75443

State Planning Organization of the Republic of Turkey
and
World Bank

Welfare and Social Policy Analytical Work Program

Working Paper Number 2:

Recent Trends in Female Labor Force Participation in Turkey

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Ankara, March 2010

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Abstract

The female labor force participation level in Turkey is currently very low at 27% compared with the OECD and EU-19 averages of 61 and 64% respectively. This rate has been declining in the last 30 years from a level of 48% in 1980. This paper looks at the most recent trends and profiles of labor force participation of women in Turkey using three different household level data sources in available Turkey (HBS, LFS and TDHS) for the period 2003-2006. The paper also reports a multivatiate analysis on the probability of working for women, controlling for various characteristics.

1. Introduction

1. **Turkey has low and declining levels of female labor force participation with only about one-in-four women in the working age population being active in the labor market as of 2006.** With 26.7% participation rate, Turkey has the lowest female labor force participation among OECD and EU-19 countries, where the averages are 61% and 64% respectively as of 2007. When Turkey is compared to a sample of 62 countries from the World Development Indicators, that includes many comparable developing countries, the result stays the same: Turkey has the 5th lowest level of female labor force participation: there are only 4 countries in the WDI data that have lower levels of female participation than Turkey and these are: Saudi Arabia, Egypt, Oman and Morocco. Even countries that historically report low levels of participation such as the Islamic Republic of Iran, Pakistan, Syria and Libya are currently reporting higher levels on this indicator when compared to Turkey. Again, according to the WDI 2008, female labor force participation rate (28%) for Turkey in 2006 was recorded below the averages of the Latin America and Caribbean (53%) and East Asia and Pacific (66%) regions.

2. **Turkey did not have such low levels of participation for women 30 years ago.** In 1980, Turkey was comparable in terms of its female labor force participation rate with the Netherlands, Austria, Australia and Switzerland (in the same WDI sample of 62 countries) with 48.3% of women in working age group participating in the labor force. Figure 1 provides a scatter plot of female and male labor force participation rates for all countries available in the WDI dataset for 1980 and 2006. The horizontal lines on Figure 1 show the levels of participation for women in Turkey. The countries below the horizontal line are the ones that have lower rates of female labor force participation in the sample when compared to Turkey.

3. **Understanding the falling trend in female labor participation requires looking at the recent trends and changes in the labor profiles of women in Turkey.** This paper considers the most recent profile of female labor force using available datasets at the household level between the years 2003 and 2006. The current profiles and changes for the given period are identified for various groups by education level, work status, type and sector of employment.

Figure 1: Female Labor Force Participation in Turkey has Declined Significantly Over Time (Changes between 1980 – 2006)
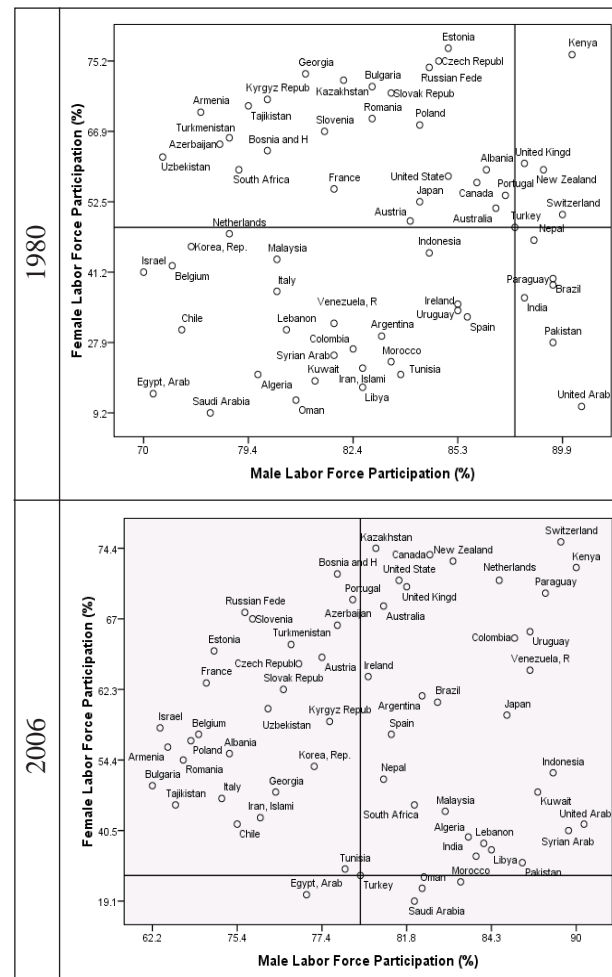
Source: WDI 2008 and Authors' calculations

4. **Previously, there have been a number of studies on female labor force participation in Turkey.** In some studies (See Kasnakoglu and Dayioglu, 2002), the main driving force for women to participate is stated as the market wage level being below the reservation wage level of women in Turkey, which corresponds to the total value of home production for women. Some of these economic studies (See Kasnakoglu and Dayioglu, 1997) have also argued that wage differences among genders are keeping women out of the labor market. Some other studies (See Alkan, 1995; Ozar and Günlük-Şenesen, 1998; Eyuboglu et al, 2000; Erman, 2001; Kasnakoglu and Dayioglu, 2002; Gunduz-Hosgor and Smits, 2006; Pancaroglu, 2006) have focused on the social roles of women in determining women's decision on labor market participation. A considerable number of papers (See Erman, 1998; Kocak, 1999; World Bank, 2000,

2004; Gunduz-Hosgor and Smits, 2006; SPO, 2007; Turkonfed, 2007) have emphasized that migration from rural to urban areas has been a determinant in the declining trend in female labor force participation in Turkey. Among the new urban migrants, women from rural areas who worked previously as unpaid family workers, become unemployed or unable to participate in the urban labor market. Other important factors that determine women's labor force participation are found as early exit, child care (See Ozar and Günlük-Şenesen, 1998; Dayioglu, 2000; Pancaroglu, 2006). Dayioglu (2000) has evidenced that especially the presence of young children negatively affects the participation decision of women.

5. **This paper aims to look at the changing profiles of women's labor force participation between 2003 and 2006 in light of the literature presented.** The contributions of this paper are the comprehensive look at trends over several consecutive years; and the multivariate structural analysis over several years. The data available from household level surveys is analyzed for levels and trends in female labor force participation in this time period taking a closer look at the profiles of women's activity in the labor market over time. Following the introduction, **Section-2** provides the data sources for the paper. **Section-3** analyzes changes in labor force participation of women (between 2003 and 2006) and considers profiles of participation by education levels, employment categories and sectors. This section also briefly analyzes earnings differentials between men and women in Turkey by education levels. **Section-4** focuses on the potential effects of various "life events" such as marriage, pregnancy, childbirth and migration on labor force participation. This is followed in **Section-5** by a more detailed multivariate analysis, where the probability of a woman working is interacted with explanatory variables in the previous sections. Finally, **Section-6** concludes by stating the main findings of the paper.

2. Data and Methodology

6. The paper builds on three different household level data sources: (i) Turkey Household Labor Force **Survey** (LFS) 2003-2006 (ii) Turkey Household Budget Survey (HBS) 2003-2006 and (iii) Turkey Demographic and Health Survey (2003).

