

The labour market attachment of an aged population: An empirical analysis from Turkey

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Abstract

The labour market attachment of older individuals is probably different from that of their younger counterparts since their career horizons are closer. In general, older individuals are not as willing to invest in their human capital. In this regard, one of the objectives of this paper is to investigate the impacts of human capital on the labour market attachments of older individuals. In addition, due to the constraints of commuting long distances, migrating in search of employment, learning new technological innovations or carrying out job search activities, older individuals are more likely to be limited to local opportunities. The other objective is to examine whether local labour market opportunities have an effect on the labour market attachment of older individuals. In other words, not only supply side of the labour market but also demand side of labour market is concerned in this paper. Household Labour Force Surveys (2007, 2008) and a General Census of Industry and Business Establishments (2007, 2008) conducted by TurkStat are used in this research. We found that having a university education increases the labour market attachment of older individuals. Also, having a higher prevalence of jobs in the estate sector decreases the labour market attachment of older individuals. To sum, one can say that, labour market attachment of older individuals in Turkey is more likely to be related to supply side of the labour market not demand side of the labour market.

Key Words: Older, Local labour market, Labour Market Attachment, Technical progress.

JEL Classification: J00, J14, J29, O33.

1. Introduction

A rapid structural transformation occurs in world economies during their development process. In particular, the demographic structures of developing countries change over time. In recent years, mortality and

fertility rates have been decreasing while living standards have been increasing and this has resulted in an ageing population in most developing countries, including Turkey. This demographic trend leads to an ageing labour force and decreases the population capable of working. With these changing conditions, providing the opportunity for older individuals to participate in the labour market becomes an important issue. Therefore many studies in the literature have started to focus on the role of older individuals in the labour market. This fact also motivated us to focus on the labour market attachment of individuals who are 55 and older¹.

One of the objectives of this paper is to analyse the impacts of the human capital endowment on the labour market attachment of older individuals. During this examination, the existence of a difference between the labour market attachment of older individuals and their younger counterparts, since the older individuals' career horizon is closer, is taken into consideration. In general, older individuals are not willing to invest in their human capital endowment.

Note that, these concerns are coming from the supply side of the labour market. Considering the demand side of the labour market, wage variable and regional dummies could be used. However, for these variables to be appropriate proxies for labour demand, the arrival rate of job must be uniform across workers with similar productive characteristics. This assumption can be valid for younger workers whose mobility is sufficient to clear the labour market. On the other hand, for older workers this is unlikely to hold since they are more mobility constrained. Therefore, we hypothesize that the arrival rate of job offers for older workers or potential workers depends on the prevalence of older worker-appropriate jobs in the local area. In other words, controlling for individuals characteristics, an older individual to be marginally attached (decision to participate), will depend on the arrival rate of suitable offers and thus, on the composition of employment in the local labour market.

In addition, because of the constraints on their ability to commute long distances, migrate in search of employment or learn new technological innovations, older individuals' job search activities are more likely to be limited to the opportunities available locally. In this situation, the opportunities of the local labour market play a crucial role in the employment of older workers. Therefore, in this study we also examine the effects of local labour market opportunities on the behaviour of older individuals in the labour market. In addition, whether these local labour market opportunities affect the labour market attachment of older individuals and younger individuals will also be examined. Since the reservation wages and their constraints are probably different between older and younger individuals, the effect of any opportunities will also differ.

¹ Individuals who have labour market attachment are the ones who are employed, unemployed and those who are willing to start work within 15 days-marginally attached to labour market.

We use several data sets in our analysis. The main data set is from the Household Labour Force Survey for the years 2007 and 2008. One of the supplementary data sets is the General Census of Industry and Business Establishments, conducted by TurkStat. It was used to assess Turkey's provincial and NUTS2 level industrial structure, for the years 2007 and 2008. The other supplementary data set is ABPRS (Address Based Population Registration System), which is an administrative database covering the entire population of Turkey for the same years. The working age population of each province is provided from the ABPRS database. The provincial employment to working age population ratios are used as a proxy for the industrial composition of the local labour market.

Logistic regression analysis is applied to examine the link between local labour market opportunities and the labour market attachment of older individuals who were retired the previous year. As previously stated, we use the employment to population ratios according to NUTS2 levels as explanatory variables. Thus, we include a cluster correction in order to take into account about the fact that these variables are not independent across observations in the same NUTS. In addition, we run the same regressions for young individuals (20-34 year-olds). Actually, the young individuals are considered as a control group which allows the examination of the impact of the local labour market structure on the labour market attachment of younger individuals. By applying the same exercise to younger individuals, it is possible to see the variations of the impact of local labour market structure between younger and older individuals.

The paper is organized as follows. Section 2 is dedicated to the theoretical framework and literature review while Section 3 gives a brief summary regarding the situation of older individuals in the Turkish labour market. Section 4 presents the data and descriptive statistics. The methodology is described in Section 5, and Section 6 includes the discussions of the empirical findings. Section 7 is reserved for the conclusion.

2. Theoretical framework and literature review

2.1. *Theoretical framework*

The typical framework that economists use to analyse labour supply behaviour is called the *neoclassical model of labour-leisure choice*. The aim of this model is to examine the factors that determine whether a particular person works or not and if so, how many hours she/he chooses to work. The basic belief is that an individual gets satisfaction from consuming goods and leisure is summarized by the utility function. The individual's consumption of goods and leisure are constrained by time and income level. A person's budget constraint has two components: the sum of labour earnings and non-labour income. In this paper, for the case of an aged individual, we assume

that the retirement pension can be regarded as one of the resources of non-labour income. The retirement pension (non-labour income) increase leads to the willingness to work to decrease. In other words, an increase in non-labour income raises the demand for leisure hours. Thus, the attachment to the labour market is probably lower for retired individuals than it is for their younger counterparts.

Human capital endowment indicators are level of education, experience, job tenure, seniority, on the job-learning etc. In Human Capital Theory, wages are a function of the stock of human capital and the given rate of return for that human capital. Therefore, the individuals with higher human capital endowment (education) have higher reservation wages². Furthermore, the standard model of conducting a job search implies that the reservation wage is a function of the wage offer distribution, the arrival rate of job offers, and search costs. There is not only one wage offer distribution: individuals with higher human capital have a wage offer distribution that dominates those with a lower human capital endowment. More highly educated individuals lead to higher reservation wages. In reality, more highly educated individuals may have troubles in finding acceptable jobs since the higher reservation wage, the lower the chance that an individual will accept a job offer. From this perspective, higher education may cause to a decrease in labour market attachment. However, one should not forget the fact that the higher the education level means the more easily an individual can adopt to new technologies. Therefore, an individual with a higher education level will have a higher job arrival rate which leads to higher labour market attachment. To sum up, there are two opposite impacts of human capital endowment depending on which effect dominates; the labour market attachment of both individuals will differ.

2.2. Literature review

Modern civilization has brought higher standards of living and longer life expectancy for the citizens of the world. By early next century, the numbers and proportions of the older people are expected to rise substantially in developed, transition and also in most developing countries. In this respect, the link between ageing populations and labour market structures has gained importance in the literature during the last decades. Researchers pay much more attention to the ageing of the population and its labour market implications.

The reduced fertility rate causes unfulfilled employment needs in the labour market because the number of new entrants becomes insufficient to replace the retiring ones in developing and transition countries (Winkelmann-Gleed, 2009). Developed countries already have large older populations, and are faced with low or sub-replacement fertility rates as well

² Reservation wage is the lowest wage rate at which a worker would be willing to accept a particular type of job.

(UNFPA, 1998). Therefore, the dependency ratio will continue to rise as the number of economically inactive people increases relative to those who are economically active.

In the meantime, as a developing country Turkey will also face this problem. Although Turkey's working-age population will continue to grow until around 2020, the demographic window starts to close. Actually, Turkey will have the population profile of an ageing society compared to previous periods³. The trend of world economies induces the topic of understanding older individuals' situation in the labour market crucial. Especially after retirement, the decision of older workers to either continue to work, stay out of the workforce or re-enter the labour market starts to play an important role for the new labour market conditions. As a result of an ageing population, there exists an insufficiency to fulfil labour market needs. In this respect a major labour shortage is expected which would cause serious problems for macroeconomic performance (Villoso et al, 2008). Therefore, if countries have a desire to increase the labour market attachment of older individuals, they have to understand their attitudes, experience and aspirations.

Besides the possibility of a future labour supply shortage, there is one other reason for targeting the labour market attachment of older individuals, namely the happiness of the older individuals. Some research in the literature revealed that older individuals who are out of the labour force are less happy than the ones attached to the labour market (Winkelmann and Winkelmann, 1998). It has also been concluded that older workers would have presumably preferred a gradual transition from long hours to shorter and shorter hours than to move immediately to full retirement. Another survey shows that 59% of older workers would like to work beyond the statutory pension age (OECD, 2005). However, the labour force participation of older individuals depends on their quality of health and their partner's working status, both of which are related with personal matters⁴ (Humphrey et al., 2003).

On the demand side of the labour market attachment of older individuals; it is stated that the retirement decision is partly based on utility (profit) maximization by employers⁵ (Hallberg, 2008). Therefore, older workers are more likely to experience redundancy and hence involuntary early retirement in many countries such as the US, UK, France, Germany and Scandinavia (Meadows, 2003). Redundancy cost and hiring cutbacks

³ For further information about the Turkish labour market structure please see page: 7-14.

