age45to64	0.0657	-0.00668	0.0159	0.0445*	0.0510	-0.0307	-0.115
Illiterate	-0.279*	-0.107	-0.104**	-0.121***	-0.0974*	-0.0136	-0.0775
None	0.0456	-0.0387	-0.0462	-0.0333	-0.0811***	-0.155***	-0.167**
Secondary	0.0158	0.0386*	0.0443***	0.0714***	0.0775***	0.0887***	0.0904**
High	0.169***	0.156***	0.158***	0.188***	0.184***	0.205***	0.184***
Vocational	0.139***	0.133***	0.165***	0.195***	0.200***	0.205***	0.214***
University	0.390***	0.392***	0.392***	0.432***	0.434***	0.451***	0.489***
student	0.0961	-0.235	-0.774	0.109	-0.316	-1.036	-1.634
Married	0.0358	0.0594**	0.0627***	0.0432***	0.0195	0.0200	0.0167
hhead	0.154***	0.108***	0.0876***	0.0692***	0.103***	0.108***	0.103***
child	0.0204	0.0320*	0.0201*	0.0277**	0.0110	0.0249	0.0437
hhsize	-0.000952	-0.00809*	-0.00897***	-0.0113***	-0.00872**	-0.0128***	-0.0161***
otherf	-0.207***	-0.166***	-0.0553*	0.0278	0.0633*	0.122**	0.211***
Mining	-0.0307	-0.0444	-0.0214	0.0259	0.117	0.183**	0.0924
Energy	0.193*	0.199**	0.297***	0.334***	0.315***	0.249***	0.166**
Construction	0.153***	0.146***	0.131***	0.160***	0.200***	0.167***	0.123***
Trade	0.0877***	0.0496*	0.00483	0.00657	0.0324*	0.0459*	0.0278
Hotels	0.0573	0.0464	-0.00557	0.0287	0.0210	0.0365	0.0525
Transportation	0.123***	0.0823***	0.0778***	0.104***	0.159***	0.152***	0.118**
Finances	-0.0850**	-0.0773***	-0.112***	-0.0460*	0.0841**	0.146***	0.122**
PublicAdministration	0.132***	0.124***	0.130***	0.113***	0.0470***	-0.0407	-0.105**
Education	0.148***	0.109***	0.0607***	-0.00216	-0.152***	-0.331***	-0.469***
Health	0.0717	0.0781*	0.114***	0.133***	0.0898***	0.0492	0.0710
OtherServices	0.0540	0.0225	-0.00219	0.000221	0.0130	-0.0315	-0.0894
Legislators	-0.312***	-0.288***	-0.117***	0.0309	0.0841**	0.0835**	0.110**
Technicians	-0.208***	-0.198***	-0.193***	-0.142***	-0.157***	-0.232***	-0.241***
Clerks	-0.276***	-0.315***	-0.314***	-0.285***	-0.321***	-0.379***	-0.325***
ServiceWorkers	-0.315***	-0.351***	-0.339***	-0.293***	-0.324***	-0.370***	-0.375***
SkilledAgricultural	-0.359	-0.385***	-0.294***	-0.264***	-0.326***	-0.485***	-0.507***
Craftsmen	-0.382***	-0.377***	-0.339***	-0.282***	-0.319***	-0.363***	-0.400***
PlantOperators	-0.287***	-0.321***	-0.321***	-0.270***	-0.328***	-0.389***	-0.384***
ElementaryOperations	-0.390***	-0.428***	-0.431***	-0.387***	-0.416***	-0.428***	-0.382***
medium	0.142***	0.112***	0.0940***	0.0935***	0.114***	0.110***	0.0965***
large	0.300***	0.259***	0.212***	0.204***	0.249***	0.285***	0.278***
_cons	0.122	0.511***	1.001***	1.193***	1.587***	2.365***	2.987***
N	23656						

Source: Own calculations based on SILC 2006-2009 (Panel observations only).
Notes : [1]For variable definitions, see Appendix Table A.6. [2]Dependent variable: Log real hourly earnings
[3] Independent variable base category: Informal Salaried, Male, Age15to24, Primary education, Not student, Single household, Not household head, No other formal household member, Manufacturing sector, Professional occupation, Small firm, Year 2006.
Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table 5.8: Pooled Quantile Mincer Earnings Regressions (Male only) (Across Formal/Informal and Salaried/Self-employment)

	MALE						
	5th quantile	**10th quantile**	**25th quantile**	**50th quantile**	**75th quantile**	**90th quantile**	**95th quantile**
Formal Salaried	0.446***	0.387***	0.232***	0.155***	0.118***	0.0156	-0.0877
Formal Self-employed	0.390***	0.392***	0.221***	0.217***	0.268***	0.212***	0.224***
Informal Self-employed	-0.134**	-0.0609	-0.00963	0.0154	0.0842**	0.136**	0.131*
Hourspw	-0.0152***	-0.0160***	-0.0168***	-0.0165***	-0.0160***	-0.0161***	-0.0152***
Exper	0.0293***	0.0271***	0.0259***	0.0253***	0.0279***	0.0221***	0.0173***
Expersq	-0.000669***	-0.000634***	-0.000594***	-0.000532***	-0.000580***	-0.000401***	-0.000225
age25to44	0.0568	0.023	0.0198	0.0344*	0.0243	-0.102**	-0.174***
age45to64	0.0335	0.0106	0.0215	0.022	0.0196	-0.0969*	-0.190**
Illiterate	-0.210**	-0.086	-0.0809*	-0.104***	-0.143**	-0.0406	-0.157
None	0.0349	-0.014	-0.0534*	-0.0640*	-0.0870**	-0.146**	-0.156*
Secondary	-0.000341	0.0392*	0.0505***	0.0801***	0.0828***	0.0862**	0.0874**
High	0.171***	0.156***	0.164***	0.197***	0.193***	0.195***	0.185***
Vocational	0.102**	0.116***	0.171***	0.204***	0.210***	0.223***	0.225***
University	0.381***	0.389***	0.406***	0.439***	0.425***	0.436***	0.503***
student	-0.0482	-0.291	-0.822	0.13	-0.279	-0.998	-1.497
Married	0.134**	0.106***	0.0630***	0.0524***	0.0128	0.0485	0.0143
hhead	0.0898**	0.0684***	0.0944***	0.0693***	0.110***	0.0941**	0.0833**
child	0.0633*	0.0375*	0.0158	0.0316**	-0.0029	0.0000247	0.0274
hhsize	-0.00791	-0.00820*	-0.00600**	-0.00962***	-0.00528	-0.0120**	-0.0132*
otherf	-0.117*	-0.124**	-0.00914	0.0376*	0.0419	0.127**	0.193***
Mining	-0.0715	-0.0354	-0.0467	0.0147	0.0963	0.176***	0.0921
Energy	0.188*	0.224**	0.283***	0.371***	0.292***	0.214***	0.211***
Construction	0.0458	0.0906***	0.101***	0.138***	0.183***	0.165***	0.161***
Trade	0.0205	-0.0089	-0.0259*	-0.0103	0.0115	0.0391	0.0426
Hotels	0.0207	-0.01	-0.043	-0.00272	-0.0138	0.0121	0.0504
Transportation	0.0727*	0.0454*	0.0459***	0.0771***	0.128***	0.161***	0.141***
Finances	-0.136**	-0.139***	-0.148***	-0.0889***	0.0662	0.159***	0.159***
PublicAdministration	0.0844*	0.0918***	0.112***	0.0975***	0.0366	-0.0454	-0.0675*
Education	0.0983*	0.0811***	0.0415*	-0.0155	-0.152***	-0.328***	-0.407***
Health	0.0235	0.0219	0.136***	0.153***	0.114**	0.0656	0.12
OtherServices	-0.077	-0.0699*	-0.0631**	-0.0514*	-0.0364	-0.0774*	-0.0863
Legislators	-0.382***	-0.352***	-0.156***	0.0238	0.0653*	0.0465	0.134*
Technicians	-0.298***	-0.228***	-0.188***	-0.129***	-0.127***	-0.217***	-0.174**
Clerks	-0.328***	-0.326***	-0.295***	-0.268***	-0.309***	-0.413***	-0.348***
ServiceWorkers	-0.376***	-0.364***	-0.326***	-0.277***	-0.301***	-0.384***	-0.369***
SkilledAgricultural	-0.368	-0.439*	-0.328***	-0.243***	-0.306***	-0.472***	-0.513***
Craftsmen	-0.360***	-0.355***	-0.313***	-0.259***	-0.293***	-0.365***	-0.354***
PlantOperators	-0.355***	-0.356***	-0.316***	-0.271***	-0.307***	-0.411***	-0.373***
ElementaryOperations	-0.470***	-0.460***	-0.441***	-0.387***	-0.407***	-0.440***	-0.373***
medium	0.142***	0.101***	0.0753***	0.0768***	0.0957***	0.103***	0.0959***
large	0.277***	0.240***	0.193***	0.204***	0.249***	0.291***	0.287***
_cons	0.340*	0.645***	1.075***	1.192***	1.564***	2.360***	2.743***
N	19403						

Source: Own calculations based on SILC 2006-2009 (Panel observations only).
Notes : [1]For variable definitions, see Appendix Table A.6. [2]Dependent variable: Log real hourly earnings
[3] Independent variable base category: Informal Salaried, Male, Age15to24, Primary education, Not student, Single household, Not household head, No other formal household member, Manufacturing sector, Professional occupation, Small firm, Year 2006.
Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table 5.9: Pooled Quantile Mincer Earnings Regressions (Female only) (Across Formal/Informal and Salaried/Self-employment)

	FEMALE						
	5th quantile	**10th quantile**	**25th quantile**	**50th quantile**	**75th quantile**	**90th quantile**	**95th quantile**
Formal Salaried	0.481***	0.401***	0.308***	0.150***	-0.00263	-0.200	-0.421***
Formal Self-employed	0.0466	0.255	0.121	0.286**	0.195*	-0.0441	-0.372*
Informal Self-employed	-0.670**	-0.455*	-0.618***	-0.400***	-0.267***	-0.275**	-0.288
Hourspw	-0.0188***	-0.0178***	-0.0188***	-0.0184***	-0.0216***	-0.0243***	-0.0224***
Exper	0.0412***	0.0262***	0.0236***	0.0181***	0.0152***	0.00506	-0.0147
Expersq	-0.000916*	-0.000441	-0.000547***	-0.000355***	-0.000306	-0.0000443	0.000447
age25to44	0.0447	0.0689	0.0716**	0.0908**	0.0919**	0.111*	0.157
age45to64	-0.0456	-0.00792	0.0672	0.0478	0.0856	0.0994	0.191
Illiterate	0.0108	-0.129	-0.107	-0.0308	-0.0222	0.120	0.179
None	-0.109	-0.0676	0.103	0.0528	0.0481	-0.206	-0.404
Secondary	0.0844	0.0945*	0.0435	0.0819*	0.0717	0.0688	-0.000825
High	0.246***	0.203***	0.170***	0.189***	0.256***	0.365***	0.275**
Vocational	0.229***	0.189***	0.188***	0.167***	0.205***	0.294***	0.137
University	0.415***	0.377***	0.348***	0.363***	0.484***	0.573***	0.469***
Married	-0.00984	0.0248	0.0558*	0.0134	-0.0269	-0.0219	-0.0461
hhead	0.0969	0.0978***	0.0749**	0.0503	0.0643	0.138***	0.133
child	0.0178	0.0169	0.0275	0.0167	0.0352	0.0985**	0.199***
hhsize	-0.0193	-0.0247*	-0.0129	-0.0197**	-0.0247**	-0.0188	-0.0536***
otherf	-0.0929	-0.101	-0.103	0.00147	0.0691	-0.00968	0.163
Mining	0.532	0.408	0.156	-0.0000299	0.0189	-0.338	-0.732*
Energy	-3.246	-3.364	0.0486	-0.0933	-0.200	-0.508**	-0.917***
Construction	0.299*	0.144	0.0465	0.0406	0.0386	0.277	-0.149
Trade	0.0683	0.0688	0.113***	0.0449	0.0341	0.0442	-0.0722
Hotels	0.00923	-0.0537	0.0757	0.163**	0.131*	0.179	0.406
Transportation	0.310**	0.217***	0.196**	0.273***	0.243***	-0.0217	-0.213*
Finances	0.00536	-0.0129	0.0173	0.0533	0.0579	-0.0182	-0.138
PublicAdministration	0.200	0.144*	0.163***	0.154**	0.0691	-0.152	-0.347**
Education	0.0968	0.0782	0.0305	-0.0286	-0.203***	-0.451***	-0.691***
Health	0.108	0.0813	0.107**	0.103*	0.0857	0.000245	-0.190
OtherServices	0.148	0.120	0.139**	0.157**	0.115*	-0.0885	-0.354***
Legislators	-0.0516	-0.0691	0.0338	0.138*	0.287***	0.374***	0.223
Technicians	-0.138	-0.169**	-0.208***	-0.221***	-0.193***	-0.281***	-0.277***
Clerks	-0.255***	-0.334***	-0.408***	-0.404***	-0.346***	-0.288***	-0.262**
ServiceWorkers	-0.183*	-0.272***	-0.403***	-0.402***	-0.352***	-0.334***	-0.361**
SkilledAgricultural	1.145*	0.557	0.446*	-0.0682	-0.469	-0.962	-1.366*
Craftsmen	-1.356***	-1.517***	-1.093***	-0.640***	-0.562***	-0.539***	-0.713***
PlantOperators	-0.171	-0.254***	-0.345***	-0.360***	-0.354***	-0.331*	-0.363*
ElementaryOperations	-0.232*	-0.309***	-0.427***	-0.468***	-0.399***	-0.402***	-0.409**
medium	0.184**	0.230***	0.213***	0.224***	0.192***	0.142**	0.171*
large	0.354***	0.356***	0.268***	0.270***	0.243***	0.282***	0.285***
fulltime	1.605*	1.590*	0.174	0.0974	0.154	0.247	-0.0386
N	4253						