7. The Labor Force Survey provides information on the structure of the labor force in the country. In this paper, the LFS is used for reporting changes in participation rates as well as the profiles by sector and type of employment. The quarterly sample size for the LFS is 37,000 households and yearly estimates for Turkey are provided at the rural-urban, NUTS 1 levels making this the largest and most reliable dataset for reporting labor force statistics in Turkey. In this paper we use 4 years of the LFS dataset: between 2003 and 2006.

8. Household Budget Survey (HBS) is the data source used for the measurement of consumption and poverty statistics in Turkey. In 2003, HBS had 25,764 households in the sample and provided regional estimations at the NUTS-1 level. In the following years, the survey size was reduced to 8,640 households and provided estimations at the national as well as urban and rural levels in Turkey.[1] The earnings data collected by HBS is more detailed and more reliable than the LFS. Therefore, for the analyses related to earnings in this paper we use HBS,[2] whereas for employment and labor force statistics we revert to LFS datasets. The HBS data set is also used in this paper for the 4 years of data available: 2003-2006.

9. The Turkey Demographic Health Survey (TDHS), conducted by Hacettepe University Institute for Population Studies, is used as the third data source in this paper. We use the most recent data available from this survey at the time of publication, which comes from 2003. The reason why we utilize the TDHS survey is that it not only provides one cross-section of data but has very rich information (in the ever-married women module) on background variables for the women 'interviewed such as fertility, husband's background, region and place of birth, migration as well as some social and cultural values proxy variables. We use this data set in Section 5 and 6 of this paper.

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[1] TUİK, Official Statistics Program 2007-2011, pp.24

[2] Since the main purpose of the HLFS is to provide labor force statistics, income and wage statistics will be derived from the HBS as it is specifically designed to collect income and expenditure of households. The new series (ILO definition adopted) started with the October 1988 survey. In 2004, number of questions in the LFS increased from 47 to 98, but there was not any change regarding the definition of the variables used in this study. Sampling design of the HLFS includes a three-month period (quarters) and monthly field implementation. Sample design is contracted on yearly basis. Yearly estimates of the whole of Turkey, rural-urban, SRE (Classification of Statistical Region Units. SRE-1 level has 12 region units, SRE-2 has 26 sub-region units) level 1 (urban-rural) and SRE level 2 are provided.

10. The analyses regarding profiles and changes in female labor are produced through cross-tabulations derived from the "ADePT Labor[3]" software program, which creates standard tables and graphs of labor markets. In order to run the program successfully, certain variables were used to produce the tables (For detailed definitions of each variable used in the software see Annex 1).

11. Two data constraints are important to note here in terms of the analysis: The first is that we limit our analysis to the years 2003 and 2006 as these are the years for which comparable household level data sets are available from TUIK. Secondly, all data used in this paper is cross-sectional nature as in Turkey there is not yet a panel data set available that would allow us to carry out a more dynamic analysis on the changes in the labor market for women. It is worthwhile to keep these data constraints in mind while reading through the next sections.

12. Regarding the compatibility of the TDHS and LFS, we are aware that the employment question in TDHS asks the women if she has worked in the last month, whereas the reference period for the respective question in LFS is the last week. For deriving labor statistics we conducted all our analyses on LFS. We conducted the multivariate analyses on the probability of women being active by using the TDHS, since the survey provided detailed information on women's and husband background, and also socio-cultural values.

3. Overall Levels of Female Labor Force Participation in Turkey

13. **Only about 1-in-4 women in Turkey in the working age population are currently active in the labor market.** As of 2006, 26.7% of women in the working age group were active in the labor market and only about 23.9% of them were actually employed. The decline in the level of female participation, which was outlined in Figure 1 in the introduction, still continues to this day and the detailed analysis of labor force data between 2003 and 2006 show that the percentage of active female population in the labor market has declined from 28.1% in 2003 to 26.7% in 2006. This trend has been

accompanied in the same time period by an increase in the percentage of discouraged female workers in the population from 0.6% to 4.6% (See Table 1).

Table 1: Hierarchical Decomposition of Working-Age Population by Gender (2003-2006)

			2003	2004	2005	2006
Women	Active	Employed	25.1	24.3	23.7	23.9
	Inactive	Unemployed[4]	3.0	2.7	2.8	2.8
		Other inactive	71.3	70.4	69.6	68.7
		Discouraged	0.6	2.6	3.9	4.6
	All Working Age		100.0	100.0	100.0	100.0
Men	Active	Employed	45.6	46.0	45.9	45.9
		Unemployed	5.5	5.5	5.4	5.2
	Inactive	Other inactive	48.1	45.8	45.0	44.5
		Discouraged	0.8	2.7	3.7	4.4
	All Working Age Men		100.0	100.0	100.0	100.0

Source: ADePT Labor results, LFS 2003-2006 and Authors' calculations

14. **Informality remains high in women's employment in Turkey with 66% of female employment being unregistered employment (compared to 34% for men).** The proportion of women employed informally has come down from 71% in 2003 to 66% in 2006, following closely the decline in the percentage of unpaid family workers (See Table 2). As of 2003, 48.3% of women employed in Turkey were employed as unpaid family workers. In 2006, this level has declined by 10 percentage points, down to 38.3%. In the same time period, the proportion of women employed informally has also come down as a result of such a large reduction in the percentage of women working as unpaid family workers, and an increase in registered workers that does not match up to this reduction in scale: The percentage of women who work as registered regular employees has increased in this time period by 5 percentage points, from 27.4% to 31.9 %. The net effect of the reduction in the number of unpaid family workers in the economy has been a reduction in the total proportion of informality for female workers but an overall reduction in total employment has also followed this decrease.

15. **Unpaid family workers, who are mostly employed in agricultural enterprises of their households,**

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[3]   The program has been developed by Michael Lokshin, Sergiy Radyakin and Zurab Sajaia in the Development Economics Unit of the World Bank, under the guidance of Michael Ravallion. For more information on the ADEPT software please visit http://econ.worldbank.org/programs/poverty/adept

[4]   Based on the International Labor Organization (ILO) definition. In addition to TUİK definitions please see ILO definitions on employment in Annex-2.

still make up the largest category of working women in Turkey and the agricultural sector remains the largest employer of women. Of the women active in the labor force, 47% are employed in the agricultural sector and of these 74% are employed as unpaid family workers as of 2006. In fact, the trend in the percentage of women's employment in the agricultural sector follows very closely the trend in the percentage of women who work as unpaid family workers. From 2003 to 2006, there is a 9.8 percentage point decline in the proportion of women in the agricultural sector going down from 57% of the labor force to about 47% (see Table 3). Services[5] and manufacturing follow as the second (37.4%) and third (14.6%) largest sectors for employing women in 2006.