⁴ In their work, Humphrey et al (2003) stressed that the proposition in work declined with higher age, men were more likely to be in a work than women. Better qualifications alter the work decision and having a health problem reduces the likelihood of working. If their partners are working they were far more likely to also be working

⁵ He stressed that many studies in the literature only focus on one side of the retirement decision, which is the individual decision. According to Hallberg, these studies focus on the effects of changes in pensions and earnings on the decision to retire (For further information: see Hallberg (2008), Gruber and Wise (2004), Hurd (1990)).

also have effects on the labour demand for older workers (Hurd, 1996; Acemoglu and Angrist, 2001; Hakola and Uusitalo, 2005).

Heywood and Silbert (2009) pointed out that older workers have less desire or ability to adapt to new methods of work or technological progress. Aubert et al. (2006) claimed that older workers are far less likely to work in those positions or for firms that use the latest technological innovations. For instance for the US, it has been found that technical progress induces the early retirement of older workers. The early retirement rate has a positive correlation to the sector's rate of technical progress (Ahituv and Zeira, 2004)⁶. In addition, it is stressed that with technological progress, the needs of specific training are less profitable for older workers as they have closer career horizons than younger ones (Heywood and Siebert, 2009). In this respect, firms with economic activities which are more likely to require more technological inputs, such as manufacturing, are less likely to hire older workers.

Recently, several studies have focussed on the decision of older workers to re-enter the labour market. It has been emphasized that there exists two main reasons for labour market re-entry of older individuals. One is financial necessity caused by a change in circumstances and the other is to fulfil financial, physical and psychological needs (Irving et al, 2005). The re-entry decision depends on their health; willingness to work and their having recent work experience. From a different point of view, labour market re-entry mostly depends on their education level, their being professionally trained and their having a strong work history.

Irving et al. (2005) also summarized the characteristic of older workers who re-entered the labour market. They stressed that there were various type of older workers who prefer to re-enter the labour market. While older workers with lower incomes re-enter due to financial necessity, ones with high incomes re-enter to labour market to maintain their lifestyles or to afford luxuries. They found statistically significant no difference between men and women's decision regarding re-entry. McNair et al. (2006) focused on education, health and wealth during determining employability and motivation to work of older workers. They found that those with poor health are more likely to leave the labour market when they are in their fifties.

Employment protection legislation also has an effect on the labour market re-entry of older individuals. For instance, raising the dismissal costs of workers is likely to make firms averse to the risk of hiring older workers (Daniel and Siebert 2005). Therefore, age discrimination laws which

⁶ In this paper, the authors focus on the erosion effect of technical progress on labour force participation of workers, especially older ones. They conclude that as older workers have closer career horizons, technical progress reduces their employment rate due to the cost of learning new technologies. They also claimed that this effect is stronger for older workers. For further information see Ahituv and Zeira (2004).

specifically protect the job rights of older workers could make firms even less likely to hire them (Lahey, 2006).

It should also be kept in mind that the literature on labour force participation has generally emphasized not supply-side factors, including life-cycle, human capital and household composition variables but also demand-side factors. In the presence of life-cycle factors and human capital depreciation for older individuals, labour market re-entry is also determined by the opportunity structure in the local labour market. Due to the constraints on their ability to commute long distances or to migrate in search of employment and the difficulties of learning new technological innovations, older individual's job search activities are likely to be limited to local opportunities.

As for our particular concern, there is a lack of research about the behaviours of older individuals in the Turkish labour market. This motivates us to analyse the labour market attachment of people aged 55 and over in Turkey. Therefore, the main aim of this paper is to fill this gap.

3. Turkish labour market: Older individuals

Before the 2000s, Turkey experienced economic and political instability. During the 2000s, a structural reform package was undertaken as a continuation of previous ones undertaken in the 1980s, and Turkey has since experienced a substantial economic growth performance (Tunalı, 2003).

The structure of the Turkish population has changed over time. Decreasing mortality and fertility rates and higher living standards have resulted in an ageing population. This fact increases the importance of targeting older workers who are 55 and above in the labour market. In this section, after analysing the population structure of Turkey, a brief summary of the Turkish labour market is discussed using published data from the Turkish Statistical Institute.

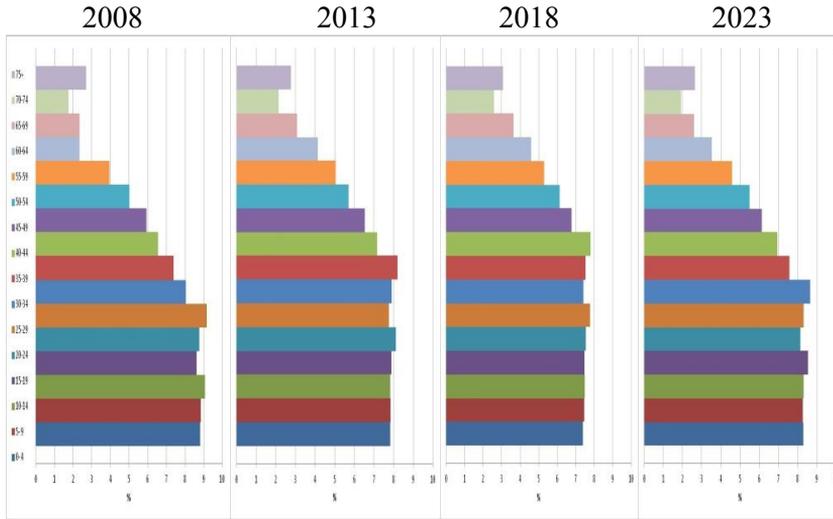
3.1. Population

As is common for all developing countries, Turkey is starting to face an ageing population. Actually, the main impact of the ageing problem is expected to be seen in the second half of the twenty-first century. Figure 1 shows the population pyramid given for 2008, 2013, 2018 and 2023⁷. Vertical axis shows the age groups while horizontal axis shows the proportion of each age group in the population. The population pyramid of 2008 indicates that there is a high proportion of young individuals and a low proportion of older individuals. However, the proportion of older individuals becomes higher over time. This could be evidence for the ageing problem

⁷ A population pyramid is a graphical illustration that shows the distribution of various age groups.

within the population of Turkey. This demographic trend gives rise to an ageing labour force and a decreasing of the population who are capable of working. This trend endangers the future of social systems (DPT, 2007). Thus, it is important to provide opportunities for the labour attachment of older individuals.

Figure 1
Mid-year population projections by age groups

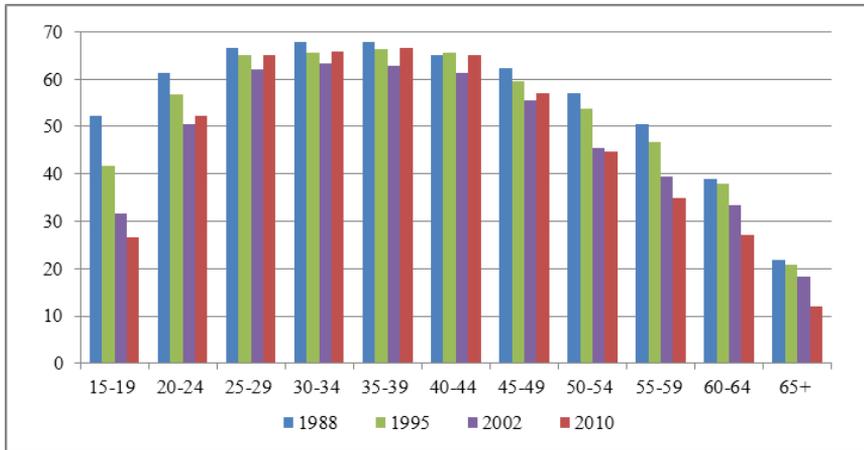


Source: Population Projections, TURKSTAT.

3.2. Labour force participation rate by age groups

Figure 2 displays the labour force participation rate by age group for the years 1988, 1995, 2002 and 2010. Figure 2 represents the changing trend of the labour force participation of the age group over time. It is seen that the labour force participation of older individuals (over 55 years old) has a decreasing trend over time. While the participation rate is shown to be nearly 50% in 1988 for the age group of 55-59, it decreased to nearly 35% in 2010. The other older age groups also show the same trend.

Figure 2
Labour Force Participation by Age Groups



Source: HLFS database, TURKSTAT (1988-1995-2002-2010).

One other finding, which can be seen in Figure 2, is the fact that the labour force participation rate increases by age-group until 35-39 and older, at which point it starts to decline for all of the years under investigation. For instance, in 2010, the labour force participation of individuals aged 50-54 is 43% while it is 35% for individuals aged 55-59. These participation rates are lower than the European Union average (which is 45%)⁸. When the variations between the years are investigated, it can be seen that the labour force participation of older individuals for 2010 is the lowest, while the second lowest participation rate occurred in 2002. The highest participation rate is shown to have occurred in 1988. This decrease in labour force participation of older individuals could be related to the decreasing share of the agricultural sector in the total employment. In order to confirm this phenomenon, employment shares by age groups are examined.