Source: Own calculations based on SILC 2006-2009 (Panel observations only).
Notes : [1]For variable definitions, see Appendix Table A.6. [2]Dependent variable: Log real hourly earnings
[3] Independent variable base category: Informal Salaried, Male, Age15to24, Primary education, Not student, Single household, Not household head, No other formal household member, Manufacturing sector, Professional occupation, Small firm, Year 2006.
Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table 5.10: Fixed Effects Regressions (Across Formal/Informal Employment)

	ALL (1) Fixed Effects	MALE (2) Fixed Effects	FEMALE (3) Fixed Effects
Informal	-0.0697	-0.106*	0.0741
Hourspw	-0.0179***	-0.0177***	-0.0193***
Exper	0.00700	0.00903*	-0.000942
Expersq	-0.000141	-0.000187	0.000117
Female	0		
age25to44	0.0776**	0.0951**	0.0188
age45to64	0.0944*	0.109**	0.0760
Illiterate	0.0262	0.0430	-0.259**
None	-0.117	-0.123	0.185
Secondary	-0.0168	-0.0670	0.321
High	0.0977	0.0388	0.377*
Vocational	0.284*	0.208	0.650**
University	0.237	0.241	0.433*
student	0.251	0.289	0
Married	0.0361	0.0460	0.00557
hhead	0.0104	-0.00743	0.0609
child	0.00971	-0.0130	0.103
hhsize	-0.00296	0.00146	-0.0364*
otherf	-0.0211	-0.0424	0.0146
Mining	0.172	0.157	0
Energy	0.0411	0.123	-0.710
Construction	0.0647	0.0493	0.204
Trade	0.0272	0.00604	0.176
Hotels	0.0809	0.0569	0.263
Transportation	-0.0319	-0.0457	0.146
Finances	-0.00813	-0.0663	0.251
PublicAdministration	-0.00110	0.0182	0.0182
Education	-0.0616	0.0897	-0.140
Health	0.160	0.215	0.212
OtherServices	0.0865	0.0563	0.196
Legislators	0.0847	0.0396	0.116
Technicians	-0.151	-0.214*	-0.00883
Clerks	-0.0900	-0.111	-0.0308
ServiceWorkers	-0.0418	-0.111	0.204
SkilledAgricultural	0.0518	-0.00960	0
Craftsmen	0.000433	-0.0593	0.215
PlantOperators	-0.0449	-0.115	0.252
ElementaryOperations	-0.00381	-0.0565	0.185
medium	-0.0149	-0.0257	0.0291
large	0.142***	0.145**	0.128
_cons	1.598***	1.696***	1.221**
N	23656	19403	4253

Source: Own calculations based on SILC 2006-2009 (Panel observations only).
Notes : [1]For variable definitions, see Appendix Table A.6. [2]Dependent variable: Log real hourly earnings
[3] Independent variable base category: Formal, Male, Age15to24, Primary education, Not student, Single household, Not household head, No other formal household member, Manufacturing sector, Professional occupation, Small firm, Year 2006.
Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table 5.11: Fixed Effects Regressions (Across Formal/Informal and Salaried/Self-employment)

	ALL	MALE	FEMALE
	(1)	(2)	(3)
	Fixed Effects	Fixed Effects	Fixed Effects
Formal salaried	0.0518	0.0952*	-0.0951
Formal self-employed	0.156*	0.211**	-0.183
Informal self-employed	0.00756	0.0608	-0.402*
Hourspw	-0.0180***	-0.0178***	-0.0198***
Exper	0.00711	0.00897*	-0.0000678
Expersq	-0.000143	-0.000185	0.000118
Female	0		
age25to44	0.0780**	0.0946**	0.0179
age45to64	0.0933*	0.107*	0.0567
Illiterate	0.0249	0.0374	-0.239**
None	-0.118	-0.121	0.182
Secondary	-0.0176	-0.0670	0.309
High	0.0974	0.0386	0.374*
Vocational	0.282*	0.203	0.659**
University	0.236	0.237	0.447*
student	0.248	0.287	0
Married	0.0361	0.0459	0.00780
hhead	0.0113	-0.00653	0.0667
child	0.00979	-0.0123	0.105
hhsize	-0.00273	0.00175	-0.0411*
otherf	-0.0230	-0.0432	0.00521
Mining	0.172	0.154	0
Energy	0.0457	0.128	-0.721
Construction	0.0653	0.0523	0.188
Trade	0.0230	-0.00321	0.156
Hotels	0.0762	0.0538	0.216
Transportation	-0.0354	-0.0511	0.135
Finances	-0.00949	-0.0699	0.226
PublicAdministration	0.00150	0.0216	-0.00230
Education	-0.0582	0.0961	-0.169
Health	0.160	0.214	0.194
OtherServices	0.0860	0.0530	0.184
Legislators	0.0771	0.0239	0.115
Technicians	-0.147	-0.209*	-0.00656
Clerks	-0.0859	-0.105	-0.0336
ServiceWorkers	-0.0356	-0.0997	0.200
SkilledAgricultural	0.0524	-0.00405	0
Craftsmen	0.000725	-0.0570	0.212
PlantOperators	-0.0417	-0.109	0.251
ElementaryOperations	-0.00130	-0.0520	0.194
medium	-0.00564	-0.0121	0.0188
large	0.153***	0.159***	0.116
_cons	1.530***	1.578***	1.423***
N	23656	19403	4253

Source: Own calculations based on SILC 2006-2009 (Panel observations only).
Notes : [1]For variable definitions, see Appendix Table A.6. [2]Dependent variable: Log real hourly earnings
[3] Independent variable base category: Informal Salaried, Male, Age15to24, Primary education, Not student, Single household, Not household head, No other formal household member, Manufacturing sector, Professional occupation, Small firm, Year 2006.
Legend: * for p<.05, ** for p<.01, and *** for p<.001

Table A.6: List of Definitions

Variable Name	*Definition*
Formality Status	
Formal	1 if registered to the Social Security Institution; 0 otherwise
Informal	1 if not registered to the Social Security Institution; 0 otherwise
Formal-salaried	1 if employee working for a wage/salary and registered to the SSI; 0 otherwise
Informal-salaried	1 if employee working for a wage/salary and not registered to the SSI; 0 otherwise
Formal self-employed	1 if own-account worker and registered to the SSI; 0 otherwise
Informal self-employed	1 if own-account worker and not registered to the SSI; 0 otherwise
logwagem	Real hourly logged wages calculated using a wage-worker's income, hours worked in the main job, the Turkish CPI
	Real hourly logged wages calculated using a self-employed's earnings, hours worked in the main job, the Turkish CPI
Hourspw	Weekly hours worked in the main job
Individual Characteristics	
Male	1 if male; 0 otherwise
Female	1 if female; 0 otherwise
Age15to24	1 if in age range; 0 otherwise
Age25to44	1 if in age range; 0 otherwise
Age45to64	1 if in age range; 0 otherwise
exper	total number of years the individual has worked for since he/she first started working
Illiterate	1 if illiterate; 0 otherwise
None	1 if did not attend school; 0 otherwise
Primary	1 if completed primary school; 0 otherwise
Secondary	1 if completed secondary school; 0 otherwise
High	1 if completed high school; 0 otherwise
Vocational	1 if completed vocational school; 0 otherwise
University	1 if completed university; 0 otherwise
student	1 if currently enrolled as a student; 0 otherwise
Household Characteristics	
Single	1 if not married; 0 otherwise
Married	1 if married; 0 otherwise
nochild	1 if the household do not have any children; 0 otherwise
child	1 if the household has children; 0 otherwise
hhead	1 if head of the household; 0 otherwise
hhsize	total number of members in the household
otherf	1 if there is another formally employed household member; 0 otherwise
Employment/Job Characteristics	
Regular employee	1 if employeed as a regular employee; 0 otherwise
Casual employee	1 if employed as a casual employee; 0 otherwise
Employer	1 if employer; 0 otherwise
Own-account worker	1 if own-account worker; 0 otherwise
Unpaid Family worker	1 if unpaid family worker; 0 otherwise
Agriculture	1 if employed in agriculture; 0 otherwise
Mining	1 if employed in mining; 0 otherwise
Manufacturing	1 if employed in manufacturing; 0 otherwise
Energy	1 if employed in energy; 0 otherwise
Construction	1 if employed in construction; 0 otherwise
Trade	1 if employed in trade; 0 otherwise
Hotels	1 if employed in hotels; 0 otherwise
Transportation	1 if employed in transportation; 0 otherwise
Finances	1 if employed in finances; 0 otherwise
Public Administration	1 if employed in piblic administration; 0 otherwise
Education	1 if employed in education; 0 otherwise
Health	1 if employed in health; 0 otherwise
Other	1 if employed in other services; 0 otherwise
Legislators	1 if employed as a legislator; 0 otherwise
Professional	1 if employed as a professional; 0 otherwise
Technicals	1 if employed as a technician; 0 otherwise
Clerks	1 if employed as a clerk; 0 otherwise
Service workers	1 if employed as a service worker; 0 otherwise
Skilled agricultural workers	1 if employed as a skilled agricultural worker; 0 otherwise
Craftsmen	1 if employed as a craftsmen; 0 otherwise
Plant operators	1 if employed as a plant operator; 0 otherwise
Elementary operations	1 if employed as a elemenatry opr. worker; 0 otherwise
small	1 if firm size is between 1 to 10; 0 otherwise
medium	1 if firm size is between 11 to 49; 0 otherwise
large	1 if firm size is 50 or more; 0 otherwise
full-time	1 if emplyed as full-time; 0 otherwise
part-time	1 if employed as part-time; 0 otherwise

CHAPTER 6

CONCLUSION

6.1. Summary of the Main Findings and Conclusions

In this thesis, the nature, extent and dynamics of informal employment in the Turkish labor market are investigated using 2006-2009 Turkish Income and Living Conditions Survey (SILC). Given its severity and persistence in the labor market, the aim is to illuminate the informality phenomenon in terms of three main dimensions. First, we discuss the relevance and implications of different conceptualizations of informality in the Turkish labor market context following the evolution of the theoretical and empirical literature. Second, we examine the mobility of workers into and out of formal/informal sectors using advanced panel data sets and techniques. Lastly, we consider the remuneration aspects of formal/informal employment, and test if there exists an earnings premium/penalty associated with formal/informal employment. Following these lines of research, the ultimate objective is to improve the understanding of informality concept, thereby stimulate vigorous analyses of the labor markets and policy.

Against this background, the main contributions of this thesis are mainly threefold. First, this analysis is the first attempt to study different definitions and measures of informal employment in Turkey, using multiple characterizations. Moreover, the analysis is linked to the evolution of the theory of informal and formal labor markets and thereby provides a synthesis of empirical and theoretical literature in the Turkish context. Due to the novel nature of the Income and Living Conditions Survey (SILC) data set, the time span of this study also allows the exploration of the existence and extent of any effect of global economic crisis in the Turkish labor market along the formal/informal divide.

Second, in the early literature, most analyses hinged on static and aggregate approaches. With the introduction of advanced panel data sets and techniques, more profound and thorough dynamic research was empowered. Labor mobility analysis is one of the most rigorous and informative among these, since it enables dynamic worker flows to be explored across distinct labor market states. To the best of our knowledge and thanks to the panel nature of our data set, this is the first attempt to examine labor mobility in the context of formal/informal divide using Turkish data. More specifically, an extensive mobility analysis is conducted with the aim of examining the nature and extent of worker flows across employment and non-employment labor market states and identifying the effects of certain individual and employment characteristics on variant mobility patterns.

Third, this study offers the first analysis of earnings differentials between formal and informal employment in Turkey using panel data and techniques, thereby controlling for not only a rich set of observable characteristics but also individual time-invariant unobserved heterogeneity. In particular, the aim is to test whether there exist earnings penalties for informal workers, which imply the presence of segmentation in the labor market. Moreover, this analysis is the first such to explore earnings differences across the formal/informal as well as the wage/self-employment divide and along different points of the earnings distribution, thereby accounting for the potential structural heterogeneity within sectors.