Table 2: Employment Categories, Shares in Female Employment

	2003	2004	2005	2006	Change
Registered regular employee	27.4	26.8	29.8	31.9	4.5
Unregistered regular employee	6.1	7.7	9.6	10.3	4.2
Registered casual employee	0.3	0.2	0.1	0.2	0
Unregistered casual employee	5.8	5.8	5.6	5.4	-0.3
Registered Employer	0.6	0.6	0.6	0.8	0.2
Unregistered Employer	0.2	0.2	0.3	0.4	0.2
Registered self-employed	1.1	0.9	1.1	1.3	0.2
Unregistered self-employed	10.4	8.8	12	11.4	1.0
Unpaid family worker	48.3	49.0	40.9	38.3	-10.0
TOTAL	100	100	100	100	

Source: ADePT Labor results, LFS 2003-2006 and Authors' calculations

16. Table 3 provides the distribution of the female employed by sector between 2003 and 2006 where we observe the rapid reduction in female employment in agriculture in these years and the 8.4% rise in employment (as a percentage of the total) in the services sector. While it seems from the data below, that there may have been a shift in employment in agriculture into services, when we look at absolute levels of employment and labor force participation, we observe that those leaving the agricultural sector are likely to not be fully absorbed into other sectors of employment.[6]

Table 3: Distribution of the Female Employed by Economic Sector

	2003	2004	2005	2006	change
Sector of Activity					
Agriculture, forestry and fishing	57.0	55.8	50.2	47.2	-9.8
Mining	0.0	0.0	0.0	0.0	-0.0
Manufacturing	13.2	13.9	14.8	14.6	1.4
Electricity, gas and water supply	0.1	0.1	0.1	0.1	-0.0
Construction	0.5	0.5	0.5	0.6	0.1
Services	29.1	29.7	34.3	37.4	8.4
*Wholesale retail trade, restaurants and hotels	8.3	9.0	10.5	11.9	3.6
*Transportation, communication and storage	1.1	1.1	1.3	1.4	0.3
*Financial intermediation, real estate, renting and business activities	3.4	3.9	4.3	4.9	1.5
*Public and Government services, education, health and social work, community Services	16.3	15.7	18.3	19.3	3.0
Total	100.0	100.0	100.0	100.0	0.0

Source: ADePT Labor results, LFS 2003-2006 and Authors' calculations

17. **In fact, the reduction in the share of the labor force working in the agricultural sector (and also as unpaid family workers) in recent years, has gone hand in hand with the overall reduction of female labor force participation.** Overall employment in the agricultural sector has shrunk in Turkey from 2003 to 2006 by 5.3 percent per annum. The proportion of the labor force in agriculture is lower for men in 2003 (at around 23%) than for women (at 47%), therefore the reduction in the proportion of men in agriculture as a result of the shrinking employment in the sector is much less pronounced. The net outflow of women away from agriculture in this time period is about 563,000 women while the number for men in the same situation is about 400,000. The overall decline in female labor force participation in Turkey in this time period is 1.4% of the total working age population. The net outflow from agriculture is 3.2% of the total active female population while there are slight increases observed in the employment proportion of the other sectors (1.6% in services and 0.2% in manufacturing).

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[5]   According to the 9 code division of sectors, services sector cover wholesale retail trade, restaurants and hotels, transportation, communication and storage, financial intermediation, real estate, renting and business activities, public and government services, education, health and social work, community services.

[6]   It is also important to note here that given the cross-sectional nature of the datasets, it is only possible to speak about the net changes in employment across sectors rather than flows from one sector to the other.

The differences in the net flow by sector signals that the female workers leaving the agricultural sector have not been absorbed into other sectors in the same speed, therefore reducing the level of total participation in the overall working age group.

18. **Low female labor force participation is the case in urban areas more so than rural areas in Turkey.** Urban women at working age have lower labor participation rates (21.4%) than rural women (35.8%). By age groups, women in the 18-29 year age group in urban areas are the most active in the labor market with participation being still low at around 30%.[7] After that the participation of women in urban areas declines further (See Figure 2). It is also observed that the difference between the labor force participation of females in urban and rural areas becomes wider after the age of 29; and narrower after age of 60. In the same analysis, male labor force participation does not substantially differ across urban and rural for young men up to the age of 45, but falls sharply for urban men after that age.

Figure 2: Female Participation in the labor force is low particularly in urban areas
(Labor force participation rates by gender, age group and urban rural areas)

Data Source: Turkey Labor Force Survey 2006.
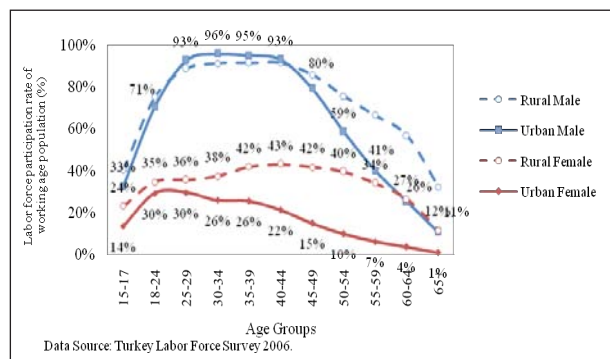
19. **Labor force participation, especially in urban areas, is strongly associated with levels of educational attainment of women and low labor force participation is more common among low-skilled urban women in Turkey.** The overall labor activity of women (between the

ages of 25-44) in urban areas who are illiterate or have not completed primary school is less than 9% while this level increases to 32% for those who have completed secondary school and to 80% for those who have completed university education. Those women in urban areas who are illiterate or have no formal schooling, also have the lowest levels of participation in the labor market. This may be a function of the jobs available for these women and the pay associated with these jobs. In this analysis it is only possible to say that in some economic or psychological way, the "opportunity cost" of working is higher for these low-skilled women than the returns they would receive in the labor market. This being said, it is also possible to say that, given that 73.7% of women in urban areas (above the age of 15) are low-skilled and mostly inactive, integrating these women into the labor market would significantly increase the current levels of female labor force participation.

20. **The participation issue related to high-skilled women in urban Turkey is one of early-exit from the labor market.** While the labor force participation rate of university educated women in urban areas is high around 80% between the ages of 25-44, this level is reduced in half (down to around 40%) for the 45-54 year old group.[8] We observe a certain decline in the participation levels of women who have only completed primary school or secondary school after age 45, but the decline in their participation levels is nowhere as steep as the one for women with tertiary degrees. For illiterate women with no schooling, overall levels of participation is low as mentioned previously, but these women actually stay in the labor market until a later age. This is likely to be a function of low social security coverage for this group, and their need to work under conditions of poverty rather than a desire to work in old age.

21. **In rural areas, education does not factor so much into labor force participation decisions.** There is less variation in rural areas in terms of levels of educational attainment among women, with 38% of women in rural areas having no diploma and 43% of women having only completed primary school.

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[7] The cross-sectional analysis presented here does not take into consideration the cohort effects that may be present. Cohort effects help assess changes in participation by age groups and allow tracking the successive cohorts. The labor participation trend of age groups shown in Figure-2 does not show the successive cohorts.

[8] Given that this analysis only makes use of cross-sectional data, it is not possible to comment here on cohort effects and whether younger generations of women are also going to be exhibiting early exit from the labor market. Changes to social security and pension law is expected to postpone the age of exit from the labor market of these high-skilled women in the future. In the current regime, still a women having served for 20 years would be entitled for pension.