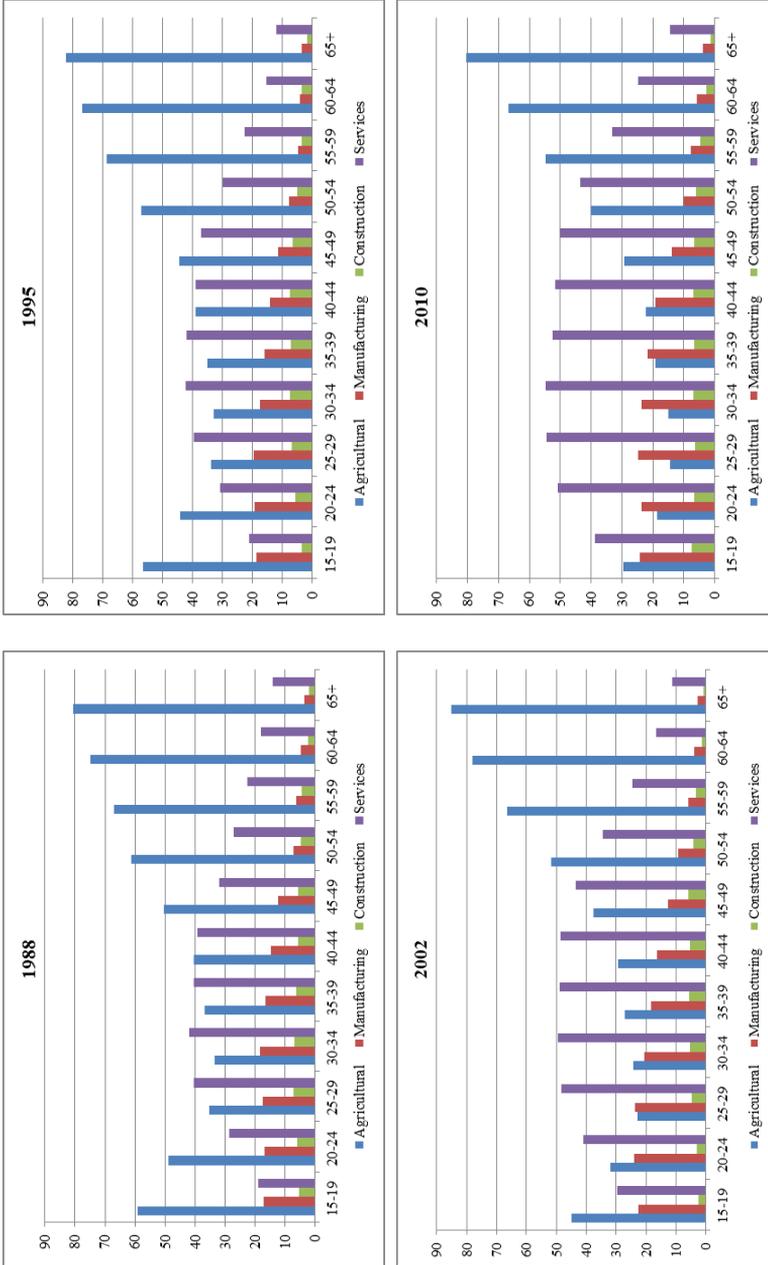
3.3. Employment shares of age groups between sectors

Employment share by age group are given in Figure 3. As clearly seen from the Figure 3, the older individuals seem to stick to the agricultural sector throughout the investigated years.

The proportion of older workers is 50% or above in the agricultural sector. This result indicates that, older people mostly employed in this sector. Older individuals are more likely to attach to this sector

⁸ The participation rate of younger workers (people aged 15-24) stabilized at around 45% in the last decade whereas the participation rate of the older workers (people aged 55-64) increased to around 45% in the last few years in the Eurozone (Balleer et al, 2009).

Figure 3
Employment Shares by Age Groups



Source: HLF5 database, TURKSTAT (1988-1995-2002-2010).

Besides, it can be seen that employment shares of the service sector show an increasing trend over the period. This is true for the manufacturing sector, as well. Hence, this result gives an evidence of the economic transformation of Turkey from the agricultural sector to the manufacturing and service sectors. The increase in the share of economic activities in manufacturing and service sectors leads to an increased labour demand for these sectors⁹.

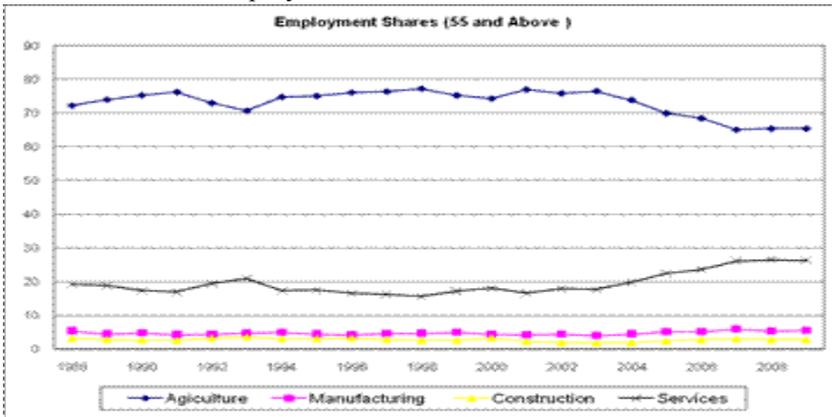
In the case of service sector, it can be seen that middle-aged groups (people aged 30-34 and 35-39) have the highest percentages. The employment share of this sector has an inverse-U shape. At first the employment share increases until the 30-34 age group where it peaks before starting to decrease. When the employment share of the manufacturing sector is investigated, it reveals that the employment share of older workers (55 and above) remains nearly the same for the investigated years. For instance, it is nearly 5% for the 55-59 age group and nearly 3% for the 65 and above age group for all the surveyed years. The nature of the manufacturing sector (technological progress, learning curve or skilled worker needs) prevent older individuals attached to this sector.

On the other hand, the employment share of agriculture has a U-shape. First, it decreases until the 30-34 age group and then it starts to increase. The employment share of agriculture is higher for 15-19 year-olds among the younger age groups. In 2010, it was 30%. It decreased to 15% as individuals get older (age group 20-24). It continues to steadily decrease as individuals get older, and this decrease continues until the 30-34 age-group before once more starting to rise. For people aged 65 and above, it reaches almost 80% over the years in question.

⁹ Turkey implemented structural reform programmes during the last two decades and changed its economic structural priorities from the agriculture to the manufacturing sector. The economic structure has been transformed from a predominantly agrarian economy towards one increasingly composed of sophisticated industrial and service activities. The employment level of the agricultural sector declined over the years. For instance, while the agricultural sector accounted for nearly 65% of total employment in 1970, it has since decreased to nearly 30% of the total employment. However, it is important to remember that the agricultural sector remains one of the important sectors in terms of its accounting for 30% of the total employment in the economy (Günçavdı et al., 2013).

In Figures 4a and 4b, the employment shares for older workers (people aged 55 and above) according to economic activities in Turkey are plotted in order to examine the time trends of share of employment for different sectors. The share of employment in the agricultural sector remained stagnant throughout the 1990s (with the exception of a dip in 1993) and underwent a rapid reduction starting in 2003. Over the period of 2003-2006, this rate continued to decline. This trend shows that the agricultural transformation accompanied by economic growth affected older workers. When the employment shares in agriculture for older individuals are compared those for younger ones, it should be stressed that older workers are mainly engaged in this sector. The main reason for this is the fact that older individuals face difficulties in finding non-agricultural jobs since non-agricultural jobs are more likely to require skilled workers. In addition, older individuals' adaptation to new technologies will be lower than younger individuals and thus employers do not want to hire older individuals.

Figure 4a
Employment Shares of Older Individuals

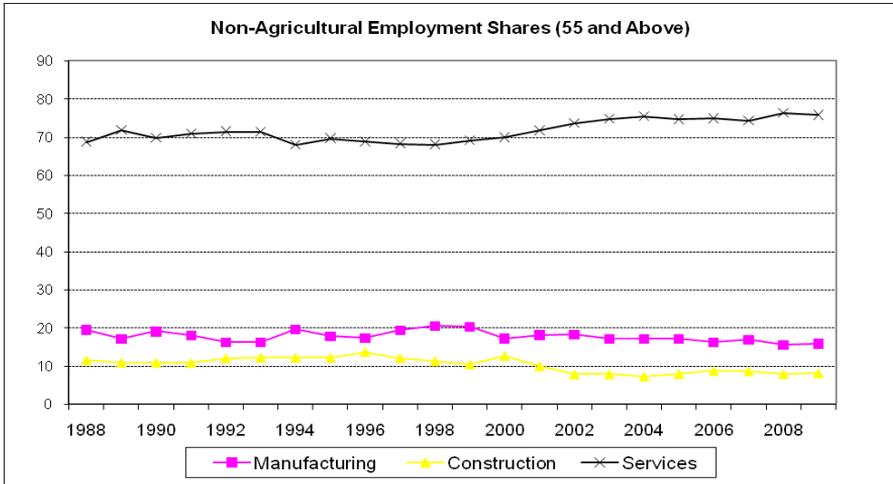


Source: HLFS database, TURKSTAT (1988-2009).

On the other hand, the data shows an increase in the share of employment in service sector among older individuals. This result is a reflection of the increasing share of service sector in Turkey¹⁰. When Figure 4a is examined, it can be seen that the increasing trend in the service sector becomes steeper after 2002. After a huge economic crisis in 2001, Turkey started to implement a new structural programme in order to achieve a sustainable economic growth and lower inflation rate. Therefore, the faster growth of the share of the service sector mainly comes from this structural adjustment programme.

¹⁰ With the structural transformation, the share of the service sector in Turkey increased from almost 25% to 50% between 1970 and 2005 (Günçavdı et al., 2013).

Figure 4b
 Non-Agricultural Employment Shares of Older Individuals



Source: HLFS database, TURKSTAT (1988-2009).