As an initial step towards a rigorous and insightful analysis, one needs a thorough understanding of the structure and dynamics peculiar to the Turkish economy and labor market. Chapter 2 provides an extensive introductory overview of the main properties of the labor market in Turkey over the last 20 years.

Against this described background, in Chapter 3, we consider how informality can be defined and measured in the Turkish labor market given that there is no single universally accepted definition, but a multiple number of methods in the literature, tailored specifically to different time and space contexts. In this endeavor, we construct three alternative definitions following the evolution of theoretical and

empirical literature. The first one is an enterprise-based definition which describes informality with *employment in the informal sector*, where informal sector refers to small firms and self-employment. In similar vein, formality is ascribed to employment in large firms. In this methodology, informality is identified based on the characteristics of the enterprise rather than the worker. Then, this definition is extended in a way to refer to a more inclusive concept of *informal employment*, which is not confined solely to *employment in the informal sector*. This is done by re-classifying those workers who work in formal sector (based on the first definition) but do not have social security as informal, and those who work in informal sector but have social protection as formal. Lastly, third definition is identified exclusively on whether a worker has social security coverage.

One first notes that informality rates based on social security registration are lower by 10 percent compared to those based on enterprise characteristics. This discrepancy is most likely the result of majority of employment in the Turkish labor market, taking place in small firm or as self-employment. Indeed, Social Security Institute (2011) reports that there are only 28500 firms which has 50 or more workers in contrast to over one million firms which employs less than 50 workers in Turkey. Therefore, measuring informality via scale of employment may exacerbate its overall picture. Another notable finding is that social security is the most responsive measure to the effects of time and crisis on informality. In particular, informality rate based on social security definition follows a decreasing trend from 2006 to 2008, and records a slight increase in 2009, which is the year for the global economic crisis. Whereas, the other measures based on enterprise and job features display only little or no variation over time. Moreover, confirming the stylized fact of the Turkish labor market, we find that informality rates regardless of the definition used, is lower by 10-15 percent when non-agricultural employment is considered. This finding proves that agriculture is a highly informal sector, hence exacerbates the overall informality figures.

Next, we decompose informality under each definition by individual and job characteristics. The analysis reveals several noteworthy patterns in the labor

market. Along the gender divide, one notes that female informality is considerably higher under all the definitions, and the extent of overlap between different measures is remarkable. This result clearly confirms the stylized fact of Turkish employment structure that is women are mostly employed in small-scale firms or as unpaid family workers, and typically without having social protection. With regards to age, we detect a somewhat U-shaped relationship between informality and age for all three definitions. More specifically, the results imply three main points for further investigation. First, young workers are significantly more informal under the social security definition compared to the enterprise definition in contrast to all other age groups. This finding well conforms to the conventional wisdom which postulates that young workers are initially employed without social security registration and gradually become covered by social protection as they gain experience. Second, middle age workers exhibit the highest level of social protection coverage and lowest level of variation in informality over time. This finding is a mere reflection of the fact that social security coverage is highest for middle age workers, thereby confirms the mainstream literature. Also interesting is the result that workers of age group 55-64 suffer a severe level of informality regardless of the definition applied. They are significantly more likely to work in informal enterprises (i.e. firms with less than 10 workers, own-account or unpaid family work) when considering enterprise definition, and also more prone to working as uncovered when social security definition is applied. As for education, we observe that informality is strongly negatively associated with education level regardless of the measurement criteria used. This evidence is consistent with the basic premise which views informality as a low-skill phenomenon. Moreover, one notes that share of informality among high-skilled workers in non-agricultural employment displays a larger coincidence under all definitions. Moreover, there is only a minor variation in informality rate over time, when workers with high school or above education are considered. Breaking down informality by sector of economic activity and occupation also marks several evident patterns.

In order to further explain any conditional association, namely the marginal effects of potential factors on the likelihood of informality, we next estimate

probit regressions of the probability of being informal. The results, overall, point towards social security based definition being superior over enterprise-based definition in capturing the association between key individual and job characteristics and informality. More specifically, the well-established positive relationship between being female and informal is statistically insignificant when enterprise definition is used. Whereas, gender emerges as a powerful and robust predictor of the likelihood of being informal under the social protection measure. Regarding age, middle age workers are found to exhibit a significantly lower likelihood of being informal compared to the young workers for all definitions and all years in question. Whereas, the evidence for older workers is mixed. Namely, enterprise definition yields a significantly lower probability of informality for these workers but social security definition imply that they are no less likely than young to be informal. Another important disparity between the definitions is detected when education is considered. That is, education when used for explaining informality based on enterprise definition yields results, which contradict the renowned established theory, whereas it confirms all the expected patterns when informality is described by social protection. A similar picture emerges for the household characteristics variables, which are only statistically significant for informality based on social security coverage. More specifically, those workers who are married, household head or do not have children are significantly less likely to be informal. These findings, overall, point to the traditional family influences such as increased family responsibility and increased dependence on safe employment on individual employment decisions. Lastly, one notes that informal status defined on the basis of social security registration displays an almost completely different relationship with sector of economic activity, compared to that based on enterprise characteristics. Most notably, agriculture emerges as a strong predictor of being informal under social security measure. Enterprise definition, on the other hand, fails to identify such a prominent stylized fact on informality. Indeed starting with the mainstream literature, informality has been viewed as mostly a rural agricultural phenomenon, which is also a salient feature of Turkish labor markets.

In summary, the analyses in Chapter 3 provide a very comprehensive and detailed diagnosis of the Turkish labor market. Most importantly, the empirical analysis reveals that social security registration criterion is the most proper measure of informality in the Turkish labor market given its ability to capture key relationships between several individual and employment characteristics and the likelihood of informality. Moreover, it is the most responsive measure with regards to time and impacts of crisis on employment; easily measurable via individual labor force surveys; comparable with other country statistics; and that it carries important social and welfare implications for the society and the economy. Along these lines, we recommend researchers and policy-makers use the social security to define labor informality, for more accurate analyses of the Turkish labor markets.

With this profound understanding of informal employment in the Turkish labor market in terms of definition, measurement and dimensions at hand, in Chapter 4, we undertake a labor mobility analysis, which became only recently available with the introduction of panel data set from the Income and Living Conditions Survey (SILC), with a specific emphasis on formal/informal divide. In this framework, we first compute the transition probabilities separately for two, three and four year transitions pertaining to 2006 to 2007, 2006 to 2008 and 2006 to 2009 transitions; for total, male and female samples; and lastly for total and non-agricultural samples. We define six labor market states as formal-salaried, informal-salaried, formal self-employed, informal self-employed, unemployed and inactive. In this way, the aim is to contribute to the limited body of empirical stylized facts available on mobility and informality in the Turkish labor market. The probabilities for 2006-2007, 2006-2008 and 2006-2009 transitions are more or less similar. The most discernible pattern is that most individuals remain in their initial state, except for the unemployed, implying a pretty static labor market structure. Regarding the direction and degree of outflows, one notes that there is very limited mobility into the formal-salaried state. This evidence implies the existence of entry barriers to and/or preference for formal-salaried employment, thereby confirming the traditional dualistic theory of formal and informal labor

markets in the Turkish context. Informal-salaried workers, on the other hand, demonstrate a higher level of mobility than formal-salaried workers. The probability of transition from informal-salaried state to formal-salaried state is about 5 times of the probability of the reverse transition, hence conforms to the conventional theory asserting one-way flows from informality to formality. Regarding the mobility patterns of informal self-employed individuals, outflows are fairly limited. However, exclusion of agriculture changes the picture to a remarkable extent. In particular, the transition probabilities of flows into all other states double, except for that into the inactive state. This finding is of great importance since it reveals the fact that the nature of informal self-employment in Turkey differs from that in Brazil, Mexico and Argentina where it is often voluntary, and that it is more like a *lower-tier* self-employment. The unemployed appear as the most mobile among all labor market groups and display a heterogeneous transition pattern. A noteworthy finding is that probability of transition from unemployment to informal employment is almost twice of that to formal employment when 2006-2007 panel is considered. This result also depicts that formal employment opportunities are limited and have higher entry barriers. Inactives, who constitute the largest share of the labor force, exhibit almost negligible outflows demonstrating the rigid nature of the state. The result can be explained by discouraged worker effects and many women deliberately opting out of the labor market.

Next, we estimate multinomial logit regressions individually for each set of panel to identify the impact of individual characteristics underlying the worker transitions. Gender evinces to be the most significant determinant of labor flows. The findings clearly support the view that female are significantly disadvantaged in terms of labor market mobility. Particularly evident is that they are mostly found either in informal self-employed or inactive states, and display relatively lower probabilities of transition into other types of employment. This fact can be explained by several intrinsic factors including the traditional division of gender roles and family responsibility in the household, their reproductive role, negative discrimination against women in hires and lay-offs and their lower average level

of education. Another key factor explaining labor market transition patterns is education. In line with the conventional wisdom, having a high school and/or university degree appears to significantly reduce the probability of transition into informal employment. Indeed, the level of entry barriers and risk of being subject to involuntary layoffs are usually lower for better-educated workers. Therefore, they typically have a higher probability of moving into formal employment compared to the less-educated individuals. Regarding age, we find that the young often experience entry barriers to access formal employment, which is well in line with the traditional theory. The generous pension schemes resulting in an epidemic of early retirement, is also another significant determinant of mobility patterns in Turkey, which can readily be observed from the statistically significant effects of 45-64 age dummy. In particular, elderly display higher probabilities of transitions into inactivity, but lower probabilities of transitions out of inactivity. Moreover, they are found to be more persistent in unemployment as compared to the young, who are somewhat more likely to find either salaried and/or self-employment jobs. Household size proves to display two notable effects on labor market transitions. First, we find that the probability of remaining in informal-salaried employment increases with the household size, which stems from increased responsibility and financial needs coming with increased household size. Whereas, as household size increases the probability of moving from unemployment to both types of self-employment falls. Sector of economic activity appears to play a fairly significant role in explaining most of the transitions in the labor market. Most notably, we find that industrial workers are somewhat more likely to remain as formal-salaried, agricultural workers are less likely to move out of informal self-employment and construction workers display higher probability of becoming informal-salaried. The results, overall, signify the intrinsic nature of the given sector as an important determinant of the labor market flows.

In sum, Chapter 4 provides a detailed diagnosis of the mobility in the Turkish labor market. The market is observed to display a rather static structure throughout the period considered. This indicates that a well recognition of

underlying dynamics may help policy makers to produce various effective tools for addressing informality.

Having understood the underlying dynamics of labor mobility across formal/informal and employment/non-employment states, in Chapter 5, the aim is to complement the existing literature by examining the earnings performance of formal and informal workers in Turkey. In particular, we investigate if there is an informal sector earnings penalty that indicates the presence of segmentation in the Turkish labor market, how the earnings distribution across formal/informal sectors alters when employment is further broken down into wage-employment and self-employment, i.e. formal wage workers, formal self-employed, informal wage workers, informal self-employed and which individual, household and employment type characteristics drive the earnings gap? Following these lines of research questions, we analyze earnings differentials along multiple dimensions, disentangling at formal/informal, wage/self-employment and mean/quantiles of the earnings distribution.

First, OLS in levels estimation of standard Mincer earnings equations confirms the existence of an informal penalty, but also shows that almost half of this penalty can be explained by observable variables. When the sample is broken down by gender, the unexplained informal penalty for female workers is found as twice of that for the male workers when only individual characteristics are controlled, whereas when job variables are also introduced to the model, informal penalty for women appears at parity with that for male workers. Regarding formal/informal pay differences along wage/self-employment divide, formal-salaried workers are paid significantly higher than their informal counterparts. Moreover, confirming the heterogeneity within informal employment, self-employed are found to be subject to lower remuneration than those salaried.

Acknowledging the fact that earnings at the mean are not so informative and tend to conceal intrinsic heterogeneity within formal and informal sectors, we estimate quantile regressions which allows for a distributional analysis of the pay gap at

various points of the earnings distribution. Indeed, the results show that pay differentials are not uniform along the distribution. More specifically, we detect that informal penalty decreases with the earnings level, i.e., it is significant at the lower quantiles but either becomes insignificant or even turns into a premium at the top. The results, overall, confirm the basic premise of a heterogeneous informal sector upper-tier jobs carrying a significant premium that may compensate the benefits of formal wage work and lower-tier jobs being largely penalized. An important finding revealed by the distributional analysis is that, in contrast to the mainstream literature which views informal self-employed as the upper-tier and wage earners as the lower-tier, lower-tier informal employment in fact rather corresponds to self-employment in the Turkish labor market. The distributional pattern of earnings gap becomes even more discernible when the analysis is limited to female workers. Most notably, the 48 percent formal-salaried wage premium vis-a-vis informal-salaried at the lowest quantile turns into a 42 percent penalty at the top. This result also affirms the dual nature of informal sector.