These women, nevertheless, participate in the labor market in rural areas: in fact, 90% of the employment in the agricultural sector is by such women who have completed primary school or less. Thus, we can say that women with low levels of education are deterred from entering the labor market only in urban areas.

Figure 3: Female Labor Force Participation in Urban Areas by Level of Education and Age, 2006
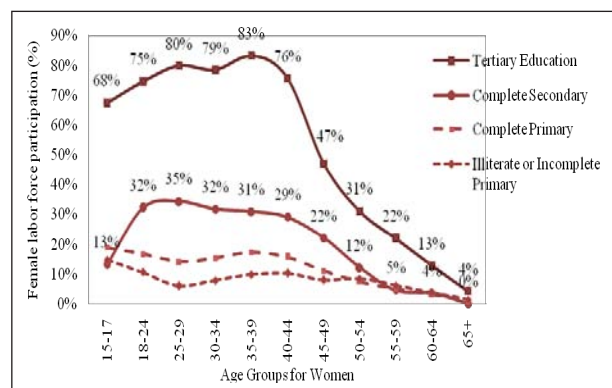
Source: LFS 2006, Authors' calculations

22. **For the male population, not having any formal education or having low levels of education is not a deterrent in entering the labor market both in urban and rural areas in Turkey.** In urban areas, in the 25-49 year old group, 74% of illiterate men with no schooling are active in the labor market, compared to 91% of primary school graduates and 94% and 95% of secondary school and university graduates respectively. The difference between the participation rates of men across different levels of educational attainment is certainly not as striking in urban areas as it is for women. Similar to women, however, men start exiting the labor market after age 45 and this fall is common across all educational groups.

23. **The levels of education for women closely follow the sectors of employment, with women in the agricultural sector having lower levels of education.** The average years of schooling for women working in the agricultural sector is only around five years and 1-in-3 women who work in the agricultural sector is either illiterate or has not completed primary school. In contrast, women working in the non-agricultural sector have higher levels of education. In fact, close to 70% of women in the non-agricultural sector hold secondary education (38%) or university degrees (30%). Women who hold university degrees make

up 16% of the employed population in the working age group of women, up from 13% in 2003, while this group constitutes only around 7% of the overall working age-population.

Table 4: Distribution of the Female Employed by Level of Education

	2003	2004	2005	2006	change
Education Level Completed					
Illiterate or Incomplete Primary	19.0	19.6	19.7	19.0	-0.0
Complete Primary	47.7	46.7	42.2	40.0	-7.7
Complete Secondary	19.9	21.0	23.4	24.8	4.9
Tertiary	13.4	12.6	14.8	16.2	2.8
Total	100.0	100.0	100.0	100.0	0.0
Level **of Education: Nonagricultural workers**					
Illiterate or Incomplete Primary	3.7	4.4	5.4	5.6	2.0
Complete Primary	27.0	29.7	27.3	25.7	-1.3
Complete Secondary	38.3	37.6	37.9	38.3	0.0
Tertiary	31.0	28.4	29.4	30.3	-0.7
Total	100.0	100.0	100.0	100.0	0.0
Level **of Education: Agricultural workers**					
Illiterate or Incomplete Primary	30.6	31.7	33.8	34.0	3.4
Complete Primary	63.2	60.2	57.0	56.0	-7.2
Complete Secondary	6.0	7.9	9.0	9.6	3.6
Tertiary	0.1	0.2	0.3	0.4	0.2
Total	100.0	100.0	100.0	100.0	0.0

Source: LFS 2003, 2004, 2005 and 2006

24. **There is a large gap in hourly earnings for low skilled men and women in Turkey, though this gap is not observable for highly skilled workers.** The hourly earnings for low-skilled men in urban areas is 1.4-1.5 times that of hourly mean earnings for women, while for high-skilled men and women in urban areas the difference in hourly wages is negligible (See Figure 4). In rural areas, the picture in terms of earnings for low-skilled women is not that different, where again there is a large wage differential between men and women in low-skilled jobs. As of 2006, a man in a low-skilled job in rural areas made 1.64 times the hourly wage of a woman in a similar job.[9]

25. **One reason for low female labor force participation of women in urban areas, may be the low earnings potential of available jobs for women with low skills.** Given that most women working in rural areas are already unpaid family workers, earnings circumstances in rural areas likely impact the decision to supply labor less than in urban areas. Another factor that needs to be

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[9]   It is important to note here that these comparisons are only crosstabs with cross-sectional data, and in order to measure proper gender disparities in earnings, one would need to use more detailed earnings equations, controlling for more factors.

considered is the opportunity cost of working in urban and rural areas. If in urban areas, the opportunity cost of working for women is high (with low availability of day-care options for children, and the inability to share responsibility with extended family on household chores), then it is likely that women whose earnings are low would choose to stay home rather than take low-paid jobs. In other words, the earnings potential for low-skilled women in urban areas might not be "high enough" in Turkey to justify them to leave home for work. These hypotheses would need to be analyzed further with qualitative data.

4. "Life Events" and Participation in the Labor Market

26. **In the DHS ever-married women sample, women who are currently not working (and who are between the ages of 20-65) overwhelmingly state "being a housewife" or taking care of children as being the main reason for not working.** Of the women in the working age group, who have ever been married, 58% state being a housewife as a reason for not working, while 9% state "taking care of children" as the reason for not working. Only 6% of those who are currently not working are looking for a job, hence indicating the low rate of "undesired" unemployment among women (See Table 5). For men in the same age group, the story is quite different: of the men in the

same age group who are currently not working, 32% "do not have a job and are looking for a job", 28% are "retired" and 12% are "handicapped/sick or too old to work".

27. **Running the same analysis for women in different categories, by urban and rural and by levels of educational attainment we get similar results.** Even among highly-skilled urban women (where highly-skilled is defined as holding a secondary school or university degree), we see that 59% of those who are currently not working report "being a housewife" or "taking care of children" as the reason for not working.

28. **This being said, the labor force participation of women in high-skilled and low-skilled groups responds differently to specific life events.** Figure 5 provides a rough chronology of events that take place in a woman's life starting from being single (never married), to being married with no children or pregnancies, to the first pregnancy and then the birth of respective children. The women in the sample are separated into urban high-skilled, urban low-skilled and rural groups and their probability of working is analyzed separately. Due to the cross-section nature of data, the analysis does not correct for cohort effects but provides a snap-shot picture of the current working status of women having experienced these life events.