Figure 4b shows the data without the agricultural sector. It can be seen that the share of the employment level in the service sector has the highest share compared to the two other sectors among older workers. The share of the service sector is nearly three times higher than that of the manufacturing sector, for instance, while the employment rate of older workers in the service sector is around 75%, whereas the employment rate in the manufacturing sector is only around 20% for 2010. Briefly, in Turkey, the proportion of older individuals becomes higher over time. This could be an evidence for the ageing problem within the population of Turkey. This demographic trend gives rise to an ageing labour force and a decreasing of the population who are capable of working. However, if these older individuals attach to labour market, decreasing of the population who are capable of working may not be cause a problem for the labour market. Figure 1 reveals the fact that Turkey could face an ageing population problem in the near future. Besides, Figure 2 shows that the labour force participation of older individuals (over 55 years old) has a decreasing trend over time. This is probably due to the decreasing share of the agricultural sector in the total employment. To sum up, we want to examine whether there is another sector (aside from agrarian one) which has impact on the labour market attachment of older individuals. We examine this question revealing the effects of local labour market opportunities on the labour market attachment of older individuals.

3.4. *Share of enterprises among sectors*

It is also important to examine the structure of the enterprises in the sectors to understand the labour attachment of older workers. Table 1 depicts the proportion of the innovative and non-innovative enterprises in industry by economic activity and size¹¹. The proportion of innovative enterprises in the manufacturing sector is higher than the one in the service sector (For instance: 35.3% in manufacturing and 24.6% in the service sector in 2004 to 2006). In all service sub-sectors, the proportion of innovative enterprises is lower than in the industrial sub-sectors. Computers and related activities are an exception in service sub-sectors, and the proportion of innovative enterprises in computers and related activities is higher than the ones in industrial sub-sectors. Among the enterprises in computers and related activities, 46.9% of them are innovative. In addition to this, as the size of the enterprises grows larger, the proportion of innovative enterprises becomes higher. For example, 37.1% of the enterprises with ten or more employees were classed as being innovation active in the three-year period 2006 to 2009 while the percentage of enterprises with 10-49 employees engaged in innovative activities was 33.8%. These compare to 43.7% for the 50-249 group and 54.4% for the 250 and over group. If older individuals are less likely to invest in learning, it could be said that the more local enterprises in an economic activity that have a high proportion of innovative enterprises, the less the labour market attachment of older individuals will be (such as manufacturing or computer and related activities). More precisely, the more local enterprises in an economic activity that have a lower proportion of innovative enterprises, the higher the labour market attachment of older individuals (such as wholesale).

¹¹ The innovation survey was carried out by the Turkish Statistical Institute in compliance with Eurostat and OECD methodology. The innovation activities of enterprises with ten or more employees in the industrial and services sectors for the period from 2006 to 2008 were given. Innovation activities are classified as technological and non-technological innovations. Technological innovations comprise new products and processes and significant technological changes of products and processes. Non-technological innovations comprise a new marketing method, or a new organizational method in business practice.

Table 1
Innovative and Non-Innovative Enterprises in Industry by Economic Activity and Size (%)

	Innovative		Non innovative	
	2004-2006	2006-2008	2004-2006	2006-2008
General	31.4	29.8	68.6	70.2
Industry	35.3	34.2	64.7	65.8
Mining and Quarrying	25.1	22.7	74.9	77.3
Manufacturing	35.7	34.7	64.3	65.3
Electricity, gas & water supply	27.5	17.8	72.5	82.2
Services	24.6	23.2	75.4	76.8
Wholesale trade	28.4	24.5	71.6	75.5
Transport, storage and communication	14.9	18.3	85.1	81.7
Financial intermediation	24.6	23.1	75.4	76.9
Computer and related activities	46.9	59.2	53.1	40.8
Architectural, eng.& other tech. activities	22.1	20.2	77.9	79.8
Technical testing and analysis	25.1	29.0	74.9	71.0
Size				
Total	31.4	29.8	68.6	70.2
10-49	29.7	27.8	70.3	72.2
50-249	37.2	38.4	62.8	61.6
250+	43.5	48.6	56.5	51.4

Source: Innovation Survey, TURKSTAT.

4. Data and descriptive statistics

A brief summary of the main and supplementary data sources will be given in this section. Afterwards, we describe the descriptive statistics of the main data. During the investigation, the 2007-2008 HLFS (Household Labour Force Survey) compiled by TurkStat (Turkish Statistical Institute) is applied. The data includes questions on retrospective work history. Using this information, our aim is to identify the factors that determine the probability of labour market attachment for individuals who were retired the previous year. We categorize those who are willing to start work within 15 days' as the individuals who are marginally attached to the labour market. In other words, we examine the labour market behaviour of individuals who were retired the previous year by focusing on individuals who are employed, unemployed, marginally attached as well as those who do not have any labour market attachments. Thus, we use the term *labour market attachment*. In the empirical analysis, we use individuals' characteristics (such as gender, age and education level of an individual as independent variables in the regressions) by using 2007-2008 HLFS micro data sets.

Since HLFS covers a random sample of households in NUTS1 and NUTS2 level Turkey, we are able to question the effects of the opportunity

structure in the local labour market (NUTS2 level) on the labour market attachment of older individuals. In order to investigate these effects, we use another data source, the General Census of Industry and Business Establishments for the years 2007 and 2008. In this study, the General Census of Industry and Business Establishments data was used to assess Turkey's provincial and NUTS2 level industrial structure, and includes all the establishments whose purposes are to produce goods and services and who have accounting records are covered.

In addition, the other supplementary data source, the Address Based Population Registration System (ABPRS) used for the years 2007 and 2008 is an administrative data base for the entire population of Turkey. For each province, the ratios of employment in the given industries to the working age population of the province are computed and we use this ratio as one of the independent variables in the regression analysis. In order to compute this ratio, we use the working age population (individuals aged 15-64) of each province from ABPRS as a denominator while the provincial employment is used as a numerator.

$$EWR_{ij} = \frac{E_{ij}}{W_{ij}} \quad i=1,\dots,7 \text{ and } j=1,\dots,26$$

Where EWR_{ij} represents the employment working age population ratio in sector 'i' in NUTS 'j'. E_{ij} stands for the employment in sector 'i' in NUTS 'j' while W_{ij} shows the working age population in NUTS 'j'. We have seven different sectors (manufacturing, construction, retail sales and trade, hotels and restaurants, transportation communication, estate and other services). We have 26 NUTS. The provincial employment level to working age population ratios are used as a proxy for the industrial composition of the local labour market (this proxy variable could also be an indicator of labour demand).

Pooling the HLFS data for 2007 and 2008, there are 962,759 individuals: 481,605 in 2007 HLFS and 481,154 in 2008 HLFS (in Appendix A, Table A1). Since we are focusing on older individuals, the individuals younger than 55 years old are excluded. After these exclusions, the total number is 146,570 individuals. There are 38,954 (27% of 146,570) individuals who were retired the previous year, while there are around 19,500 individuals for each year¹². In addition, among these individuals who were retired the previous year, most of them live in urban areas: 30,433 (78%) while only 8,521 (22%) of them live in rural areas. For rural areas, the number of observations is very small in each cell; therefore the rural individuals have been excluded from our analysis. In Table 2, the status of the individuals in urban areas is shown¹³. The rows of the table show the

¹² Please see: Appendix A, Table A2, A3 and Table A4.

¹³ Inactive individuals are defined, as those who are not employed, not unemployed, not in school and not in military service.

status of the individuals at time t-1 while the columns show the status of the individuals at time t. The highlighted italic row depicts the number of individuals who were retired the previous year. Note that among 29,925 inactive individuals, 919 of them are ready to start working within 15 days. Hence, in our analysis, the binary dependent variable “being in the labour market/marginally attached to labour market” takes the value ‘1’ not only for employed (320) and unemployed (183) individuals but also for those marginally attached to the labour market (919). Summing up all of these individuals, there are 1422 individuals who are prepared to re-enter or who are marginally attached to the labour market (5% of 30,433).

Table 2
Status of Individuals, 55+, Urban

Urban Areas	Status (t)						
	Employment [a]	Unemployment [b]	Inactive [c]	School [d]	Total [e]	Marginally Attached to Labor Market [f]	Attached to Market [a+b+f]
Status (t-1)							
Employed	9707	173	882	0	10762	125	10005
<i>Retired</i>	<i>320</i>	<i>183</i>	<i>29925</i>	<i>5</i>	<i>30433</i>	<i>919</i>	<i>1422</i>
Unemp	209	456	398	0	1063	231	896
House Work	130	33	31588	1	31752	277	440
Education	0	0	2	0	2	0	0
Disabled, Ill	33	14	11406	0	11453	91	138
Military	0	0	0	0	0	0	0
Other	37	8	2848	0	2893	52	97
Total	10436	867	77049	6	88358	1695	12998

Source: HLFS 2007 and 2008.

Table 3 depicts the number of individuals, who were retired the previous year and who are attached to the labour market by their education level group in urban areas. For each education level group, the share of individuals attached to the labour market is shown by italic numbers. The highest attachment belongs to vocational high school graduates and university graduates. The results revealed that with an increase in education level, the attachment is also increased. At this point, whether the effects of the local labour market opportunities differ among different education levels or not remains the main question. In order to examine this, logistic regression models for each education level (illiterates and literates, 5-year and secondary school graduates, high school, vocational high school and university graduates) is applied.