Finally, we estimate fixed effects regression exploiting the panel nature of the data in order to account for time-invariant unobservable characteristics that are also deemed as important determinants of earnings levels. The results show that unobserved individual fixed effects when combined with controls for observable individual and employment characteristics explain the pay differentials between formal and informal employment entirely. Observable human capital, household and job characteristics, when combined with unobserved individual fixed effects (which may include ethnicity, geographical region of residence, socioeconomic status of one's mother/father, etc.) explain the formal/informal earnings gap to a large extent. Further breakdown of fixed effects analysis by gender also displays only a slightly significant informal wage penalty for male workers and no statistically significant formal/informal pay gap for female workers. When FE model is extended to incorporate salaried vs. self-employment divide, we observe three noticeable patterns. First, there is no evidence of a statistically significant earnings gap between formal and informal wage earners, but only for the male

sample which displays a slightly significant 10 percent formal premium. Second, formal self-employed workers display earnings premiums of 15 and 21 percents, respectively for all and male only samples. As for within informal employment, earnings differentials in favor of salaried work against self-employment ceases to exist when one accounts for time-invariant unobservables. The 40 percent earnings penalty for female informal self-employed, however, confirms the prior evidence that self-employment rather corresponds to lower-tier informal employment even after controlling for many observable and unobservable factors.

In sum, chapter 5 provides a comprehensive analysis of the formal/informal pay differentials in the Turkish labor market, thereby complementing the informality analysis. Using a panel data set and multiple econometric approaches, we detect an informal sector penalty, but once controlled for observable and unobservable effects the gap disappears entirely.

6.2. Policy Implications

The analyses undertaken in this thesis provides several implications for policy makers in designing policy to address labor informality and reduce its negative externalities. In this regard, one first notes the gender dimension of informality. More specifically, women are disproportionately over-represented in informal sector, and in lower paid jobs and hazardous occupational groups within informal employment. They are also more prone to work without any formal social protection. In addition, as clearly revealed by transition analysis, they seem to suffer higher barriers to entry into formal employment opportunities. In addition, our findings show that female workers are significantly disadvantaged in terms of labor market mobility. In particular, they are mostly found either in informal self-employment or inactive states, and have lower likelihood of transition into other types of employment. Earnings gap analysis confirms that they suffer substantially higher levels of informal earnings penalty compared to male workers. The two most important factors underlying these findings are women's traditional gender and intra-family roles and lower levels of education. Evidently,

it becomes exceptionally obvious that discrimination against women in the labor market in terms of employment and pay opportunities should be eliminated. For the first factor, policy makers should focus on reconciling women's responsibilities arising from the work and the family. This can be achieved via labor market policies ranging from providing childcare to enabling more flexible work routines, and to strengthening women's financial and legal independence. On the other hand, active labor market policies, which target improving the education and skill levels of women, are extremely crucial to increase women's employment opportunities and standards. Also, tax incentives or social security premiums can be used to enhance formal employment of women.

Along the age dimension of informality, our results reveal that the young and older age groups typically display a greater likelihood of being informally employed, whereas the nature and underlying factors, hence implications for policy of young and elderly informality are quite different. Young and less experienced workers are more prone to working informally as they often suffer from barriers to entry into formal employment opportunities. Moreover, they are also the least likely age group to maintain formal employment, and often the first to be affected in case of a lay-off. These stem from young workers being on average less productive and less certain to employers, so that they are typically *excluded* from formal employment. An active labor market policy to address this type of informality could target investing in their education and skills development. Also passive policies such as levying exemptions or at least a reduction in employer social security contributions for the newly hired young workers, which has recently been started to be implemented by the Government of Turkey, might contribute to alleviate the epidemic of young informality.

At the other end of the spectrum, old informality is a rather structural issue related to Turkish employment regulations. Namely, generous pension schemes induce an epidemic of early retirement after which elder individuals often move into informal types of employment, thereby aggravating informality at older ages. In this regard, the policy challenge is to eliminate incentives for retirement at an early age and continue working informally afterwards.

Our results, overall, pinpoint a strong negative relationship between education and informality; thereby affirm that addressing education and human capital carries utmost importance for reducing the levels and adverse consequences of informal employment. Improving the quality of the education system in a way to enhance the skills and productivity of the labor force, through Active Labor Market Programs (ALMPs) such as fostering vocational education, skills acquisition, occupational and career consultancy, will strengthen the bargaining power of workers on issues such as wages, social security, working hours and conditions, and increase their likelihood of formal employment (World Bank, 2010, p. 55). These policies should particularly address skill mismatches of the labor force with demands of employers/jobs by well-designed upskilling programs, and improve links between schools and the labor market (OECD, 2010, p.131).

In informal engagements, the party who impose informality is typically the employers. Given their relatively lower levels of bargaining in the presence of high unemployment and poverty levels, employees do not have a chance but to consent with what they are offered for. This becomes particularly graver for low-skill and low-wage segments, which indeed constitute a sizable share of the labor force as revealed by our analysis. In this regard, encouraging and/or forcing employers into formality play a major role. As we have discussed in Chapter 2, Turkey's labor regulations and costs are high by international comparison. In order to avoid costly labor market regulations, employment protection laws, limitations on temporary contracts, high levels of social security and unemployment insurance premiums and severance payments, employers opt for informal employment. Therefore, an effective policy to deal with informality should focus on making formalization less costly for employers, which can ben achieved by reducing the tax wedge, social security and other employment-related contributions, or liberalizing temporary contracts. On the other hand, this can also be accomplished by making informality more costly for employers via improving and strengthening auditing mechanisms or enforcing deterrent punishments such as monetary sanctions, license revocations, ban of operations, prison sentences.

At the other side of the coin, workers' reluctance to get under the umbrella of formal protection may also be contributing to informality. This is most likely due to two factors. First, workers might perceive social protection provided by the State to be inefficient and of poor quality, hence voluntarily opt out of formal employment based on their own cost-benefit analysis. As Perry et al. (2007, p. 2) well argues: "A poor worker, excluded from health care services because he or she lives in a remote rural area or a poor urban neighborhood, may see little point in being formal and paying labor taxes for services to which he or she never no access". Therefore, policy makers should focus on designing more effective social protection programs, which provide better support and coverage to increase incentives for formal employment. If individuals believe that they will receive high quality social protection and other public services in exchange of what they pay for them, they will voluntarily opt for formal economic activities. Second, fear of losing jobs given the high unemployment rates and ease of replacing workers for employers, restrain these workers from asking for social security from their employers. This second factor is accentuated more for the vulnerable groups, such as the poor, women and the young. The challenge for policy makers, in this regard, is to maintain a well-regulated strong social protection system which supports and guards workers' rights and protections, especially for the vulnerable segments such as women, young, unskilled and poor.

As pinpointed by definition, mobility and earnings analysis in this thesis, informality is mostly a small-firm phenomenon. Given that a great majority of the establishments is comprised of small and medium size enterprises in the Turkish private sector, informality problem is significantly aggravated. Small firms typically suffer from lower productivity levels, and experience difficulties in surviving in the formal sector given its costs. The policy challenge is to bring these firms under the umbrella of the formal system, both by reducing its costs and increasing its benefits. In this regard, the state can provide training and technical help, access to finance and other types of incentives to these small firms conditional on formalization.

One of the most evident conclusions drawn from our analyses is the role of agriculture in determining the extent and trends of informality in the Turkish labor market. The World Bank also affirms this fact in a recent report on informality in Turkey as "one of the main determinants of informality in Turkey is the high share of agriculture in the economy, where informality is highest." (World Bank, 2010, p. iv). The gradually decreasing share of agricultural activities in the aggregate economy over time reduces informality to a large extent. On the other hand, policy makers can also address the almost exclusively informal nature of the sector through efforts on formalizing the agricultural activities. In particular, unpaid family workers who are mostly those uneducated, poor, female workers should be brought under the social protection system of the government. These workers mostly correspond to those with only limited or no mobility to other employment states, and lower-tier of the informal employment with inferior earnings, hence should be carefully addressed.

Confirming the traditional view, our study has confirmed that informal workers are found as the most adversely affected in times of recessions and crisis. Therefore, taking proactive measures against a wide range of risks which face these workers, carry great importance. More specifically, policy makers should extend social safety nets in times of crisis and facilitate re-employment mechanisms. It should also be mentioned here that creating a stable macroeconomic environment, which nurtures employment opportunities, is of critical importance for preventing the adverse effects of economic downturns on those vulnerable segments of the labor market.

6.3. Recommendations for Future Research

The analysis undertaken in this thesis covers the time period between 2006 and 2009, since the micro panel data set for the following years are not yet released. Future research might extend the analysis to the present as data become available, and further scrutinize the implications of the 2008 global economic crisis on the informality dynamics of the Turkish labor market. More specifically, the impacts

of the crisis on labor mobility and earnings differentials along the formal/informal divide can be analyzed with more definitive evidence.

Agricultural informality stands at above 90 percent in the Tukish labor market. In the mobility analysis, we have only conducted multinomial estimation for total employment due to presentational brevity purposes. A further study could focus particularly on the implications of agricultural employment on overall mobility patterns. It would also be interesting to exclude agriculture, and concentrate on the urban worker flows which could provide further insights on informality dynamics.

A further study comparing the results obtained in this thesis with other countries' experiences, such as OECD or the European Union members, would be of great interest to policy makers. In this way, dynamics, causes and consequences, and coping mechanisms of informality in different labor markets can be compared and contrasted, which will enhance more rigorous policy implications.

In earnings analysis, we have not performed any statistical selection procedure, but relied on the panel nature of our data set. Econometric techniques accounting for selection bias inthis type of analysis, i.e. Heckman Selection Procedure, are not yet standard in econometric software packages. It is recommended that further research should apply a selection bias identification and correction technique in order to check the robustness of the analysis.

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APPENDIX B

TURKISH SUMMARY

Çağımızın önde gelen iktisadi ve sosyal sorunları arasında yer alan işgücü piyasasında kayıtdışılık konusu, niteliği ve sürekliliği, neden ve sonuçları ile küresel ve ulusal kalkınma gündemlerinde önemli bir yer tutmaktadır. İktisat yazınında kayıtdışılığın boyutlarını ölçen, neden ve sonuçlarını irdeleyen, uluslararası karşılaştırmalar yapan ve politika yapıcıları için iktisadi modeller geliştiren çok çeşitli çalışmalar bulunmaktadır. Öte yandan, kayıtdışı istihdam kavramının çok boyutlu ve muğlak bir yapıda olması ve buna bağlı olarak kayıtdışılığın tam anlamıyla ölçümünün imkansızlığı, bu konuda sağlıklı analizler yapılmasını güçleştirmektedir. Kayıtdışı istihdam, diğer birçok gelişmekte olan ülkede olduğu gibi Türkiye'nin de önemli bir sorunudur. Ancak, bu alanda Türkiye üzerine yapılan çalışmaların sayısı bir hayli kısıtlıdır. Bu çalışma, Türk işgücü piyasasında kayıtdışılık yazınına katkı yapmak üzere hazırlanmıştır. Çalışmada, Türkiye'de son derece yaygın olan kayıtdışılık probleminin tanımı, ölçümü, kayıtlı ve kayıtdışı işgücü durumları arasındaki işgücü hareketlilikleri ve ücret farklılıkları kapsamlı bir biçimde ele alınmaktadır.

Kayıtdışılık kavramı, 1970'lerde ilk olarak ortaya atıldığında, ülkelerin iktisadi ve sosyal kalkınma düzeyinde belli bir eşik değere ulaştıktan sonra ortadan kalkması beklenen bir olguyu ifade etmek üzere kullanılmıştır. Ancak, aradan geçen 40 yıl bu yaklaşımın gerçeği yansıtmadığını göstermiştir. Hızlı bir biçimde kalkınmakta olan ülkelerde bile kayıtdışılığın devam ettiği gözlenmiştir. Böylelikle, sorunun esasında çok daha geniş boyutlu olduğunu söylemek mümkündür. Bu çerçevede değerlendirildiğinde, kayıtdışı istihdam konusunun, özellikle gelişmekte olan ülkelerde, daha iyi anlaşılması son derece önemlidir.