Figure 4: Mean Hourly Real Wages (by gender skill-level and urban/rural)
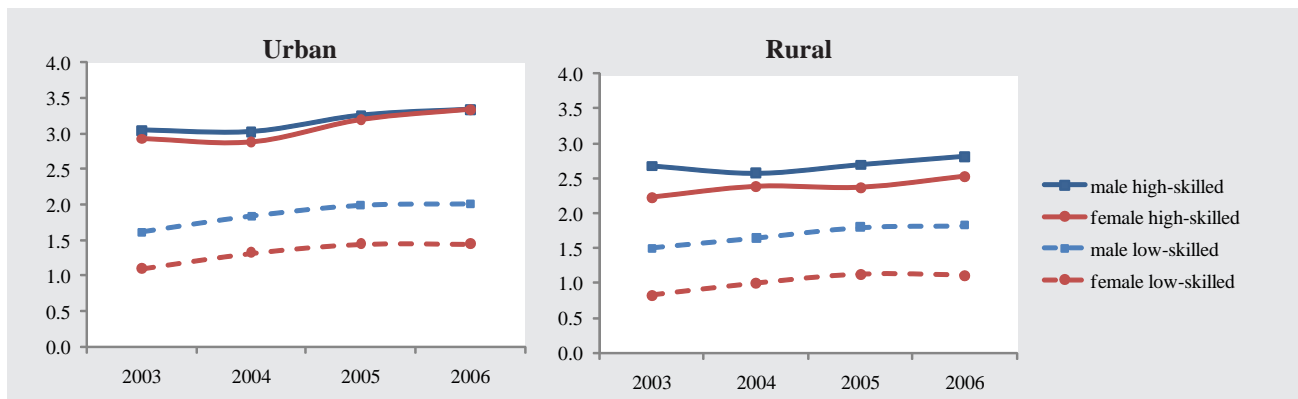
Source: Household Budget Survey, (2003-2006). In this analysis, high skilled is defined as having a secondary school diploma or higher.

29. **The probability of working for high-skilled women in urban areas increases until the birth of the first child, and then declines afterwards.** Whereas a highly-skilled woman in an urban area who has never been married before, works 43% of the time, a married woman in the same category works 54% of the time before her first pregnancy and 56% of the time during her first pregnancy. In other

words, marriage and the first pregnancy does not seem to be have a negative association with labor force participation of such women at the onset of their career and married life. What is interesting is that right after the birth of their first child, the likelihood of these highly-skilled women to be working drops by 15 percentage points down to 41% and does not recover again in consequent years (see Figure 5).

**Table 5: Main reasons for not working women in Turkey**

|	Rural		Urban		TOTAL
	Low skilled	High skilled	Low skilled	High skilled	
Housewife	67.9%	57.4%	56.8%	38.9%	57.4%
Looks after child	6.7%	12.2%	8.7%	19.6%	9.3%
Spouse/family does not want her to work	3.0%	12.7%	7.1%	7.2%	6.4%
Looking for a job	4.6%	5.5%	6.3%	10.7%	6.4%
Handicapped/sick/ too old	10.8%	0.0%	5.8%	1.5%	6.4%
Student	1.6%	2.9%	4.1%	2.4%	3.5%
Other	5.4%	9.3%	11.0%	19.7%	10.7%

Source: TDHS 2003

30. **On the other hand, for low-skilled women in urban areas the probability of participation is around 32% (for married women with no children) and declines significantly down to 15% during their first pregnancy.** Their participation rate never quite recovers from that level and only about 1 in 5 low-skilled women in urban areas with children continue to work. The situation is different in rural areas: while during their pregnancy, the women in rural areas also reduce their supply of labor (likely as a result of the nature of physical work required in agriculture), but then recovers after the birth of the first child (See again Figure 5). The existence of children in rural areas does not hinder women from continuing to work around the family farm or within the village. This result, which is also supported by the multivariate analysis in the next section, may be a function of the availability of care by other women and relatives in the extended households in rural areas.

31. The subcategory of women who worked before marriage, but quit working afterwards is an interesting category for analysis given that there is a large change in labor force participation following marriage. The DHS survey has a question targeting particularly these women, and asking for their reasons for quitting work after they got married. In urban areas, the women who quit working after marriage list "having moved or migrated" as one of the top reasons for having stopped working. Another important reason quoted for quitting work after marriage in urban areas, is that the husband's family does not allow the woman to work. About a third of women report quitting after marriage

as a result of migration, and another third report their husband's family not approving of their work participation as the main reason for quitting. In rural areas, the number of women who quit work are much less significant than in urban areas, yet in rural areas these two reasons for quitting work after marriage also prevail.

Figure 5: Chronology of life events and the probability of working for women (for women ages 20-65)[10]
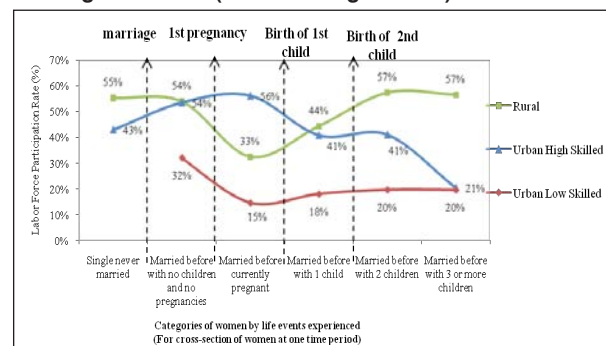
Source data: Turkey DHS 2003

Figure 6: Labor Force Participation for women by migration status and educational attainment (for women ages 20-45 only)
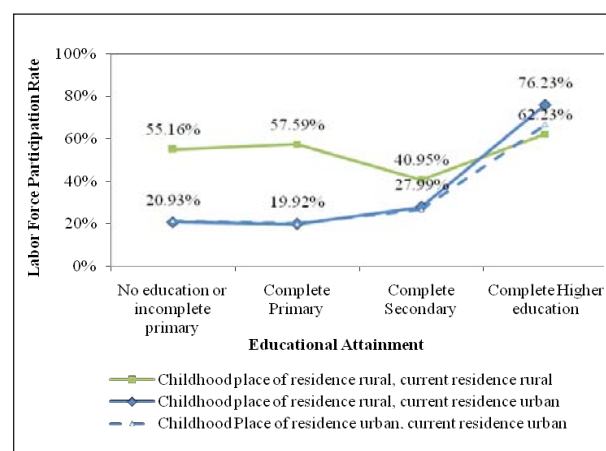
Source data: TDHS 2003

32. **While migration[11] seems to be an important reason that hinders women's labor force participation, the negative association between migration from rural areas and labor force participation disappears when controlling for educational attainment of women.** The DHS data allows us to look at the birth place of a woman and her current place of residence. Figure 6, provides information on labor force participation of 3 different

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[10]   There are no observations in the data set for urban low skilled never-married women, hence the analysis of urban low skilled women does not include this category.

[11]   For more on the effects of migration please see Dayioglu and Kirdar (2009), Ozden mimo. (2008) and Angel-Urdinola (2009).

categories of women according to their migration status from rural to urban areas: (i) those who were born in rural areas and are currently still living in rural areas, (ii) those who were born in rural areas but are currently living in urban areas, (ii) those born in urban areas and are currently living in urban areas.[12] The women who were born in rural areas and stayed there (denoted by the green line) have relatively higher labor force participation when compared to the other groups of women in all education categories except for higher education. Women in urban areas, whether they were born in rural areas or urban areas before have very similar levels of labor force participation – at around 20% for women with primary school degree or less and around 28% for women with secondary school degrees. Women who were born in rural areas but moved to urban areas later, and who hold a university degree, interestingly have higher labor force participation than women with same educational classifications but were born in urban areas.[13] Therefore, one can say that migration status to urban areas is not associated with lower labor force participation for women, when education levels are controlled for. This statement is also confirmed in the next section when we control for more characteristics of these women in the multivariate analysis.