Table 3
Labour Market Attachment of Older Individuals by Education Group, 55+,
Urban

	Illiterate	Literate	Primary 5 years	Secondary School	High School	Vocational High School	University	Total
Attached to labour market	1851	2768	14133	2823	1701	2113	3622	29011
<i>Shares</i>	0.982	0.976	0.954	0.946	0.944	0.937	0.937	0.953
Total	1884	2836	14807	2984	1801	2256	3865	30433

Source: HLFS 2007 and 2008.

5. Methodology

In this paper logistic regression analysis is preferred to examine links between local labour market opportunities and the labour market attachment of individuals. The common formula of the logistic regression model could be written as follows:

$$\Lambda \left(\beta_0 + \sum_{i=1}^n \beta_i * X_i \right) = \Pr(Y_i = 1 \mid X_i) = \frac{e^{\beta_0 + \sum_{i=1}^n \beta_i * X_i}}{1 + e^{\beta_0 + \sum_{i=1}^n \beta_i * X_i}} \quad (1)$$

where Y is the dependent variable that takes only 0 or 1 (binary choice) and X_i is refer to the independent variables. β_0 and β_1 are the parameters of the constant term and the independent variables. Being in the labour market or marginally attached to the labour market conditional on being retired the previous year is a dependent variable where education level, age, gender and the composition of local employment by industry as a proxy for the appropriateness of jobs are independent variables in our analysis. As stated before, we use the employment to population ratios of the NUTS2 level as independent variables. Therefore, we include a cluster correction to take into account that these variables are not independent across observations in the same NUTS¹⁴.

¹⁴ These explanatory variables are fixed at NUTS2 level while other explanatory variables vary at the individual level: $x_{ij}\beta = x_{1ij}\beta_1 + x_{2j}\beta_2$ where x_{1ij} represents the set of variables that vary at the individual level, while x_{2j} represents the set of variables that only vary at the group level (in our case NUTS2 level). Thinking in terms of omitted variables, we can write error term as: $\varepsilon_{ij} = \theta_j + u_{ij}$ where θ_j represents omitted Nuts2 level variables, while u_{ij} represents omitted factors that only vary at the individual level. For example, θ_j is thought as a ‘common’ or ‘macro’ shock and it equally affects all members of group j . From this error

In addition, we run the same regressions for young individuals (20-34 year-old) as a control group. By employing this control data, we are able to examine whether the impact of the local labour market structure on the labour market attachment of older individuals is different from that for younger individuals. We also run the models for each education groups in order to examine whether the effects of local labour market opportunities vary among different education groups.

6. Empirical results

The primary concern is to investigate the relationship between local labour market opportunities and the being in the labour market/marginally attached to the labour market of older individuals who were retired the previous year. The effects of NUTS2 level employment to working age population ratio on the behaviour of older individuals in the labour market are analysed. For this examination, logistic regression models with and without correcting the standard errors for clustering at NUTS2 level is applied.

Table 4 shows the marginal effects of parameter estimates from these logistic regression models¹⁵. At the bottom of the tables, incremental Likelihood Ratio tests, which are used to test whether all independent variables are jointly statistically significant, are given. The first two columns show the marginal effects of parameter estimates of our interest group (individuals 55+ in urban areas and the ones who were retired the previous year) while the last two columns show the models for 20-34 year-old urban individuals as a control group. First, we run models without correcting the standard errors by clustering at the NUTS2 level (Model 1 and Model 3) afterwards; we run the same logit models while correcting the standard errors (Model 2 and Model 4).

The results indicate that for older individuals, being male brings a 2.4% points increase the probability of labour market attachment. In the control group, the marginal effect of being male on labour market attachment is higher than for older individuals. It has a 55.8% points increase in the probability of labor market attachment. In addition, having a higher labour market re-entry for older males/marginally attached to the labour market than older females can be explained by the fact women have a comparative advantage in home production while men have comparative

structure, it follows that $Var(\varepsilon_{ij}) = Var(\theta_j) + Var(u_{ij})$. It also follows that $Cov(\varepsilon_{ij}, \varepsilon_{i'j'}) = Var(\theta_j)$ for the observation i and i' which are in the same Nuts2. In addition, for two observations i and i' which are not in the same NUTS2, $Cov(\varepsilon_{ij}, \varepsilon_{i'j'}) = 0$. This leads to the variance-covariance matrix of errors is no longer a diagonal matrix. In other words, it is block diagonal with each representing one of the NUTS.

¹⁵ In Appendix B, Table B1, the parameter estimates from logit models of being in the labour force/marginally attached to the labour market are given.

advantage in the labour market. This is in line with one of the implications of the Search Theory: that is, as home production orientation increases, the reservation wage increases.

The impact of aging shows variations between older individuals and younger individuals. For the case of individuals older than 55, being older decreases the probability of labour market attachment. A possible reason for this could be the fact that the rate of return on the investment in their human capital is not as valuable for older individuals since they have closer career horizons, as stated by the Human Capital Theory. Thus, older individuals do not want to update their knowledge. In addition, their reservation wage is higher as they get older (since they give high values to their leisure time). On the other hand, the opposite is true for the control group (20-34 year-olds): being older increases the probability of labour market attachment because young males have to become the main breadwinners to establish an independent household as they pass 20 years-old, since the average age at first marriage is 26.5 among men in 2010 in Turkey (Yanik-İlhan, 2012).

When we look at education level variables, having a higher education leads to an increase in the probability of labour market entry. This result is valid not only for older individuals but also for younger ones. One explanation from Human Capital Theory that is the fact that as education increases, individuals are more likely to participate since the opportunity cost of leisure is higher for more highly educated individuals. Comparing the marginal effects of education for older individuals with that for younger individuals shows that they are higher for younger individuals.

There is another important finding about the impacts of personal characteristics and education level on labour market attachment of older individuals. Note that, education levels lower than university lose their significance after correcting the standard errors at the NUTS2 level. However, there is no change in the case of the control group. This can be explained by the factors specific to NUTS are more likely to affect older individuals. In addition, for the case of a dummy year, although correcting the standard error does not lead to change the significance level of the dummy year in the model of older individuals, it does for the young individuals' model.

Up until this point, we have dealt with the personal characteristics of the individuals. From now on; we will look at the impact of local labour market opportunities on labour market attachment. Without correcting the standard errors for clustering, we find that a higher prevalence of jobs in manufacturing, hotels and restaurant increases the probability of labour market attachment for young individuals, while a higher prevalence of jobs in manufacturing, hotels and restaurants decrease the labour market attachment of older individuals. On the other hand, correcting the standard error for clustering at NUTS2 level, the effects of labour market opportunities in manufacturing, hotels and restaurants on the labour market

Table 4
Marginal Effects of Parameter Estimates from Logit Models

	Model (1) Age 55+	Model (2) Age 55+ (Cluster)	Model (3) Age 20-34	Model (4) Age 20-34 (Cluster)
<i>Personal Characteristics</i>				
Male	0.024*** (0.002)	0.024*** (0.004)	0.558*** (0.002)	0.558*** (0.016)
Age (20-24)			-0.150*** (0.004)	-0.150*** (0.013)
Age (25-29)			-0.020*** (0.004)	-0.020*** (0.005)
Age (60-64)	-0.013*** (0.002)	-0.013*** (0.002)		
Age (65 and above)	-0.048*** (0.002)	-0.048*** (0.006)		
<i>Education Level</i>				
Literate	0.007 (0.007)	0.007 (0.008)	0.162*** (0.007)	0.162*** (0.015)
Primary 5years	0.014** (0.005)	0.014* (0.007)	0.200*** (0.007)	0.200*** (0.015)
Secondary School	0.023* (0.009)	0.023* (0.009)	0.255*** (0.005)	0.255*** (0.013)
High school	0.030** (0.011)	0.03 (0.019)	0.214*** (0.006)	0.214*** (0.014)
Vocational high school	0.033** (0.011)	0.033* (0.015)	0.298*** (0.004)	0.298*** (0.012)
University	0.042*** (0.011)	0.042** (0.015)	0.401*** (0.003)	0.401*** (0.011)
<i>Years</i>				
Year 2008	0.015*** (0.002)	0.015*** (0.004)	0.023*** (0.003)	0.023* (0.01)
<i>Local Labour Market Opportunities</i>				
Manufacturing	-0.002*** (0.0004)	-0.002 (0.002)	0.001* (0.001)	0.001 (0.004)
Construction	0.005* (0.002)	0.005 (0.006)	0.011** (0.004)	0.011 (0.023)
Retail sales and trade	0.017*** (0.002)	0.017* (0.007)	0.042*** (0.002)	0.042* (0.017)
Hotels and restaurant	-0.004** (0.001)	-0.004 (0.004)	0.033*** (0.003)	0.033 (0.018)
Transportation Communication	0.002 (0.003)	0.002 (0.011)	-0.005 (0.005)	-0.005 (0.028)
Estate	-0.028*** (0.003)	-0.028*** (0.008)	-0.045*** (0.005)	-0.045 (0.026)
Other services	-0.044** (0.014)	-0.044 (0.076)	-0.245*** (0.026)	-0.245 (0.134)
Obs.	30,433	30,433	159,100	159,100
LR test: Incremental Chi-sq(d.f)	1253 (17)	2957 (17)	74135 (17)	7767 (17)
Prob <chi-sq	0	0	0	0
Log-Likelihood	-5118	-5118	-69606	-69606

Note: *** Significant at the 1% level; ** significant at the 5% level *significant at the 10% level¹⁶.