Kayıtdışılıkla ilgili ilk altı çizilmesi gereken unsur, geçtiğimiz 40 yılda yayınlanan çok sayıda çalışmaya rağmen üzerinde tüm kesimlerin fikir birliğine vardığı tek bir kayıtdışı istihdam tanımının olmamasıdır. Kayıtdışılık, kayıtdışı işçilerden kayıtdışı firmalara, ücretsiz aile işçileri ya da mikro ölçekli kendi hesabına çalışanlardan varlıklı işverenlere kadar çok çeşitli işçi ve çalışma şekillerini betimlemek üzere kullanılabilmektedir. Kayıtdışılık kavramının muğlaklık ve çeşitlilik içeren yapısı Perry ve ark. (1997, p. 21) tarafından kapsamlı bir şekilde ele alınmaktadır. Söz konusu çalışmada, kayıtdışılığın anlamının kişiden kişiye değiştiği vurgulanmaktadır. Kayıtdışılığın, insanların zihinlerinde, sosyal güvenlikten yoksun olan işgücü, düşük verimlilik, haksız rekabet, hukuk dışılık, vergilerin az veya hiç ödenmemesi gibi olumsuz çağrışımlar yaptığı belirtilmektedir. Kayıtdışılıkla ilgili araştırmalarda, kabul edilen tanıma göre kullanılan yöntem ve ulaşılan sonuçlar farklılıklar gösterebilmektedir.

İkinci olarak ise, kayıtdışı faaliyetler özellikle gelişmekte olan ülkelerde milli gelir ve istihdamın büyük bir kısmını oluşturmaktadır. Uluslararası İşgücü Örgütü (İLO) gelişmekte olan ülkelerin üçte ikisinde, kayıtdışı istihdamın tarım dışı istihdama oranının yüzde 40'ın üzerinde olduğunu ifade etmiştir. Yine, İLO'nun 2011 verilerine göre, kayıtdışı istihdamın toplam tarım dışı istihdam içerisindeki payı Peru, Hindistan ve Pakistan gibi ülkelerde yüzde 70'in üzerine çıkmaktadır. Bu ülkelerdeki düşük işgücüne katılım oranlarıyla birlikte düşünüldüğünde, kayıtdışılık oranları çok daha çarpıcı bir nitelik kazanmaktadır.

Diğer birçok gelişmekte olan ülkede olduğu gibi işgücü piyasasında kayıtdışılık Türkiye için de son derece büyük bir problemdir. Türkiye İstatistik Kurumu'nun açıkladığı Ocak 2012 verileri itibariyle, Türk işgücü piyasasındaki kayıtdışı istihdam oranının yüzde 38,4 olduğu görülmektedir. TÜİK, herhangi bir sosyal güvenceden yoksun biçimde çalışanları kayıtdışı olarak tanımlamaktadır. Bu tanımı kullanarak yapılan hesaplamalar, Türkiye'de verimliliğin ekonomi geneline kıyasla son derece düşük olduğu tarım sektöründe söz konusu oranın yüzde 82,8'e ulaştığını göstermektedir. Tarım dışı istihdam içinde kayıtdışı olarak çalışanların oranı ise yüzde 25,8 olarak hesaplanmıştır. Bu veriler ışığında, kayıtdışılığın Türk

işgücü piyasasında son derece yaygın olduğunu söylemek mümkün görünmektedir.

Kayıtdışılık meselesinde altı çizilmesi gereken üçüncü unsur, kayıtdışılığın çoğunlukla olumsuz dış şoklara karşı en zayıf olan gruplarda yaygın olduğu görülmektedir. Bu çerçevede, kayıtdışılık, düşük beceri ve tehlike içeren işlerle ilişkilendirilir. Buna ek olarak, gençler ve kadınlar gibi işgücü piyasasındaki konumları itibariyle dezavantajlı olarak sınıflandırılabilecek gruplarda kayıtdışılığın daha yaygın olduğu görülmektedir. Kayıtdışılığın yaygınlık derecesinin, toplum kesimleri arasında farklılaştığı göz önünde bulundurulduğunda, kayıtdışı istihdamın taşıdığı risk ve sosyoekonomik eşitsizlik faktörlerini tespit etmek ve bunların toplumsal refah, eşitlik ve yoksulluk gibi olumsuz sonuçlarını en aza indirecek politikaların tasarlanması ve hayata geçirilmesi son derece önemlidir.

Bu çalışma, kayıtdışılık yazınına üç temel katkı yapmayı hedeflemektedir. Bunlardan birincisi, kayıtdışı istihdamı tanımlama ve ölçmede kullanılan farklı yaklaşımları Türkiye örnekleminde değerlendirmek ve karşılaştırmaktır. Bu analizle kayıtlı/kayıtdışı işgücü piyasaları teorisinin tarihsel gelişimini dikkate alarak, ampirik ve teorik literatürün bir sentezinin ortaya koyulmasi hedeflemektedir. Yine bu bölümde, 2008 küresel ekonomik krizinin Türk işgücü piyasasındaki kayıtdışılık eğilimleri üzerindeki etkisi de incelenecektir. Bu kapsamda ortaya konulan analizlerin amaci, kayıtdışılıkla mücadele icin üretilecek politikaların tasarımına malumat desteği vermektir.

İkinci olarak, literatürdeki ilk çalışmaların çoğu durağan ve toplamcı yaklaşımlar kullanılarak yapılmıştır. Ancak, gelişmiş panel veri setleri ve tekniklerinin ortaya çıkması ile beraber daha detaylı, kapsamlı ve açıklayıcı analizler mümkün hale gelmiştir. Bu çerçevede, işgücü hareketliliği (labor mobility) analizi ile farklı işgücü piyasası durumları arasındaki çalışan gecişkenlikleri dinamik olarak izlenebilmektedir. Çalışmada kullanılan temel veri seti sayesinde, Türkiye'de ilk defa bu çalışmada Turkiye'deki işgücü hareketliliği kayıtlı/kayıtdışı bağlamında

incelenmektedir. Çalışmada, çalışma (employment) ve çalışmama (non-employment) başta olmak üzere farklı işgücü piyasası durumları arasındaki çalışan hareketlerinin boyutu ve niteliği ortaya koyulmaktadır. Buna ek olarak, bireylerin kişisel özelliklerinin (yaş, cinsiyet, eğitim iş deneyimi, hanehalkı yapısı, çalışılan sektör) işgücü piyasası durumları arasındaki geçişkenlik ihtimalleri üzerindeki etkileri incelenmektedir.

Üçüncü olarak ise, yine bildiğimiz kadarıyla, bu çalışma panel veri ve teknikleri kullanılarak kayıtlı ve kayıtdışı istihdam arasındaki ücret farklılıklarını inceleyen ilk çalışma niteliğini taşımaktadır. Bilhassa, Türk işgücü piyasasında bölünmüşlük (segmentation) olduğuna işaret eden, kayıtdışı işgücünün aleyhine bir ücret ayrımcılığı olup olmadığını test etmek amaçlanmaktadır. Ayrıca bu çalışma, ücret farklılıklarını sadece kayıtlı/kayıtdışı değil aynı zamanda ücretli/kendi hesabına çalışma ayrımında ve ücret dağılımının farklı noktalarında da inceleyerek, kayıtlı ve kayıtdışı sektörlerdeki potansiyel heterojeniteyi da hesaba katmaktadır.

Bu çalışmada kullanılan veriler TÜİK'in 2006, 2007, 2008 ve 2009 yıllarında gerçekleştirdiği Gelir ve Yaşam Koşulları Araştırması'ndan (GYKA) elde edilmiştir. GYKA veri setinin oldukça yeni olması, panel niteliği ve zengin bilgi içeriği çalışmamızı bugüne kadar yapılan kayıtdışılık çalışmalarından ayıran temel unsurların başında gelmektedir. Ankette, hanehalkı ve bağlı fertlerin çalışma statüsü, sosyal güvenliği olup/olmama durumu, yaşam koşulları, iş özellikleri, çalışma saatleri, emek ve diğer gelirleri, demografik özellikleri ve sosyoekonomik şartları ile ilgili detaylı bilgiler yer almaktadır. Anket sonuçları her yıl kesit-veri ve panel-veri olarak iki şekilde yayınlanmaktadır. Orijinal kesit-veri örneklem büyüklüğü 2006 için 30186 kişi; 2007 için 30263 kişi; 2008 için 31121 kişi ve 2009 için 32539 kişiden oluşmaktadır. Çalışmamızdaki analizler bu dört yıl kullanılarak yapılmıştır, zira ileriki tarihlere ait veriler henüz yayınlanmamıştır.

Çalışma üç ana bölümden oluşmaktadır. Bunlardan birincisi, kayıtdışı istihdam kavramının farklı tanım ve ölçme yaklaşımlarının, Türk işgücü piyasasında değerlendirilmesi, karşılaştırılması ve sonuçlarının incelenmesi ile ilgilidir. Zira

kayıtdışı istihdam için uluslararası olarak kabul edilmiş tek bir tanım olmamakla birlikte, farklı zaman ve yer bağlamları için uyarlanmış birçok tanım ve ölçüm çeşidi bulunmaktadır. Analizlerlerin kullanılan tanımlara göre farklı sonuçlar doğuracağı düşüncesiyle, ilk çalışmada amaç Türk işgücü piyasasında kayıtdışı istihdam konusu ve politikaları ile ilgili yapılacak çalışmalara baz oluşturacak, kapsamlı ve bütünsel bir kavramsal çerçeve ortaya koymaktır. Ayrıca, bu analiz kayıtlı/kayıtdışı işgücü piyasaları teorisinin tarihsel gelişimi ile ilişkilendirilmek suretiyle ampirik ve teorik literatürün bir sentezini sunmaktadır.

Kayıtlı/kayıtdışı istihdam ayrımı, iktisadi kalkınmayı geleneksel sektörlerden (özellikle tarım) modern sektörlere (sanayi ve hizmetler) işgücü geçişleriyle açıklayan Lewis (1954), Kuznets (1955) ve Harris ve Todaro (1970)'ya kadar uzanmaktadır. Hart (1973) ise, ekonomiyi modern ve geleneksel sektörlere karşılık gelecek şekilde kayıtlı ve kayıtdışı sektörlere ayırmak suretiyle, kayıtdışılık terimini ilk kez terminolojiye kazandıran isimdir. Hart bu terimi küçük ölçekli ve kendi-hesabına çalışan, kentlerdeki işsiz ve eksik istihdam grubu için kullanmıştır. Bu yaklaşımdan yola çıkan ilk resmi tanım ise ILO tarafından 1972 yılında ortaya konmuştur. Bu tanım çerçevesinde, kayıtdışılık girişim son derece kolay olduğu, kamusal düzenlemelerin dışında olan piyasalarda yaygındır. Emek yoğun faaliyetleri düşük becerili işgücüyle gerçekleştirebilen küçük ölçekli ve aile işletmeleri ile kayıtdışılık kavramı İLO tanımında ilişkilendirilmiştir. Kayıtdışı işgücü piyasalarına dair ilk teori olan geleneksel (traditional), segmentasyon (segmentation) veya dışlanma (exclusion) yaklaşımları bu tanımlar üzerine kurulmuştur.

Geleneksel teori kayıtdışılığı, kayıtlı istihdam olanaklarının sınırlı olduğu durumlarda dezavantajlı kişilerin yaşamlarını sürdürebilmek adına başvurduğu alternatif olarak görmektedir. Ayrıca, kayıtlı ve kayıt dışı piyasalar aralarında sınırlı ya da sıfır geçişkenlik olan ayrı birimler olarak değerlendirilmektedir. Bu segmentasyon, efektif denge ücret mekanizmalarının (wage-setting mechanism) işlemesini engelleyen, kayıtlı işgücü piyasasındaki yapısal ve düzenleme kaynaklı katılıklara dayandırılmaktadır. Özetle, bu yaklaşımda kayıtdışılık kayıtlı sektör

için kuyruğa giren işçilerin geçici olarak mecbur kaldığı ve her anlamda kayıtlı istihdamdan kötü olan bir durumu ifade etmektedir. Geleneksel teori, daha sonra açıklayıcıdan ziyade betimleyici bir yaklaşım kullandığı, katı bir kayıtlı/kayıtdışı ayrımı içerdiği, kayıtdışılığı geçici ve tamamıyla istenmeyen, görece aşağı bir kavram olarak gördüğü için eleştirilmiştir.

Geleneksel teoriye alternatif olarak çıkış teorisi (exit theory) geliştirilmiştir. Bu teoride, kayıtdışı çalışmanın firma ve işçilerin kendi kar-zarar analizlerine dayanarak gönüllü ve bilinçli bir alternatif olarak da tercih edilebileceği ortaya konulmuştur. Özetle bu yaklaşım, devlet tarafından sağlanan sosyal güvenceyi yetersiz bulan veya katı çalışma kurallarına tabi olmak istemeyen kişilerin, çoğunlukla girişimciliğe dayalı kayıtdışı çalışma tiplerini kendileri için daha yararlı bulabileceğini öngörmektedir. Daha sonrasında ise, Fields (2005), geleneksel ve çıkış yaklaşımlarının bir sentezi olan üçüncü bir başka görüşü ortaya koymuştur. Buna göre, kayıtdışı sektör aslında heterojen bir yapı göstermekte ve geleneksel görüşle örtüşen alt-katman (lower-tier) ile rekabetçi piyasa özellikleri gösteren üst-katman (upper-tier) olacak şekilde ikili bir yapıya sahip bulunmaktadır.