5.   Multivariate Analysis on the Probability of Working for Women

33. **The multivariate analysis provided in this section looks at the correlates of female labor force participation in Turkey.** The analysis is run twice for two different dependent variables: the analysis in Table 6 panel A takes the probability of "working" for a woman as the dependent variable and runs a probit model for the probability of this variable going from 0 to 1. The definition of working is given by the combination of the variables in DHS that ask "whether the woman has worked in the past month" or "if she usually works". In Table 6 Panel B the dependent variable is the probability of participating in the labor force, defined in the same way as the dependent variable for working but also adding those who are currently looking for a job as participating in the labor force. Thus, the dependent variable in the probit regressions in Table 6 Panel B is defined as: "having worked in the

last month" or "usually working" or "currently looking for a job". The results of the two probit regressions are very similar and the explanation below is provided for Panel A.

34. All explanatory variables in the regression are expressed as dummy variables and the coefficients reported in the regression represent the change in the probability of working (dF/dx) for a discrete change of the explanatory variables from 0 to 1. The sample in this model comes from the ever-married women questionnaire in TDHS 2003 data. This survey has a sample of 8,075 ever-married women at age 15-49. The multivariate analysis is carried out for 3 different sub-samples of the survey and the whole sample separately. The results are presented in Table 6 Panel A and B in the following 4 columns: Column (1) reports results for highly skilled women in urban areas, column (2) for low skilled women in urban areas, Column (3) for women in rural areas and Column (4) for all women in the sample.   The explanatory variables in the probit analysis can be categorized as (i) background variables (such as place of birth, mother tongue spoken at first home and current place of residence), (ii) education variables for the woman and her husband, (iii) wealth status of household derived from the household assets index and (iv) household composition, pregnancy status and number of children in household (v) cultural and social proxies for traditional family values. The results are presented as follows:

35. **Urban/Rural Place of Residence:** The urban/rural divide in terms of female labor force participation is quite strongly pronounced again in the multivariate analysis controlling for other characteristics. In the overall sample, the probability of a woman working is lower by 31% in urban areas when compared with rural areas.

36. **Birth region:** The provinces in Turkey are divided into 3 major regions for this analysis East, Central and West (the Mediterranean and the Black Sea regions are included in the Central part of the country). The category that is dropped from the regression is Eastern Turkey and the other two regions are compared to this region. In the overall sample, the women born in Eastern provinces have the lowest likelihood of

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[12]   In this analysis, we did not look at women born in urban areas and are currently living in rural areas as this was a very small subgroup in the sample.

[13]   Note that this may be due to selection: for women who come out of rural areas and choose to go to university may also be more interested to pursue a career.

working. Those who were born in central provinces are 5% more likely, and those who were born in western provinces are 10% more likely to have worked in the past month when compared to women born in eastern provinces (controlling for all other factors such as education level). This being said, in rural areas, and among women in urban areas with high skills, the birth region does   not make a difference in the probability of working controlling for all else.

37. **Urban/Rural Place of Birth:** In the overall sample, controlling for current place of residence, urban or rural place of birth does not make a difference in the probability of working for women. Surprisingly, for urban highly skilled women, coming from a rural background is even associated with an increase in the probability of working by about 10%. This is an interesting finding that even more strongly confirms the statement made in Figure 6 where controlling for education levels, migration to urban areas is not associated with a decline in women's labor force participation.

38. **Mother Tongue:** The mother tongue variable is setup as a dummy variable that takes on the value of 1 if Turkish was the primary language spoken in the woman's first household. This variable takes on no significant value in these regressions in any of the sub-categories or in the overall sample.

39. **Own education:** The education variables are defined in 4 categories in this analysis. The first category is "being illiterate or having no diploma from primary school". This category is dropped out of the regression and all other categories are compared to this lowest level of education. In the overall sample, having a primary school degree (5 years of education) is not associated with higher probability of working, while having a secondary school degree is associated with a 11%, and having a university degree is associated with a 48% increase in the probability of working when compared to women with no diploma. In urban areas, among high skilled women (which only includes the secondary school and university graduates), having a university degree is associated with a 32% increase in the probability of working. In rural areas, a primary school degree is associated with a 6.4% increase in the probability of working when compared to a woman in rural areas with no diploma. A university degree in rural areas is also associated with a very high increase in probability of working (around 36%). Although the group of women in rural areas with university degrees

is a very small percentage of the total sample, the coefficient is still statistically significant. From this analysis, it is possible to conclude that while a higher education degree is associated with a strong jump in the probability of working, lower levels of education and even a secondary school degree, does not increase the likelihood of working for a woman in Turkey when compared to the group with no formal education.

40. **Husband's education:** The husband's level of education in Turkey, is associated with a decline in the probability of working for women in the overall sample, this association is particularly strong in the sample of women in urban areas who are low-skilled. For high-skilled women in urban areas, their husband's level of education is not a significant factor. For these women, only their own level of education matters in the probability of participating in the labor force. For rural women, once again, the husband's education does not take on a statistically significant coefficient. However, for urban low-skilled women, the probability of working is lower, the higher the level of education of the husband. This result implies that in urban areas when the education level of the husband increases (and perhaps he is able to maintain a certain standard of living for the family) the woman's probability of working decreases if she has a low level of education. This finding is also consistent with the coefficients on the wealth index which we discuss next.

41. **Wealth quintile:** The wealth quintiles in the analysis are constructed using the Filmer-Pritchett asset index in the DHS survey. The asset index is already constructed in raw DHS dataset using the durable goods in the household and certain household characteristics. The poorest quintile in this set-up is Wealth Quintile 1 and this is the category that is dropped from the regression. In the overall sample, increased wealth quintiles is associated with lower levels of female labor force participation. A woman in the highest wealth quintile in terms of the assets index, is 13.1% less likely to be working as a woman in the lowest quintile. This is a counter-intuitive finding from an economic point of view, because normally one would expect that in households where women work, the income level and therefore the wealth quintile might also be higher. In spite of such a potential positive relationship between the two variables, wealth in Turkey seems to consistently be associated with lower levels of female labor force participation, rather than higher levels. In a sense,

women who live in households where the husband's education level is higher, and where the wealth index is higher, can afford not to work. This phenomenon is observed more strongly among low-skilled women in urban areas while for highly skilled women in urban areas (as well as among rural women in top quintiles), wealth level is not associated with higher (or lower) probability of working.