¹⁶ Robust Standard errors are corrected for clustering at NUTS2 level for model 2 and 4. The marginal effects are calculated for changes from 0 to 1 for dummy variables and for variables measured as proportions and infinitesimal changes for continuous variables. The reference

lose their significance. This confirms the presence of factors specific to each NUTS which is not controlled. However, these factors have effects not only on older individuals but also on younger individuals. It should be noted that these factors have also links with the manufacturing sector, restaurants and hotels.

As the opportunities in the estate sector increase, the lower the probability of labour market attachment not only older individuals but also for younger individuals. Although the standard errors grow substantially both of them, for the younger individuals, the results without clustering have so statistical significance that they are robust to the inclusion of clustering.

In order to test whether the effects of local labour market opportunities on labour market attachment are different for males and females, we run the same clustered models for males and females, separately. The results of this examination can be seen in Table 5¹⁷.

In Table 5, first two columns are for 55+ year-olds while the last two columns are for 20-34 year-olds. The results show that local labour market opportunities do not have any impact on older females while they do have effects on older males. As in the pooled data, the local labour market opportunities in the state have an impact on older males: a higher prevalence of jobs in the estate sector leads to a decrease in the probability of them being attached to the labour market (1 point increase in the ratio of employment in the estate sector to the working age of the population leads to a 3 point decrease in labour market attachment). However, it should be remembered that the effect of the estate sector is the same for young males, and is not specific to older individuals.

Being a university graduate for an older male increases the probability of their attachment to the labour force (a 5% higher probability than illiterate older males). Being a 5-year primary school graduate has a 3% higher probability. However, education does not have any effect on 55+ year-old females. For the case of 20-34 year-old males, each education level has an impact on their being attached to labour market. In addition, for the case of 20-34 year-old females, as education increases, the impact of that education increases. Being literate has a 1% higher probability while being a university graduate has a 67% higher probability.

individual is 55-59 years of age, female, illiterate for model 1-2 while age 30-34, female, illiterate for model 3-4. The reference year is 2007.

¹⁷ However, it should be noted that, we do not run the models by education groups. If we ran the models by education groups, we would be in trouble due to the fact that number of individuals in each education group is quite small.

Table 5
Marginal Effects of Parameter Estimates from Logit Models (By Gender)

	55+ years-old		20-34 years-old	
	Model (1) MALE	Model (2) FEMALE	Model (3) MALE	Model (4) FEMALE
<i>Personal Characteristics</i>				
Age (20-24)			-0.191*** (0.008)	-0.011 (0.013)
Age (25-29)			-0.025*** (0.003)	-0.012 (0.007)
Age (60-64)	-0.015*** (0.002)	-0.006* (0.002)		
Age (65 and above)	-0.058*** (0.007)	-0.014*** (0.004)		
<i>Years</i>				
Year 2008	0.017*** (0.004)	0.009* (0.004)	0.003 (0.002)	0.036* (0.015)
<i>Education Level</i>				
Literate	0.009 (0.01)	-0.001 (0.006)	0.046*** (0.002)	0.095*** (0.021)
Primary 5years	0.017* (0.008)	0.003 (0.007)	0.108*** (0.007)	0.103*** (0.019)
Secondary School	0.029** (0.011)	0.002 (0.007)	0.073*** (0.004)	0.245*** (0.021)
High school	0.04 (0.022)	-0.001 (0.009)	0.043*** (0.006)	0.356*** (0.021)
Vocational high school	0.035* (0.017)	0.022 (0.015)	0.067*** (0.003)	0.422*** (0.018)
University	0.051** (0.018)	0.014 (0.012)	0.065*** (0.003)	0.668*** (0.014)
<i>Local Labour Market Opportunities</i>				
Manufacturing	-0.002 (0.003)	-0.0003 (0.001)	-0.001 (0.001)	0.003 (0.006)
Construction	0.007 (0.007)	-0.003 (0.005)	0.001 (0.003)	0.021 (0.037)
Retail sales and trade	0.020* (0.008)	0.003 (0.004)	0.0004 (0.003)	0.064* (0.026)
Hotels and restaurant	-0.005 (0.005)	-0.002 (0.003)	0.001 (0.002)	0.037 (0.025)
Transportation Communication	0.001 (0.013)	0.007 (0.007)	0.004 (0.005)	-0.012 (0.041)
Estate	-0.033*** (0.009)	-0.006 (0.006)	-0.010** (0.004)	-0.058 (0.043)
Other services	-0.049 (0.09)	-0.025 (0.029)	0.027 (0.017)	-0.400* (0.201)
<i>Obs.</i>	25835	4598	74079	85021
<i>LR test: Incremental Chi-sq(d.f)</i>	2307	200.8	4656	1752
<i>Prob <chi-sq</i>	0	0	0	0
<i>Log-Likelihood</i>	-4723	-385.2	-17732	-45601

Note: *** Significant at the 1% level; ** significant at the 5% level *significant at the 10% level.

Table 6 depicts the marginal effects of parameter estimates from logit models for 55+ year-olds run by education groups (illiterates & literates, 5-year and secondary school graduates, high school, vocational high school and university graduates) while Table 7 is for 20-34 year-olds. We ran these models in order to test whether impacts of local labour market opportunities differ among education levels regarding labour market attachment. For older individuals, the impact of the estate sector is negative for 5-year and secondary school and more highly educated individuals. However, in the case of young individuals, it has no impact. In addition, for illiterate and literate 55+ year-old individuals, the prevalence of retail sales and trade employment increases the labour market attachment of those individuals (1% higher probability).

Table 6
Marginal Effects of Parameter Estimates from Logit Models for 55+ year-olds (By Education Group)

	Model (1) Illiterate & Literates	Model (2) Prim5 & Prim8	Model (3) High & Voc High & Uni
<i>Personal Characteristics</i>			
Male	0.014*** (0.004)	0.025*** (0.004)	0.034*** (0.006)
Age (60-64)	-0.012*** (0.003)	-0.014*** (0.002)	-0.013*** (0.004)
Age (65 and above)	-0.044*** (0.01)	-0.052*** (0.006)	-0.047*** (0.008)
<i>Years</i>			
Year 2008	0.008* (0.003)	0.014*** (0.004)	0.025** (0.008)
<i>Local Labour Market Opportunities</i>			
Manufacturing	-0.001 (0.001)	-0.002 (0.002)	-0.004 (0.004)
Construction	0.003 (0.005)	0.004 (0.007)	0.011 (0.008)
Retail sales and trade	0.009** (0.003)	0.016* (0.007)	0.025* (0.011)
Hotels and restaurant	0.00002 (0.003)	-0.003 (0.004)	-0.01 (0.007)
Transportation Communication	0.001 (0.005)	0.005 (0.01)	-0.005 (0.02)
Estate	-0.009 (0.006)	-0.030*** (0.009)	-0.038*** (0.011)
Other services	-0.045 (0.033)	-0.04 (0.077)	-0.062 (0.113)
<i>Obs.</i>	4720	17,791	7,922
<i>LR test: Incremental Chi-sq(d.f)</i>	84.02	1668	341.4
<i>Prob <chi-sq</i>	0	0	0
<i>Log-Likelihood</i>	-450.0	-3036	-1621

Note: *** Significant at the 1% level ; ** significant at the 5% level; *significant at the 10% level.

Table 7
Marginal Effects of Parameter Estimates from Logit Models for 20-34 year-olds (By Education Group)

	Model (1) Illiterate & Literates	Model (2) Prim5 & Prim8	Model (3) High & VocHigh & Uni
<i>Personal Characteristics</i>			
Male	0.652*** (0.043)	0.753*** (0.013)	0.290*** (0.014)
Age (20-24)	0.035 (0.025)	-0.023 (0.016)	-0.235*** (0.015)
Age (25-29)	-0.001 (0.013)	-0.025*** (0.007)	-0.023** (0.007)
<i>Years</i>			
Year 2008	0.035** (0.011)	0.040* (0.017)	0.020** (0.008)
<i>Local Labour Market Opportunities</i>			
Manufacturing	0.002 (0.008)	0.007 (0.007)	0.001 (0.003)
Construction	0.027 (0.048)	0.013 (0.037)	0.015 (0.017)
Retail sales and trade	0.037* (0.014)	0.078** (0.025)	0.018 (0.014)
Hotels and restaurant	0.024 (0.021)	0.054* (0.025)	0.014 (0.011)
Transportation Communication	-0.014 (0.025)	-0.037 (0.041)	0.006 (0.021)
Estate	-0.022 (0.032)	-0.052 (0.042)	-0.037 (0.019)
Other services	-0.268* (0.115)	-0.583* (0.23)	-0.054 (0.08)
<i>Obs.</i>	12460	73910	72730
<i>LR test: Incremental Chi-sq(d.f)</i>	185.1	5374	2524
<i>Prob <chi-sq</i>	0	0	0
<i>Log-Likelihood</i>	-5276	-26364	-36848

Note: *** Significant at the 1% level ; ** significant at the 5% level; *significant at the 10% level.

7. Conclusion

The main objective of this paper is to investigate the impacts of the local labour market opportunities on the labour market attachment of older workers. Older individuals' reservation wages are higher than those of younger individuals due to the fact that older individuals value leisure more, and this is true especially for retirees. Moreover, due to the constraints of

commuting long distances or migrating in search of employment, or those of learning new technological innovations, the job search activities of older individuals are likely to be limited to local opportunities.