Bahsettiğimiz teorik çerçeve doğrultusunda, kayıtdışı istihdam kavramının tanım ve ölçüm şekilleri de zaman içerisinde kendi evrimini göstermiştir. Bu evrim temel olarak, kayıtdışılığın istisna ya da temel; geçici ya da daimi; kentsel ya da kırsal; mikro ölçekli ya da büyük ölçekli firmalarda; kayıtlı sektörle bağlantılı ya da bağlantısı olmayan; düşük ya da yüksek verimlilikli; ücret ile alakalı ya da alakasız, yasal ya da yasadışı bir olgu olup olmadığı ikilemleri üzerinde yoğunlaşmıştır. Söz konusu çerçevede ampirik ve teorik literatürde çok sayıda tanım oluşturulmuştur. Bu tanımlardan üçü İLO tarafından resmi olarak belirlenmiştir.

İLO ilk olarak, 1993'te kayıtdışılığı küçük ölçekli firmalardaki çalışanlar veya kendi-hesabına çalışanların toplamı olarak tanımlamıştır. Bu yaklaşım literatürde firma tanımı (enterprise definition) olarak adlandırılmaktadır. Öte yandan, firma

tanımı, tam net olmadığı ve birçok kayıtdışı iktisadi etkinliği kapsayamadığı gerekçesiyle eleştirilmiştir. Bu eleştirilere cevaben İLO, 2003 yılında, kayıtdışılık tanımını firma odaklıdan (enterprise-based) ziyade iş odaklı (job-based) olacak şekilde yeniden düzenleme ihtiyacı duymuştur. Yeni tanıma göre kayıtdışılık, kayıtdışı firmalarda kendi-hesabına çalışanlar (küçük ölçekli firma çalışanları, işverenler ve ücretsiz aile işçileri) ile kayıtdışı işlerdeki ücretli çalışanlardan (kayıtdışı firmaların çalışanları, yevmiyeli ve aile işçileri) oluşmaktadır. Firma ve iş özelliklerini birleştiren bu tanım, literatürde üretim tanımı (productive definition) olarak geçmekte ve birçok çalışmada farklı varyasyonlarıyla kullanılmaktadır.

Son yıllarda, veri kaynakları ve kalitesindeki artış, daha tekbiçim ve karşılaştırılabilir bir tanıma ihtiyaç duyulması sebebiyle, firma/iş odaklı tanımdan işçi odaklı bir tanıma geçilmiş ve kayıtdışılığın sadece kayıtdışı sektörde gerçekleşen istihdamla sınırlı bırakılmayıp, kayıtlı sektörde de çeşitli formlarda yer alabilecek bir kavram olarak ele alınması istenmiştir. Özet olarak kayıtdışılık, çalışılan işin yasal statüsüne, iş hukuku ve düzenlemelerine bağlı olup olmamasına, sosyal güvenliğe kayıt olup olmamasına göre belirlenmektedir. Bu tanım legalistik (legalistic), kontrata-dayalı (contract-based) veya sosyal güvenlik (social security) tanımı olarak nitelendirilmektedir.

Bu teorik ve ampirik literatür çerçevesinde, ilk çalışmada üç farklı kayıtdışı istihdam tanımı belirlenmiştir. Bunlardan ilki olan Tanım A, 10 ve daha az sayıda kişiden oluşan iş yerlerinde işveren ve işçi olarak çalışanlar, kendi-hesabına (idari, profesyonel ve teknisyen meslek grupları hariç tutularak) veya ücretsiz aile işçisi olarak çalışanların tamamını kayıtdışı olarak tanımlamaktadır. Bu yaklaşımda kayıtdışılık, çalışılan iş yerinin ve işin özellikleri üzerinden belirlenmektedir. Bu sebeple bu tanımın firma ya da üretim yaklaşımlarına karşılık geldiğini söylemek mümkündür. Bu tanım çerçevesinde, büyük ölçekli firmalardaki istihdam kayıtlı olarak kabul edilmektedir. Bu şekilde bakıldığında, Tanım A, kayıtdışı sektördeki istihdam anlamına gelmektedir. Tanım B ise, Tanım A'ya göre kayıtlı sektörde çalışan ancak sosyal güvenlik sisteminde kayıtlı bulunmayan kişilerin, kayıtdışı

istihdama dahil edilmesini öngörmektedir. Böylelikle, Tanım B'nin kayıtdışı tanımı Tanım A'ya göre daha geniş olmaktadır. Son olarak, Tanım C sosyal güvenliğe kayıtlı olan çalışanları kayıtlı, olmayanları ise kayıtdışı istihdam olarak sınıflandırmaktadır. Bir diğer ifadeyle, Tanım C kayıtdışılığı tanımlarken çalışanların özelliklerini temel almakta, yani sosyal güvenlik tanımına karşılık gelmektedir.

Çalışmanın ilk bölümünde, Türk işgücü piyasasındaki kayıtdışılık, üç ayrı tanım çerçevesinde, yaş, cinsiyet, eğitim, coğrafi alan, iktisadi sektör, iş yeri büyüklüğü ve çalışma tipi gibi birçok boyutta incelenmektedir. Turkiye'deki kayıtdışı istihdamın nitelik ve yapısı detaylı olarak analiz edilmektedir. Bu bölümün ilk göze çarpan sonucu, sosyal güvenlik üzerinden tanımlanan kayıtdışı istihdam oranının, iş yeri özellikleri üzerinden yapılan diğer iki tanımı kullanarak yapılan hesaplama neticesinde elde edilen değerden yaklaşık 10 puan düşük olmasıdır. Bu fark Türk işgücü piyasasındaki istihdamın büyük bir kısmının küçük ölçekli firmalarda veya kendi hesabına olmasının bir sonucu olarak görülebilir. Bir diğer önemli bulgu, sosyal güvenlik tanımının, kayıtdışı istihdam üzerindeki zaman ve kriz etkilerine karşı daha duyarlı olmasıdır. Nitekim, Tanım C'ye dayalı kayıtdışı istihdam oranı 2006-2008 döneminde azalmakla birlikte, küresel ekonomik krizin etkilerinin Türkiye piyasalarında hissedilmeye başlandığı 2009 yılında sınırlı da olsa bir artış kaydetmiştir. Tanım A ve B'de ise kayıtdışı istihdamın zaman içerisindeki değişkenliğinin oldukça sınırlı olduğu görülmektedir. Öte yandan, kullanılan tanıma bağlı olmaksızın tarım dışı istihdamdaki kayıtdışı istihdamın payının, toplam istihdam içerisindeki payına göre yaklaşık yüzde 10-15 daha düşük olduğu görülmüştür, ki bu Türk işgücü piyasasının stilize gerçeklerinden (stylized facts) biri olan tarımsal istihdamdaki kayıtdışılığın ağırlığını desteklemektedir.

Kayıtdışılık bireylerin demografik ve işgücü piyasasındaki durumları itibariyle incelendiğinde, kayıtlı/kayıtdışı işgücü piyasalarına dair birçok dikkat çekici sonuca ulaşılmaktadır. Cinsiyet bağlamında bakıldığında, kadınlar arasındaki kayıtdışılığın erkeklere kıyasla, kayıtdışı tanımlarının tümünde, daha yaygın

olduğu görülmektedir. Bu durum, Turkiye'deki kadınların işgücü piyasasında erkeklerden kıyasla oldukça dezavantajlı bir konumda olduklarını göstermektedir. Kadınlar küçük ölçekli işletmelerde ya da ücretsiz aile işçisi olarak istihdam edilmektedirler.

Bireylerin yaşları itibariyle bir değerlendirme yapıldığında ise hangi tanımın kullanıldığından bağımsız olarak, kayıtdışılık ile yaş arasında U-şekilli bir ilişki ortaya çıkmaktadır. Öte yandan, gençler (15-24 yaş grubu) arasındaki kayıtdışılık diğer yaş gruplarında olduğuna kıyasla, sosyal güvenlik tanımına göre hesaplandığında, firma tanımına bağlı kalarak yapılan hesaplamaya göre daha yüksek çıkmaktadır. Bu bulgu genç çalışanların ilk başlarda sosyal güvenliğe kayıtlı olmadan çalıştırıldıklarını, zaman içerisinde, tecrübe kazandıkça kayıtlı hale geldiklerini öngören geleneksel anlayışı doğrulamaktadır.

Orta yaşlı çalışanlar ise en fazla sosyal güvenliğe kayıtlılık oranına sahip olan ve zaman içerisinde kayıtdışılık oranlarında en az değişkenlik gösteren grup olarak, geleneksel teoriyi desteklemektedir. Bir diğer çarpıcı sonuç ise 55-64 yaş grubunda yer alan çalışanların, kullanılan tanım fark etmeksizin, önemli ölçüde kayıtdışı olduklarıdır. Bu grubun mensupları, kayıtdışı iş yerlerinde (10 veya daha az işçi barındıran firmalar, ücretsiz aile işçiliği veya kendi-hesabına çalışma) çalışmaya ve sosyal güvenlik sistemi dışında çalışmaya daha yatkındırlar.

Bir diğer unsur olan eğitim ele alındığında, kullanılan tanım fark etmeksizin, kayıtdışılık ile eğitim derecesi arasında oldukça kuvvetli bir negatif ilişki olduğu görülmektedir. Bu sonuç kayıtdışılığı temelde bir düşük beceri hadisesi olduğu temel prensibini haklı çıkarmaktadır. Bu sonucu destekleyen bir diğer bulgu ise lise ve üniversite mezunlarında, kayıtdışı istihdam oranının zaman içerisinde hemen hemen hiç değişkenlik göstermediğidir. Kayıtdışılığın iktisadi sektör ve meslek grupları bazında ayrıştırılması da birçok çarpıcı sonuç ortaya koymaktadır.

Bireylerin demografik özelliklerinin ve işgücü piyasasındaki konumlarının kayıtdışı olma olasılığını nasıl etkilediğinin belirlenmesi, kayıtdışılık probleminin

nedenlerinin ortaya çıkarılması için son derece önemlidir. Çalışmada, bireysel özelliklerin kayıtdışı olma olasılığı üzerindeki marjinal etkilerini incelemek için probit regresyon tekniği uygulanmıştır. Genel olarak sonuçlar sosyal güvenliğe dayalı tanımın kişisel ve çalışma karakteristik özellikleri ile kayıtdışılık arasındaki ilişkiyi en iyi şekilde yansıttığına işaret etmektedir. Örneğin, kadın olma ve kayıtdışılık arasındaki sıkça dile getirilen pozitif ilişki, firma tanımları kullanıldığında istatistiki olarak anlamsız çıkmaktadır. Ancak sosyal güvenlik tanımı kullanıldığında cinsiyetin kayıtdışı olma olasılığı üzerindeki etkisinin istatistiksel olarak anlamlı olduğu sonucu ortaya çıkmaktadır. Bu şekilde yapılan analizler kadın olmanın kayıtdışı olma ihtimalini arttırdığını ortaya çıkarmaktadır.

Yaş açısından değerlendirildiğinde, orta yaşlı bireylerin kayıtdışı olma olasılığının, referans grup olan gençlere kıyasla, bütün tanımlar altında, daha düşük olduğu görülmektedir. Öte yandan, orta yaşın üzerindeki çalışanlar için bulgular çelişkilidir. Firma tanımı kullanıldığında bu kişiler gençlere göre daha düşük kayıtdışında kalma olasılığı göstermekte, ancak sosyal güvenlik tanımı altında gençlerle aynı olasılığa sahip çıkmaktadır.

Tanımlar itibariyle kayıtdışı olma olasılıklarında en belirgin farklılık eğitim faktörü ele alındığında gözlemlenmektedir. Firma tanımı kayıtdışılık ile eğitim arasında müspet teoriye aykırı bir ilişki öngörmekteyken, sosyal güvenlik tanımı beklentileri karşılayarak teoriyi doğrulamaktadır. Hanehalkı karakteristik özellikleri de, aynı şekilde, sadece sosyal güvenlik tanımı altında istatistiksel olarak anlamlı kayıtdışılık olasılıkları taşımaktadır. Buna göre, evli çalışanların ya da çocuksuz olan çalışanların kayıtdışı olma olasılığı diğerlerine göre istatistiksel olarak daha düşüktür. Bulgular, açık bir şekilde, kişilerin çalışma kararları üzerinde, artan aile sorumluluğu ve güvenli çalışmaya duyulan ihtiyacın artması gibi geleneksel aile etkisini işaret etmektedir.

Son olarak, iktisadi sektör ile kayıtdışı olma olasılığı arasındaki ilişki incelendiğinde, firma ve sosyal güvenliğe bağlı tanımların oldukça farklı sonuçlar verdiği görülmüştür. Bunlardan en çarpıcı olanı, tarım sektörünün sosyal güvenlik

tanımı altında çok yüksek kayıtdışı olma olasılığı taşımasına rağmen firma tanımı altında bu ilişkinin anlamsız çıkmasıdır. Nitekim, hem geleneksel teoride hem de Türk işgücü piyasasının stilize gerçekleri arasında başta gelen kabullerden biri kayıtdışılığın çok büyük ölçüde tarımsal aktiviteler içinde gerçekleştiğidir.