Table 6a: Multivariate Analysis on the probability of working for women
Dependent variable: Probability of Working in the last month or usually working

Dependent variable:	Working or Usually Working			
VARIABLES	(1) Urban High Skilled	(2) Urban Low Skilled	(3) Rural	(4) TOTAL
Age	0.0858***	0.0362***	0.0326***	0.0449***
	(0.0189)	(0.00634)	(0.0110)	(0.00581)
Age Squared	-0.00129***	-0.000525***	-0.000363**	-0.000622***
	(0.000276)	(0.0001)	(0.000164)	(0.0001)
Urban				-0.313***
				(0.0149)
Birth Region: Central	0.0911	0.0408*	0.00674	0.0491**
	(0.0601)	(0.0237)	(0.0846)	(0.0241)
Birth Region: West	0.0815	0.0939***	0.0313	0.0998***
	(0.0585)	(0.0284)	(0.0845)	(0.0263)
Place of childhood residence is a village	0.0978**	-0.0110	0.120***	0.0152
	(0.0493)	(0.0130)	(0.0359)	(0.0134)
Current Region: Central	-0.0566	0.0633**	-0.0291	0.0248
	(0.0609)	(0.0258)	(0.0828)	(0.0245)
Current Region: West	-0.0819	0.00374	-0.0747	-0.0311
	(0.0567)	(0.0234)	(0.0807)	(0.0232)
Mother Tongue of woman is Turkish	0.0140	0.0120	0.0546	0.0226
	(0.0785)	(0.0198)	(0.0403)	(0.0190)
Own Education (complete primary)		0.00745	0.0636**	0.0154
		(0.0173)	(0.0310)	(0.0167)
Own Education (complete secondary)	-0.319***		0.00813	0.107***
	(0.0329)		(0.0749)	(0.0288)
Own Education (complete higher education)			0.356***	0.481***
			(0.0437)	(0.0273)
Husband's Education (complete primary)	-0.161	-0.0596**	0.0402	-0.0307
	(0.275)	(0.0241)	(0.0382)	(0.0220)
Husband's Education (complete secondary)	-0.199	-0.0701***	-0.0695	-0.0841***
	(0.282)	(0.0240)	(0.0532)	(0.0245)
Husband's Education (complete higher education)	-0.126	-0.112***	-0.0870	-0.0622**
	(0.302)	(0.0242)	(0.0804)	(0.0288)
Currently Pregnant	-0.0534	-0.0676***	-0.110***	-0.0784***
	(0.0614)	(0.0253)	(0.0420)	(0.0219)
Number of Children Under 5 = 1	-0.0643*	-0.0825***	-0.0139	-0.0620***
	(0.0359)	(0.0139)	(0.0289)	(0.0135)
Number of Children Under 5 = 2	-0.120**	-0.0848***	-0.0170	-0.0750***
	(0.0606)	(0.0177)	(0.0365)	(0.0181)
Number of Children Under 5 = 3 or more		-0.0724***	-0.0813*	-0.0901***
		(0.0266)	(0.0458)	(0.0248)
Number of additional women (other than the one interviewed in HH) above age 20	-0.0177	0.0343***	0.0462***	0.0375***
	(0.0261)	(0.00847)	(0.0126)	(0.00730)
Wealth Quintile 2	-0.0663	-0.0719***	-0.0433	-0.0690***
	(0.187)	(0.0195)	(0.0310)	(0.0181)
Wealth Quintile 3	-0.0991	-0.0815***	-0.0179	-0.0780***
	(0.173)	(0.0198)	(0.0354)	(0.0188)
Wealth Quintile 4	-0.109	-0.0897***	-0.0813**	-0.105***
	(0.173)	(0.0202)	(0.0384)	(0.0189)
Wealth Quintile 5	-0.0499	-0.131***	-0.156***	-0.131***
	(0.183)	(0.0190)	(0.0520)	(0.0207)
Marriage was arranged by the family (s268_1 ==2)	-0.0661*	-0.0334**	0.0865***	-0.00708
	(0.0374)	(0.0132)	(0.0236)	(0.0121)
Brides money was paid by groom's family in first marriage	0.140	0.0143	0.0173	0.0228
	(0.130)	(0.0176)	(0.0272)	(0.0160)
Woman has a male dominant view of the world *	-0.0526	0.0160	0.0711***	0.0209*
	(0.0383)	(0.0129)	(0.0273)	(0.0125)
Observations	1177	4658	2084	7924

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6b: Multivariate Analysis on the probability of labor force participation for women
Dependent variable: Probability of Working in the last month or usually working or currently looking for a job

Dependent variable:	Labor Force Participation			
	(1)	**(2)**	**(3)**	**(4)**
VARIABLES	Urban High Skilled	Urban Low Skilled	Rural	TOTAL
Age	0.0995***	0.0381***	0.0350***	0.0480***
	(0.0189)	(0.00660)	(0.0110)	(0.00590)
Age Squared	-0.00153***	-0.000567***	-0.000409**	-0.000683***
	(0.000278)	(0.0001)	(0.000163)	(0.0001)
Urban				-0.296***
				(0.0149)
Birth Region: Central	0.0413	0.0443*	-0.000166	0.0433*
	(0.0605)	(0.0247)	(0.0839)	(0.0243)
Birth Region: West	0.0384	0.0998***	0.0251	0.0933***
	(0.0592)	(0.0292)	(0.0840)	(0.0263)
Place of childhood residence is a village	0.0823*	-0.0271**	0.111***	-0.00191
	(0.0490)	(0.0136)	(0.0359)	(0.0137)
Current Region: Central	-0.0329	0.0864***	-0.0170	0.0443*
	(0.0625)	(0.0270)	(0.0821)	(0.0249)
Current Region: West	-0.0820	0.0150	-0.0745	-0.0228
	(0.0579)	(0.0246)	(0.0803)	(0.0236)
Mother Tongue of woman is Turkish	-0.00844	0.0165	0.0495	0.0240
	(0.0781)	(0.0208)	(0.0401)	(0.0193)
Own Education (complete primary)		-0.00246	0.0631**	0.00759
		(0.0184)	(0.0309)	(0.0171)
Own Education (complete secondary)			0.0309	0.141***
			(0.0725)	(0.0286)
Own Education (complete higher education)	0.306***		0.360***	0.486***
	(0.0329)		(0.0365)	(0.0247)
Husband's Education (complete primary)	0.0773	-0.0685***	0.0365	-0.0353
	(0.282)	(0.0253)	(0.0381)	(0.0225)
Husband's Education (complete secondary)	0.0410	-0.0829***	-0.0732	-0.0940***
	(0.284)	(0.0252)	(0.0531)	(0.0252)
Husband's Education (complete higher education)	0.127	-0.137***	-0.0977	-0.0764***
	(0.281)	(0.0248)	(0.0803)	(0.0294)
Currently Pregnant	-0.0585	-0.0876***	-0.114***	-0.0922***
	(0.0632)	(0.0259)	(0.0419)	(0.0224)
Number of Children Under 5 = 1	-0.119***	-0.104***	-0.0256	-0.0875***
	(0.0364)	(0.0145)	(0.0288)	(0.0137)
Number of Children Under 5 = 2	-0.141**	-0.114***	-0.0279	-0.104***
	(0.0626)	(0.0178)	(0.0364)	(0.0182)
Number of Children Under 5 = 3 or more		-0.112***	-0.0948**	-0.128***
		(0.0255)	(0.0458)	(0.0245)
Number of additional women (other than the one interviewed in HH) above age 20	-0.00684	0.0382***	0.0428***	0.0395***
	(0.0262)	(0.00893)	(0.0125)	(0.00749)
Wealth Quintile 2	-0.0632	-0.0866***	-0.0587*	-0.0859***
	(0.192)	(0.0205)	(0.0310)	(0.0186)
Wealth Quintile 3	-0.0847	-0.0969***	-0.0320	-0.0909***
	(0.181)	(0.0208)	(0.0354)	(0.0194)
Wealth Quintile 4	-0.152	-0.119***	-0.0900**	-0.134***
	(0.174)	(0.0208)	(0.0385)	(0.0192)
Wealth Quintile 5	-0.101	-0.165***	-0.169***	-0.168***
	(0.180)	(0.0193)	(0.0520)	(0.0209)
Marriage was arranged by the family (s268_1 ==2)	-0.102***	-0.0406***	0.0841***	-0.0161
	(0.0377)	(0.0139)	(0.0235)	(0.0123)
Brides money was paid by groom's family in first marriage	0.164	0.00869	0.0128	0.0172
	(0.120)	(0.0183)	(0.0271)	(0.0163)
Woman has a male dominant view of the world *	-0.0565	0.0105	0.0739***	0.0166
	(0.0387)	(0.0136)	(0.0272)	(0.0127)
Observations	1179	4658	2084	7926