In this paper, we test if human capital has an impact on the labour market attachment of older individuals. When we look at education level variables, having a higher education leads to an increase in the probability of labour market attachment which confirms Human Capital Theory. However, only having a university education increases the labour market attachment of older individuals. We also test whether local labour market opportunities have effects on the labour market attachment of older individuals who were retired the previous year. Having a higher prevalence of jobs in the estate sector decreases the labour market attachment of older individuals. In addition to these findings, we examine that being male increases the labour market attachment of older individuals. This is in line with one of the implications of Search Theory: that is, as home production orientation increases, reservation wage increases. Therefore, females are less likely to re-enter the labour market.

From these results, one can say that, labour market attachment of older individuals in Turkey is more likely to be related to supply side of the labour market not labour market demand conditions since the local labour market opportunities (except estate sector) have no impact on the labour market attachment of older individuals. In order to increase labour market attachment of older individuals, increasing human capital of older individuals should be highlighted. Considering supply side of labour market for older individuals, we are only able to control gender and education level of older individuals. However, there are many supply side related issues such as their health; their partner's working status and psychological and social attitudes in the society which makes them not attached to labour market after a certain age.

Appendix-A

Table A1
Number of Observations by Age Groups

Age Groups	Number of Obs.	Percentage
age 0-04	79815	0,0829
age 5-11	131325	0,1364
age 12-14	55837	0,0580
age 15-19	83919	0,0872
age 20-24	69059	0,0717
age 25-29	78126	0,0811
age 30-34	72254	0,0750
age 35-39	67820	0,0704
age 40-44	66224	0,0688
age 45-49	58819	0,0611
age 50-54	52991	0,0550
age 55-59	42008	0,0436
age 60-64	30944	0,0321
age 65+	73618	0,0765
Total	962759	1,00

Source: Pooled HLFS 2007 and 2007.

Table A2
Status of Individuals, 55+, Turkey (Pooled HLFS 2007 and 2008)

Status (t-1)	Status (t)				Total
	Employed	Unemployed	Inactive	School	
Employed	28300	213	151	0	30023
<i>Retired</i>	<i>500</i>	<i>204</i>	<i>38245</i>	<i>5</i>	<i>38954</i>
Unemployed	321	586	613	0	1520
House Work	304	39	45091	1	45435
Education	0	0	3	0	3
Disabled, Ill	81	16	24647	0	24744
Military	0	0	1	0	1
Other	159	8	5723	0	589
Total	29665	1066	115833	6	146570

Table A3
Status of Individuals, 55+, Turkey (HLFS 2007)

Year 2007 Status (t-1)	Status (t)				
	Employed	Unemployed	Inactive	School	Total
Employed	13858	79	653	0	14590
Retired	288	82	18956	2	19328
Unemployed	166	274	305	0	745
House Work	180	17	22697	1	22895
Education	0	0	3	0	3
Disabled, Ill	40	10	11818	0	11868
Military	0	0	0	0	0
Other	95	5	2939	0	3039
Total	14627	467	57371	3	72468

Table A4
Status of Individuals, 55+, Turkey (HLFS 2008)

Year 2008 Status (t-1)	Status (t)				
	Employed	Unemployed	Inactive	School	Total
Employed	14442	134	857	0	15433
Retired	212	122	19289	3	19626
Unemployed	155	312	308	0	775
House Work	124	22	22394	0	22540
Education	0	0	0	0	0
Disabled, Ill	41	6	12829	0	12876
Military	0	0	1	0	1
Other	64	3	2784	0	2851
Total	15038	599	58462	3	74102

Appendix-B

Table B1
Parameter Estimates from Logit Models of Being in the Labour
Force/Marginally Attached to Labour Market

	Model (1)	Model (2)	Model (3)	Model (4)
	Age 55+	Age 55+ (Cluster)	Age 20-34	Age 20-34 (Cluster)
Male	1.186*** (0.116)	1.186*** (0.143)	2.964*** (0.015)	2.964*** (0.090)
Age (20-24)			-0.671*** (0.017)	-0.671*** (0.053)
Age (25-29)			-0.094*** (0.016)	-0.094*** (0.024)
Age (60-64)	-0.509*** (0.066)	-0.509*** (0.051)		
Age (65 and above)	-1.586*** (0.075)	-1.586*** (0.085)		
Literate	0.215 (0.217)	0.215 (0.211)	0.922*** (0.050)	0.922*** (0.095)
Primary 5 years	0.491*** (0.184)	0.491** (0.198)	1.005*** (0.040)	1.005*** (0.078)
Secondary school	0.628*** (0.198)	0.628*** (0.166)	1.595*** (0.043)	1.595*** (0.093)
High school	0.756*** (0.209)	0.756** (0.309)	1.191*** (0.042)	1.191*** (0.093)
Voc high school	0.808*** (0.201)	0.808*** (0.222)	2.007*** (0.043)	2.007*** (0.090)
University	1.006*** (0.193)	1.006*** (0.208)	3.371*** (0.045)	3.371*** (0.099)
Year 2008	0.525*** (0.061)	0.525*** (0.124)	0.109*** (0.014)	0.109** (0.045)
Manufacturing	-0.070*** (0.013)	-0.070 (0.087)	0.007** (0.003)	0.007 (0.021)
Construction	0.187** (0.077)	0.187 (0.212)	0.049*** (0.017)	0.049 (0.107)
Retail sales and trade	0.586*** (0.054)	0.586** (0.235)	0.194*** (0.011)	0.194** (0.082)
Hotels and restaurant	-0.147*** (0.048)	-0.147 (0.151)	0.152*** (0.013)	0.152* (0.081)
Transportation & Communication	0.060 (0.090)	0.060 (0.376)	-0.023 (0.022)	-0.023 (0.130)
Estate	-0.965*** (0.095)	-0.965*** (0.318)	-0.211*** (0.022)	-0.211* (0.122)
Other services	-1.539*** (0.503)	-1.539 (2.581)	-1.141*** (0.121)	-1.141* (0.623)
Constant	-5.467*** (0.291)	-5.467*** (0.604)	-2.511*** (0.054)	-2.511*** (0.238)
<i>Obs.</i>	30,433	30,433	159,100	159,100
<i>LR test: Incremental Chi-sq(d.f)</i>	1253 (17)	2957 (17)	74135 (17)	7767 (17)
<i>Prob <chi-sq</i>	0	0	0	0
<i>Log-Likelihood</i>	-5118	-5118	-69606	-69606

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Base Category is female, age 55-59, illiterate, year 2007 for model 1-2. Base Category is female, age 30-34, illiterate, year 2007 for model 3-4.

Table B2
Parameter Estimates from Logit Models of Being in the Labour
Force/Marginally Attached to Labour Market (By Gender)

	55+ years-old		20-34 years-old	
	Model (1) MALE	Model (2) FEMALE	Model (3) MALE	Model (4) FEMALE
Age (20-24)			-2.415*** (0.079)	-0.052 (0.058)
Age (25-29)			-0.512*** (0.057)	-0.056* (0.032)
Age (60-64)	-0.509*** (0.063)	-0.559** (0.226)		
Age (65 and above)	-1.599*** (0.083)	-1.333*** (0.363)		
Year 2008	0.246 (0.224)	-0.106 (0.588)	0.067* (0.039)	0.161** (0.067)
Literate	0.246 (0.224)	-0.106 (0.588)	2.614*** (0.279)	0.407*** (0.089)
Primary5years	0.512** (0.205)	0.284 (0.508)	3.277*** (0.270)	0.458*** (0.080)
Secondary School	0.662*** (0.162)	0.184 (0.522)	3.266*** (0.317)	1.021*** (0.087)
High school	0.835*** (0.287)	-0.075 (0.849)	1.271*** (0.248)	1.503*** (0.094)
Voc high school	0.764*** (0.236)	1.185** (0.544)	2.687*** (0.267)	1.802*** (0.089)
University	1.019*** (0.207)	0.930 (0.613)	2.627*** (0.237)	3.423*** (0.114)
Manufacturing	-0.073 (0.085)	-0.027 (0.115)	-0.018 (0.012)	0.012 (0.027)
Construction	0.202 (0.213)	-0.230 (0.440)	0.023 (0.063)	0.094 (0.165)
Retail sales and trade	0.599** (0.245)	0.292 (0.332)	0.010 (0.057)	0.289** (0.118)
Hotels and restaurant	-0.143 (0.151)	-0.186 (0.276)	0.025 (0.051)	0.169 (0.114)
Transportation&Communication	0.033 (0.376)	0.613 (0.609)	0.089 (0.098)	-0.053 (0.185)
Estate	-0.985*** (0.321)	-0.500 (0.546)	-0.224*** (0.084)	-0.264 (0.193)
Other services	-1.475 (2.632)	-2.202 (2.583)	0.604* (0.365)	-1.809** (0.915)
Constant	-4.313*** (0.593)	-4.856*** (1.551)	1.149*** (0.270)	-2.746*** (0.358)
<i>Obs.</i>	25,835	4,598	74,079	85,021
<i>LR test: Incremental Chi-sq(d.f)</i>	2307	200.8	4656	1752
<i>Prob <chi-sq</i>	0	0	0	0
<i>Log-Likelihood</i>	-4723	-385.2	-17732	-45601

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table B3
 Parameter Estimates from Logit Models of Being in the Labour
 Force/Marginally Attached to Labour Market for 55+ year-olds (By
 Education Groups)