Çalışmanın bir sonraki bölümünde, panel veri setleri ve tekniklerinin araştırmacıların kullanımına sunulmasıyla birlikte analizi mümkün hale gelen işgücü hareketliliği, kayıtlı/kayıtdışı istihdam çerçevesinde ele alınmaktadır. Amaç, çalışanların farklı işgücü piyasası durumları arasındaki geçişlerinin boyutlarını ve niteliğini ve altında yatan faktörleri ortaya çıkarmaktır. Böylelikle Türk işgücü piyasalarındaki geçişkenlik ve kayıtdışılık ile ilgili sınırlı ampirik literatüre katkı yapılması hedeflenmektedir. Bu doğrultuda, ilk olarak 2006-2007, 2006-2008 ve 2006-2009 yılları arasında gerçekleşen iki, üç ve dört yıllık işgücü piyasası geçişleri olasılıkları, Markov Zinciri (Markov Chain Transition) yaklaşımı ile hesaplanmıştır. Bu analiz toplam, kadın ve erkek alt örneklemleri ile toplam ve tarım dışı istihdam örneklemleri için ayrı ayrı tekrarlanmıştır. Bu bölümde yapılan analizler, altı temel işgücü piyasası durumu tanımlanarak yapılmaktadır. Bunlar kayıtlı-ücretli, kayıtdışı-ücretli, kayıtlı-kendi hesabına, kayıtdışı-kendi hesabına, işsiz ve işgücüne dahil olmayan durumlarından oluşmaktadır.

Geçişkenlik analizlerine bakıldığında ilk dikkati çeken, işsizler haricindeki işgücü piyasası durumlarında olan bireylerin zaman içinde farklı işgücü durumlarına geçiş eğilimlerinin oldukça sınırlı olduğudur. Bu bulgu, Türkiye'deki işgücü piyasasının oldukça durağan bir yapıda olduğunu işaret etmektedir. Gözlemlenen geçişlerin yön ve derecelerine bakıldığında, aşağıdaki sonuçlar son derece dikkat çekicidir.

- Kayıtlı-işgücü hale geçişlerin oldukça sınırlı olduğu görülmüştür. Bu bulgu kayıtlı sektöre giriş yapmayı engelleyen bariyerlerin varlığına ya da kayıtlı istihdamın tercih sebebi olduğuna işaret etmekte, bir diğer deyişle geleneksel kayıtlı/kayıtdışı istihdam teorisini desteklemektedir.

- Kayıtdışı-ücretli çalışanların kayıtlı-ücretli çalışanlara göre çok daha fazla hareketlilik gösterdikleri görülmüştür. Bilhassa önemli olan bulgu ise, kayıtdışı-ücretsiz halden kayıtlı-ücretli hale geçiş olasılığının ters olasılığına oranla yaklaşık 5 kat daha fazla olmasıdır. Bu bulgu, kayıtdışılıktan kayıtlı hale geçişlerin tek yönlü olduğunu varsayan geleneksel teoriyi doğrulamaktadır.
- Kayıtdışı-kendi hesabına çalışanlara bakıldığında, işgücü geçişkenliği olasılıklarının oldukça düşük olduğu gözlemlenmiştir. Ancak, tarım çalışanları örneklemden çıkarılarak tarımdışı istihdam sonuçları incelendiğinde, bu resmin tamamen değiştiği görülmüştür. Bu durumda, işgücüne dahil olmama dışındaki tüm işgücü piyasası durumlarında geçiş olasılığı yaklaşık iki katına çıkmaktadır. Söz konusu bulgu, Turkiye'deki kayıtdışı-kendi hesabına çalışmanın niteliğinin Brezilya, Meksika ve Arjantin gibi ülkelerdekine nazaran farklı olduğunu ortaya koyması bakımdan önemlidir. Turkiye'deki kayıtdışı-kendi hesabına çalışma hali genellikle istem dışı olarak gerçekleşen ve kendi-hesabına çalışmanın alt-katmanı şeklinde özellikler gösteren bir yapıya sahiptir, oysa diğer birçok ülkede kayıtdışı-kendi hesabına çalışma çoğunlukla gönüllü olarak tercih edilen üst-katman bir kendi-hesabına çalışma tipidir.
- İşgücü piyasasındaki en yoğun ve heterojen yapılı hareketliliği işsizler grubu göstermektedir. Bu grupla ilgili en kayda değer bulgu, kayıtdışı istihdam tiplerinden birine geçiş olasılığının kayıtlı istihdam tiplerinden herhangi birine geçiş olasılığının iki katı olduğudur. Bu sonuç da yine kayıtlı iş olanaklarının kayıtdışındakilere oranla daha sınırlı ve daha yüksek giriş bariyerlerine sahip olduğunu desteklemektedir.
- İşgücüne dahil olmayanlar grubuna bakıldığında, bu durumdan çıkışların ihmal edilebilir derecelerde düşük olduğu görülmüştür. Bu durum işgücüne dahil olmayan; ancak çalışma çağında olan bireylerin işgücüne dahil olma olasılıklarının son derece sınırlı olduğunu göstermiştir. Bu durumun Türk işgücü piyasasındaki bir başka katılığa işaret ettiğini söylemek mümkündür. Bu durum temelde ümidi kaybeden işçi etkisine ve

kadınların büyük çoğunlukla işgücüne dahil olmamalarına bağlı olarak açıklanabilir.

Yukarıda kısaca değinilen sonuçlar 2006-2007 geçişlerine aittir. 2006-2008 geçişlerine bakıldığında, en dikkat çekici olan farklılıklar şu şekildedir. Birincisi, kayıtdışı-ücretli durumundan kayıtlı-ücretli durumuna geçiş olasılığı 2006-2008 döneminde 2006-2007 dönemine kıyasla yaklaşık 2 kat artmıştır. İkincisi, söz konusu dönemler arasında, kayıtlı-kendi hesabına durumundan kayıtlı-ücretli durumuna geçiş olasılığı yaklaşık 2,5 kat artmıştır. Üçüncüsü, işsizlikten kayıtlı-ücretli durumuna geçiş olasılığı ise üçte bir oranında artmıştır. Genel olarak bakıldığında, işgücü piyasasındaki hareketliliğinin ve kayıtlı-ücretli hale geçişlerin arttığı söylenebilir. Dört yıllık geçişlerde ise genel çerçeve benzer olmakla birlikte, en temel fark çalışmama hallerine (işsizlik ve işgücüne dahil olmama) geçiş olasılıklarının önemli ölçüde bir yükselme kaydetmesi olarak görülmüştür. Bu bulgu küresel iktisadi krizin Türk işgücü piyasasındaki olumsuz etkileri şeklinde yorumlanabilir.

İşgücü durumları arasındaki geçişlerin altında yatan ve bir durumdan öbürüne geçiş olasılıklarını etkileyen faktörlerin belirlenmesi kayıtdışılığı azaltmaya yönelik politikaların tasarımı için son derece önemlidir. Bu faktörleri tespit edebilmek için Katlı Terimli Logit (Multinomial Logit, MNL) yöntemine başvurulmuştur. Nitekim MNL analizi işgücü piyasasındaki geçişlerin olasılıklarını çeşitli faktörlerin bir fonksiyonu olarak modellemeyi mümkün kılmaktadır. Burada özellikle vurgulanması gereken nokta, MNL analizinin ortaya koyduğu katsayı tahminlerinin çıkarsamalarda sadece nadiren kullanıldığı, daha ziyade açıklayıcı değişkenlerin marjinal etkilerinin yorumlanmasına önem verildiğidir. Bu çalışmada, literatürdeki genel eğilimler paralelinde, her bir işgücü piyasası durumu (kayıtlı-ücretli, kayıtdışı-ücretli, kayıtlı-kendi hesabına, kayıtdışı-kendi hesabına, işsiz ve işgücüne dahil olmayan) için 6 adet katlı terimli logit regresyonu tahmin edilmiştir. Bu çerçevede, her bir regresyondaki bağımlı değişken farklı bir içerik ve anlam taşımaktadır. Bağımsız değişken gözlem birimi olan birey 2007 yılında da 2006 yılındaki işgücü piyasasını koruyorsa 0 değerini;

diğer 5 işgücü piyasası durumlarından birine geçti ise, her bir ihtimale karşılık gelecek şekilde 1 ile 5 arasındaki değerleri almaktadır.[5] Örneğin, 2006 yılında kayıtlı-ücretli olan bireyler; 2007 yılında halen kayıtlı-ücretli durumdaysa 0; kayıtdışı-ücretli olduysa 1; kayıtlı-kendi hesabına olduysa 2; kayıtdışı kendi-hesabına olduysa 3; işsiz olduysa 4 ve işgücü dışına çıktıysa 5 değerini alacaktır. Açıklayıcı değişkenler yaş, cinsiyet, eğitim durumu, medeni hal, meslek, iktisadi sektör, iş yeri büyüklüğü, iş deneyimi ve iş deneyiminin karesinden oluşmaktadır.

Yukarıda anlatıldığı biçimde yapılan analizler neticesinde işgücü piyasası durumları arasındaki geçişleri üzerinde etkili olan faktörler belirlenmiştir. Bu çerçevede öne çıkan sonuçlar aşağıdaki gibidir.

- Cinsiyet faktörünün işgücü hareketliliğini belirleyen unsurların başında yer aldığını görülmektedir. Buna göre, kadınlar işgücü piyasasında erkeklere oranla daha dezavantajlı bir pozisyonda görülmektedir. Çoğunlukla kayıtdışı-kendi hesabına veya işgücüne dahil olmama durumlarında olan kadınların işgücü piyasası durumlarını değiştirme olasılıkları oldukça düşüktür. Bu bulgu kadınların geleneksel ve kültürel olarak aile içindeki rolleri ve doğurganlık özelliklerini; işgücü piyasasında işe alma ve işten çıkarma gibi durumlarda kadınlara karşı uygulanan negatif ayrımcılığı; kadınların eğitim ve beceri seviyelerinin erkeklerinkine kıyasla daha düşük olduğunu göstermesi şeklinde yorumlanabilir.
- İşgücü piyasasındaki hareketliliği açıklayan önde gelen diğer bir faktör eğitimdir. Ana akım anlayışı doğrulayacak şekilde, lise veya üniversite diplomasına sahip bireylerin yalnızca ilkokul diplomasına sahip olanlara göre oldukça düşük olasılıkla kayıtdışına geçme olasılığı taşıdıkları görülmüştür. Nitekim, yüksek eğitime sahip kişiler için iş kaybı riski ve yeni iş imkânları için karşılaşılan engeller görece daha düşüktür. Bu sebeplerle eğitim seviyesi yüksek olan bireylerin kayıtlı istihdam

[5] MNL analizi 2006-2007, 2006-2008 ve 2006-2009 geçişleri için teker teker yapılmıştır. Aynı tanımlar, 2007 yılının 2006-2008 geçişlerinde 2008 ve 2006-2009 geçişlerinde 2009 ile değiştirilmesi ile geçerliliğini koruyacaktır.

durumuna geçme olasılıkları daha düşük eğitimli bireylere nazaran yüksektir.

- Yaş unsuru ile ilgili MNL regresyon sonuçları, yaş seviyesi düştükçe kayıtlı işgücü durumuna geçme olasılığının azaldığını göstermektedir. İleri yaş gruplarındaki bireylerin işgücü dışına çıkış olasılıklarının daha yüksek, girişlerinin ise daha düşük olduğunu söylemek mümkündür. Bu Türkiye'de önemli bir sorun olan erken emeklilik sisteminin bir sonucu olarak yorumlanabilir.
- Hanehalkı karakteristiklerine bakıldığında, MNL analizi sonuçları iki kayda değer bulguya işaret etmektedir. Bunlardan ilki, hanehalkindaki fert sayısı arttığında kayıtdışı-ücretli durumda kalma olasılığının artmasıdır. Bu sonuç artan fert sayısıyla beraber gelen geçim yükünün ve hanehalkı ihtiyaçlarının artmasının, fertleri kayıtdışı da olsa işlerine tutunmaya itmekte olduğu şeklinde yorumlanabilir. Buna ek olarak, hanehalkındaki fert sayısına paralel olarak işsiz duruma ve kayıtlı ya da kayıtdışı kendi hesabına duruma geçiş olasılıklarının düşme eğiliminde olduğu görülmektedir.
- Faaliyet gösterilen iktisadi sektör de yine işgücü hareketliliklerini belirleyen önemli bir unsur olarak karşımıza çıkmaktadır. Bununla ilgili olarak en dikkat çekici bulgular, sanayi işçilerinin kayıtlı-ücretli kalma olasılıklarının daha yüksek, tarım işçilerinin kayıtdışı-kendi hesabından çıkma olasılıklarının daha düşük ve inşaat işçilerinin kayıtdışı-ücretli duruma geçiş olasılıklarının daha yüksek olduğunu ortaya koymaktadır.

Bu bölümdeki bulguları genel bir çerçeve altında toplarsak, Türk işgücü piyasasında, işgücü durumları arasındaki geçişkenliğin sınırlı olduğu durağan bir yapı olduğu söylenebilir. Öte yandan, geçişkenlik olasılıkları kayıtdışından kayıtlıya olan geçişlerde tersi yönde geçişlere kıyasla daha yüksek olmaktadır. Bu sonuç, kayıtlı istihdam halinin çoğunlukla fertler için nihai hedef durum olduğunu, kayıtdışı çalışma halinin ise bu geçişi gerçekleştiremeyen fertler için geçici veya mecburi bir alternatif olarak kullanıldığını işaret etmektedir. İşgücü piyasasındaki geçişlerin nitelik ve boyutları cinsiyet, eğitim, yaş, hanehalkı tipi ve

iktisadi sektörün başı çektiği birtakım değişkenler ve çalışma tiplerine özgü özellikler ile büyük ölçüde açıklanabilmektedir.

Çalışmanın son bölümünde Türkiye'de kayıtlı veya kayıtdışı olarak çalışanların ücretleri incelenmektedir. Ana akım literatürde, kayıtdışı istihdam çoğunlukla düşük kazanç ile ilişkilendirilmektedir. Konvansiyonel segmentasyon teorisi bu stilize olguyu, kayıtdışı istihdamın işgücü piyasasında genelde dezavantajlı olan veya kayıtlı iş imkanlarına ulaşamayan bireylerin hayatlarını sürdürmek için başvurduğu alternatif olması ile açıklamaktadır. Kayıtlı sektördeki ücretler kurumsal veya etkin ücret (efficiency wage) kaynaklı olarak denge fiyatının üstünde belirlenmekte, kayıtdışı çalışanlar ise kayıtlı sektördeki benzerlerine kıyasla daha düşük maddi karşılık almaktadırlar. Öte yandan, rekabetçi piyasa yaklaşımına ise, işçi ve işverenlerin maliyet muhasebeleri çerçevesinde istemli olarak kayıtdışılığı tercih edebileceklerini; böyle bir piyasada kayıtlı/kayıtdışı ücret farklılıklarının zaman içerisinde ortadan kalkacağını öngörmektedir.

Bu bölümde, yukarıda bahsedilen teorilerin Türkiye işgücü piyasalarına uygunluğu kayıtlı/kayıtdışı ücret farklılıkları kullanılarak analiz edilmektedir. Ücret farklılıklarının kapsamlı bir tanısı, altyapısının dinamikleri ve birtakım kişisel ve iş karakteristik özelliklerine göre ayrıştırılmaları, Türkiye gibi bir gelişmekte olan ülkede büyük önem arz etmektedir. Zira, kayıtdışı istihdam kentsel ve kırsal istihdamın ciddi bir kısmını teşkil etmekte; ücret farklılıklarının boyutları segmente (segmented) ya da rekabetçi (competitive) bir piyasanın varlığını ortaya koymakta; ve kayıtdışı istihdamın ücretli/kendi hesabına ve gelir dağılımının farklı noktalarında ayrıştırılması politika tasarımına önemli bir girdi olmaktadır. Bu amaçla beş adet sorunun cevabı araştırılmaktadır. Türkiye'de kayıtlı/kayıtdışı istihdam arasında ücret farklılıkları var mıdır? Bu farklılık kayıtdışındakilerin aleyhine midir? istihdam ücretli/kendi hesabına olarak ayrıştırıldığında gelir farklılıkları nasıl bir tablo çizmektedir? Kayıtlı/kayıtdışı sektör ücret farklarını belirleyen gözlemlenebilir (observable) ve gözlemlenemeyen (unobservable) faktörler nelerdir?

Bu doğrultuda, ücret farklılıkları hem kayıtlı/kayıtdışı, hem ücretli/kendi hesabına hem de gelir dağılımının ortalama/kantil bağlamlarında analiz edilmektedir. İlk olarak, Mincer gelir denklemi gözlemlenebilir birtakım faktörler kontrol edilerek ve en küçük kareler (Ordinary Least Squares, OLS) yöntemi kullanılarak tahmin edilmektedir. Daha sonra ise, kayıtlı ve kayıtdışı sektörlerin yapılarındaki heterojeniteyi dikkate alan kantil regresyon analizi (Quantile Regression, QR) ve ücret farklılıklarını belirleyen zamanla değişmeyen gözlemlenemeyen faktörlerin kontrol edilmesini mümkün kılan sabit etki (Fixed Effects, FE) regresyonu analizi gerçekleştirilmektedir.

Kademeli olarak tahmin edilen OLS sonuçları kayıtdışı işçilerin aleyhine bir ücret farklılığı olduğunu tespit etmekle beraber, bu farklılığın yaklaşık %50'sinin gözlemlenebilir faktörler tarafından açıklanabildiğini göstermiştir. Ardından aynı analiz kadın ve erkek alt örneklemleri için tekrarlanmıştır. Kayıtdışı istihdam aleyhine olan ücret eşitsizlikleri, sadece ferdin kişisel özellikleri kontrol edildiğinde, kadın çalışanların erkeklerden iki kat daha fazla görülmekte; ferdin iş özellikleri faktörleri de regresyona dahil edildiğinde kadın ve erkek çalışanlarda hemen hemen aynı olarak gözlemlenmiştir. OLS tahmin sonuçları, ücretli/kendi hesabına ayrımında bakıldığında, kayıtlı-ücretli çalışanların kayıtdışı-ücretlilere kıyasla oldukça yüksek bir ücret aldığını göstermiştir. Buna ek olarak, kayıtdışı sektörün yapısındaki heterojeniteyi destekleyecek yönde, kendi-hesabına çalışanların ücretli olarak çalışanlardan daha düşük gelir elde ettikleri görülmüştür. Ortalamada tahminlerin çok açıklayıcı olmadığı ve sektörlerin doğaları gereği sahip oldukları heterojen yapıyı gözlemleyemediği gerekçesiyle, kantil regresyon analizleri kullanılarak ücret eşitsizliğinin gelir dağılımının farklı noktalarındaki nitelik ve boyutlarının incelenmesine olanak sağlanmıştır. Bu çerçevede gerçekleştirilen analizler, ücret farklarının gelir dağılımı boyunca aynı olmadığını göstermiştir. Gelir seviyesi arttıkça kayıtdışı istihdam aleyhine olan eşitsizlik azalmaktadır. Düşük kantillerde anlamlı çıkan bu fark, tepedeki kantillere gelindiğinde anlamlılığını kaybetmekte, hatta kayıtdışılık lehine dönmektedir. Bu sonuçlar, kayıtdışı sektörün temelde iki katmanlı olan heterojen yapısını ortaya çıkarmaktadır; kayıtdışılığın alt-katmanında yer alan çalışanlar

ücret bakımından ciddi olarak cezalandırılmaktayken, üst-katmandakiler kayıtlı çalışmanın yararlarını telafi edebilecek denli yüksek kayıtdışılık primi elde etmektedir. Bu analizin ortaya çıkardığı bir diğer önemli bulgu da, ana akım literatürde kayıtdışılığın alt-katmanı ücretli istihdam ve üst-katmanı kendi-hesabına çalışma ile ilişkilendirilirken, Türkiye örnekleminde tam tersi bir sonuç gözlemlendiğidir. Bir diğer ifadeyle, Türkiye'de alt-katman daha ziyade kendi hesabına çalışan işgücüne, üst-katman ücretli olarak çalışan işgücüne karşılık gelmektedir. QR analizi kadın ve erkek alt örneklemler için ayrı ayrı tekrarlandığında, kadınlarda ücret farklılıklarının gelir dağılımı boyunca çok daha büyük farklılıklar gösterdiğini ortaya koymuştur. En düşük kantilde yüzde 48 olan kayıtlı-ücretlinin kayıtdışı-ücretliye göre ücret fazlası; en yüksek kantilde yüzde 42lik bir ücret eksiğine dönüşmüştür.

En son olarak ise, ücret farklılıklarını belirleyen zamanla değişmeyen gözlemlenemeyen faktörlerin (time-invariant unobserved factors) kontrol edilmesini mümkün kılan sabit etki (FE) regresyonu analizi gerçekleştirilmektedir. Sonuçlar oldukça çarpıcıdır: Gözlemlenemeyen bireysel sabit etkiler, gözlemlenebilir bireysel ve iş ile ilgili faktörlerle birleştirildiğinde kayıtlı-ücretli ile kayıtdışı-ücretli arasındaki ücret farklılıklarının tamamını açıklamaktadır. Bu bulgu Türk işgücü piyasasındaki kayıtlı-kayıtdışı segmentasyonunun stilize gerçek olmadığını veya olmayabileceğini işaret etmektedir. Zira bireylere özgü zamanla değişmeyen (etnik köken, içine doğulan ailenin yapısı ve şartları, zeka ve algı becerileri gibi genetik faktörler) özelliklerin; kayıtlı ve kayıtdışı çalışma arasındaki, yaş, cinsiyet, eğitim vb. gözlemlenebilir faktörlerle açıklanamayan ücret farklılığını tamamen açıkladığı görülmüştür. Sabit etki analizi ile kadın ve erkek alt örneklemler için yapıldığında da bu sonucu destekler bir şekilde, kadınlarda hiçbir anlamlı ücret eşitsizliği olmadığı, erkeklerde ise yalnızca çok az anlamlı bir kayıtdışılık cezası olduğu sonucuna varılmıştır. Sabit etki modeli ücretli/kendi hesabına çalışan ayrımını da içermesi yönünde değiştirildiğinde, üç temel bulguya işaret etmektedir. Bunlardan ilk olarak, kayıtlı ve kayıtdışı çalışan ücretli işçilerin arasında istatistiksel olarak anlamlı bir ücret farklılığı bulgusuna rastlanmamasıdır. İkinci olarak, kayıtlı

kendi-hesabına çalışanlar kayıtdışı-ücretli çalışanlara göre toplam örneklemde yüzde 15, erkek alt örnekleminde yüzde 21 daha fazla kazanmaktadır. Üçüncü olarak ise, kayıtdışı-ücretli çalışanların kayıtdışı-kendi hesabına çalışanlardan daha fazla kazandıkları yönündeki önceki bulgu, zamanla değişmeyen gözlemlenemeyen faktörler hesaba katıldığında ortadan kalkmaktadır. Öte yandan, yalnızca kadın çalışanlar için gözlemlenen yüzde 40'lik kayıtdışı-kendi hesabına aleyhine olan gelir farklılığı, kendi hesabına çalışmanın kayıtdışı istihdamın alt-katmanını oluşturduğunu doğrulamaktadır.

APPENDIX C

CURRICULUM VITAE

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PUBLICATIONS

Omay, T. and E. Ö. Kan (2010). "Re-examining the Threshold Effects in the Inflation-Growth Nexus: OECD Evidence", *Economic Modelling,* 27 (5), p. 891-1336

AWARDS and HONORS:

University of Southern California Merit Award Scholarship, Aug. 2006, Los Angeles
McKinsey & Company EuroAcademy Representative for Turkey, 2005,Athens
Turkish National Science Foundation Scholarship For Graduate Studies, 2005
High Honor Student, Bilkent University, 2000-2004
Sinan Karacadag Scholarship, Bilkent University, 2002-2003
Academic Success Scholarship, Bilkent University, 2001-2002

APPENDIX D

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TEZ FOTOKOPİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü	
Sosyal Bilimler Enstitüsü	X
Uygulamalı Matematik Enstitüsü	
Enformatik Enstitüsü	
Deniz Bilimleri Enstitüsü	

YAZARIN

Soyadı : KAN
Adı : ELİF ÖZNUR
Bölümü : İKTİSAT

TEZİN ADI : ESSAYS ON INFORMALITY IN THE TURKISH LABOR MARKET

TEZİN TÜRÜ : Yüksek Lisans [ ] Doktora [X]

1. Tezimin tamamı dünya çapında erişime açılsın ve kaynak gösterilmek şartıyla tezimin bir kısmı veya tamamının fotokopisi alınsın. [ ]

`

2. Tezimin tamamı yalnızca Orta Doğu Teknik Üniversitesi kullancılarının erişimine açılsın. (Bu seçenekle tezinizin fotokopisi ya da elektronik kopyası Kütüphane aracılığı ile ODTÜ dışına dağıtılmayacaktır.) [X]
3. Tezim bir (1) yıl süreyle erişime kapalı olsun. (Bu seçenekle tezinizin fotokopisi ya da elektronik kopyası Kütüphane aracılığı ile ODTÜ dışına dağıtılmayacaktır.) [X]

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