	Model (1) Illiterate & Literate	Model (2) Prim5 & Prim8	Model (3) High & VocHigh& Uni
Male	1.277*** (0.423)	1.331*** (0.206)	1.080*** (0.173)
Age (60-64)	-1.154*** (0.299)	-0.526*** (0.071)	-0.382*** (0.104)
Age (65 and above)	-1.754*** (0.276)	-1.685*** (0.077)	-1.391*** (0.132)
Year 2008	0.509** (0.210)	0.455*** (0.120)	0.655*** (0.210)
Manufacturing	-0.072 (0.078)	-0.058 (0.075)	-0.094 (0.121)
Construction	0.215 (0.334)	0.140 (0.237)	0.283 (0.218)
Retail sales and trade	0.624*** (0.205)	0.554** (0.249)	0.664** (0.262)
Hotels and restaurant	0.011 (0.205)	-0.092 (0.138)	-0.265 (0.196)
Transportation & Communication	0.076 (0.308)	0.156 (0.346)	-0.143 (0.528)
Estate	-0.566 (0.349)	-1.017*** (0.327)	-0.998*** (0.336)
Other services	-2.974 (2.259)	-1.334 (2.560)	-1.619 (2.873)
Constant	-5.566*** (0.665)	-5.112*** (0.730)	-4.440*** (0.861)
<i>Obs.</i>	4,720	17,791	7,922
<i>LR test: Incremental Chi-sq(d.f)</i>	84.02	1668	341.4
<i>Prob <chi-sq</i>	0	0	0
<i>Log-Likelihood</i>	-450.0	-3036	-1621

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table B4

Parameter Estimates from Logit Models of Being in the Labour Force/Marginally Attached to Labour Market for 20-34 year-olds (By Education Groups)

	Model (1) Illiterate & Literates	Model (2) Prim5 & Prim8	Model (3) High & VocHigh & Uni
Male	3.155*** (0.290)	4.671*** (0.095)	1.573*** (0.073)
Age (20-24)	0.191 (0.138)	-0.102 (0.072)	-1.209*** (0.067)
Age (25-29)	-0.008 (0.073)	-0.116*** (0.033)	-0.125*** (0.038)
Year 2008	0.191*** (0.064)	0.183** (0.079)	0.111*** (0.043)
Manufacturing	0.008 (0.046)	0.034 (0.030)	0.005 (0.014)
Construction	0.148 (0.260)	0.061 (0.168)	0.084 (0.091)
Retail sales and trade	0.205*** (0.079)	0.355*** (0.117)	0.102 (0.075)
Hotels and restaurant	0.135 (0.121)	0.247** (0.111)	0.078 (0.060)
Transportation Communication	-0.075 (0.139)	-0.167 (0.188)	0.036 (0.113)
Estate	-0.123 (0.175)	-0.236 (0.192)	-0.205* (0.106)
Other services	-1.476** (0.636)	-2.662** (1.042)	-0.299 (0.442)
Constant	-2.507*** (0.334)	-2.144*** (0.374)	0.273 (0.234)
Obs.	12460	73910	72730
LR test: Incremental Chi-sq(d.f)	185.1	5374	2524
Prob <chi-sq	0	0	0
Log-Likelihood	-5276	-26364	-36848

References

- ACEMOĞLU, D. and ANGRIST, J. (2001), "Consequences of Employment Protection? The Case of the American with Disabilities Act", *Journal of Political Economy*, 109, 5.
- AHITUV, A. and ZEIRA, J. (2004), "Technical Progress and Early Retirement", John F. Kennedy School of Government Faculty Research Working Paper Series, KSG Working Paper No. RWP02-007.
- AUBERT, P., CAROLI, E. and ROGERS, M. (2006), "New Technologies, Organization and Age: Firm Level Evidence", *Economic Journal*, 116, 509: F73 – F93.
- BALLEER, A., GOMEZ-SALVADOR, R. and TURUNEN, J. (2009), "Labour Force Participation in the Euro Area A Cohort Based Analysis", European Central Bank, Working Paper Series No:1049.
- DANIEL, K. and SIEBERT, W. S. (2005), "Does Employment Protection Reduce the Demand for Unskilled Labour?", *International Economic Journal*, 19: 1-26.
- GRUBER, J. and WISE, D. (2004), "Social Security and Retirement Around the World: Micro-estimates", 2004, Chicago University Press: Chicago.
- GÜNÇAVDI, Ö., KÜÇÜKÇİFÇİ, S. ve BAYAR, A. A. (2013), "Economic Development and Structural Change: The Role of the Agriculture Sector in Turkey", *Middle East Development Journal*, forthcoming in June 2013.
- HAKOLA, T. and UUSITALO, R. (2005), "Not so voluntary retirement decisions? Evidence from a pension reform", *Journal of Public Economics*, 89 (11-12), 2121-2136.
- HALLBERG, D. (2008), "Economic Fluctuations and Retirement of Older Employees", IFAU-Institute for Labour Market Policy Evaluation Working Paper 2.
- HEYWOOD, J.S. and SIEBERT, W.S. (2009), "Understanding the Labour Market for Older Workers: A Survey", IZA Discussion Paper No. 4033.
- HUMPHREY, A., COSTIGAN, P., PICKERING, K., STRATFORD, N. and BARNES, M. (2003), "Factors Affecting The Labour Market Participation of Older Workers", DWF Research Report 200.
- HURD, M. (1990), "Research on the Elderly: Economic Status, Retirement, and Consumption and Saving," *Journal of Economic Literature*, 28 (June, 1990), 565-637.
- (1996). "The Effect of Labour Market Rigidities on the Labour Force Behaviour of Older Workers", in D Wise (edition), *Advances in the Economics of Aging*. Chicago: The University of Chicago Press.
- IRVING, P., STEELS, J. and HALL, N. (2005), "Factors affecting the Labour Market Participation of Older Workers: Qualitative Research", DWP-Department for Work and Pensions, Research Report No. 281.
- LAHEY, J. (2006), "State Age Protection Laws and the Age Discrimination in Employment Act", Working Paper 12048. Cambridge MA: National Bureau of Economic Research.
- MEADOWS, P (2003), "Retirement Ages in the UK: A Review of the Literature" Employment relations Research Series 18: London; Department of Trade and Industry, Retrieved February 7, 2005.
- McNAIR, S., FLYNN, M. and OWEN-HUSSEY, L. (2006), "Older Workers in the South East" South East England Development Agency and Centre for Research into the Older Workforce, SEEDA Working Paper.
- OECD (2005), "Ageing and Employment Policies", Organisation for Economic Cooperation and Development, Paris, France.
- SPO, (2007) "The Situation of Elderly People in Turkey and National Plan of Action on Ageing", Ankara.
- TUNALI, İ., (2003), "Background Study on Labour Market and Employment in Turkey", European Training Foundation, June, Ankara.

- UNFPA, (1998), “Population Ageing: Background Review”, United Nations Population Fund.
- VILLOSO, C., DI PIERRO, D., GIORDANENGO, A., PASQUA, P. and RICHIARDI, M. (2008), “Working Conditions of an Ageing Workforce”, Office for Official Publications of the European Communities, Dublin.
- WINKELMANN-GLEED, A. (2009), “Demographic Change and Implications for Workforce Ageing in Europe – Raising Awareness and Improving Practice”, WLRI- Working Lives Research Institute Working paper.
- WINKELMANN, L. and Winkelmann, R. (1998), “Why are the Unemployed So Unhappy? Evidence from Panel Data”, *Economica*, 65, 1–15.
- YANIK-İLHAN, B. (2012), “Youth in the Labour Market and the Transition from School to Work in Turkey”, PhD diss., Middle East Technical University.

Özet

Yaşlı nüfusun işgücü piyasasına bağlılığı: Türkiye örneği

Kariyerlerinin sonlarına yaklaşmış yaşlı bireylerin işgücü piyasasına bağlılığı, gençlerinki ile karşılaştırıldığında farklı olacağı aşikârdır. Genel olarak, yaşlı bireyler beşeri sermayelerine yatırım yapmak istememektedirler. Bu bağlamda, bu çalışmanın amaçlarından biri, beşeri sermayenin işgücüne bağlılığa olan etkisini incelemektir. Yaşlı bireylerin seyahat ve göç etmede kısıtları olması, iş ararken de bu kısıtlarla karşılaşmaları ve bununla birlikte yeni teknolojiyi öğrenmede zorlanmaları nedeniyle bu bireyler yerel işgücü piyasalarındaki olanaklar ile yetinmek durumunda kalmaktadırlar. Bu çalışmanın bir diğer amacı da yerel işgücü piyasalarının yaşlı bireylerin işgücü piyasasına bağlılıklarına olan etkisinin incelenmesidir. Diğer bir deyişle, bu makalede, yaşlıların işgücüne bağlılığı sadece işgücünün arz tarafı ile değil talep tarafıyla da ele alınmaktadır. Türkiye İstatistik Kurumu tarafından toplanan 2007-2008 Hanehalkı İşgücü Anketi ve Genel İşyeri Sayımı Anketleri kullanılarak analizler gerçekleştirilmiştir. Elde edilen bulgulara göre, üniversite mezunu olmak yaşlıların işgücüne bağlılığını arttırmaktadır. Emlak sektöründeki iş olanaklarının artması yaşlıların işgücüne bağlılığının düşmesine neden olmaktadır. Kısacası, Türkiye’deki yaşlı nüfusun işgücü piyasasına bağlılığı, işgücü piyasası talebi değil daha çok arz tarafıyla ilgili konularla ilişkilidir.

Anahtar Kelimeler : Yaşlılar, Yerel işgücü piyasası, İşgücüne bağlılık, Teknik İlerlemesi.

JEL Sınıflaması: J00, J14, J26, O33