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

42. **Pregnancy and child birth:** In the overall sample, pregnancy and child birth are associated with lower probabilities of working for women in Turkey: a woman who is currently pregnant is 8% less likely to be working controlling for all else, and a woman with 1 child below the age of 5 is 6% less likely to be working compared to a married woman with no children. For highly skilled women in urban areas, pregnancy does not take on a statistically significant coefficient in terms of the probability of working although the birth of the first child is associated with a lower probability of working by 6%. For low skilled women in urban areas, however, both pregnancy and having children below the age of 5 are associated with lower levels of participation. For low skilled women in urban areas, having 1 child is associated with a reduction in probability of working by 8% compared to having no children. The additional children after that one child, do not make a difference in the probability of working for low skilled urban women. This can be contrasted with the situation of rural women: while the labor force participation is lower during pregnancy for rural women (likely to be as a result of the physical work they are involved in), after they give birth their probability of working does not change, when compared to women with no children. Only if rural women have 3 or more children under the age of five, then their probability of working is lower than a woman with no children in rural areas. We have also tested the correlation between having an additional woman in the household (above the age of 20 and who could act as a care-taker of children) and labor force participation and found that having such a person in the household is associated with a 4% increase in the probability of working in the overall sample.

43. **Cultural and social variables:** The DHS dataset allows for the analysis of certain cultural/social proxies for traditional values at the household level. These variables were added to the analysis to inform the debate around the cultural versus economic reasons for female labor force participation in Turkey. There are three variables used in this analysis to signal for traditional values in the household: (i) the marriage was arranged by the families, (ii) "brides money" *(başlık parası)* was paid during the wedding (from the groom's family to the bride's family) and (iii) the woman has a male-dominant view of the world.[14] These traditional-value system proxies do not take on any significant coefficient in the overall sample. In the urban and rural sub-samples these variables take on different signs: If the marriage of the woman was arranged by her family, then this is associated with a 7% decline in her probability of working in urban areas, while it is associated with an 8% increase in probability of working in rural areas. The payment of bride's money during the wedding does not take on a statistically significant coefficient in any of the sub-samples or in the overall sample. In general, it is possible to say that cultural variables that signal more traditional values for the household are associated with higher participation levels for women in rural areas and lower participation levels for urban areas, controlling for all other characteristics.

6. Conclusion

44. This paper has been motivated by the low and declining levels of female labor force participation in Turkey. Women's labor force participation levels have come down from 48% in 1980 down to its current levels at around 26% in 2006. The levels of participation is Turkey are now lower than in all OECD countries, and lower even than many countries in the Middle East (such as Iran, Pakistan, Syria, Libya and Kuwait) that historically have had low female participation rates.

45. The decline in labor force participation has continued in the period analyzed in this paper 2003-2006, with declining levels of employment of women as unpaid family workers in the agricultural sector. The reduction in the number of women in the agricultural sector has not been absorbed by other sectors in the economy. The low-skilled women who leave the agricultural sector, it seems, are unable (or unwilling) to find jobs in urban areas thus driving down the level of female labor force participation in urban areas. When controlling for education levels, migration from rural to urban areas is not associated with a decline in labor force participation of women. However, urban migration from rural areas is associated with a significant decline in the labor force participation for low-skilled women. Given that low skilled women

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[14] Male dominant view of the world is a variable that combines information from the following three questions. If the woman has answered "yes" to any of the following then she is classified as having a male-dominant view: (i) important decisions should be taken by men (ii) men are wiser than women (iii) women should not argue with men (iv) male child should get more education. These questions are found in section s767 of the DHS 2003 survey for Turkey.

make up 74% of the working age population of urban women (and 80% of the working population of all women) in Turkey, increasing the activity level of these women in the labor market is important for raising the overall levels of participation for women. Although early-exit is more widely observed among high skilled women, especially for university graduates, their overall participation rates are high and low female labor force participation is an issue among low skilled women in urban areas more so than in other groups.

46. Four findings in this paper analysis are key for understanding the incentives that face low-skilled women in urban areas and that determine the supply and demand for their labor: (i) There is a large gap in earnings for low skilled men and women in Turkey both in urban and rural areas, which may be reducing the incentives for urban low-skilled women to participate in the labor market (ii) In the absence of affordable childcare, urban low-skilled women face a high opportunity cost for working not justified by their low wage levels outside the home. For high skilled women in urban areas, and for rural women the number of children do not play as significant a role in the probability of working. (iii) As the wealth status of the household and the education level of the husband increases, low-skilled women in urban areas are more likely to not be working, indicating that if they can afford it these women may actually prefer to stay at home than to work. (iv) The cultural/social proxies for traditional family values are associated with a decline in the labor force participation of urban women, more so than rural women in the sample.

47. The combination of these supply and demand side factors are currently negatively correlated with the labor force participation decisions of urban low-skilled women in Turkey. There is a certain degree of preferences and cultural values that seem to play into these decisions, but this is only a small part of the picture as the multivariate analysis also suggests. The high opportunity cost of 'home production' (for instance in the form of high child-care fees) and the low wage level compared to men in the labor market for these urban women may explain the more dominant economic reasons for their low participation level. Further qualitative analysis would be useful in disentangling the impact that each of these supply and demand factors variables have on the decision-making process of low-skilled women in urban areas.

Annex - Tables

Table A-1: Hierarchical Decomposition of the Total Labor Force (Hierarchical rates)

	2003	2004	2005	2006	change
Total population	100.0	100.0	100.0	100.0	0.0
1.1 Working age population (15-64 years of age)	73.3	73.4	73.4	73.6	0.3
1.1.1 Inactive	48.9	48.5	48.7	48.9	0.0
1.1.1.1 Discouraged	1.6	5.5	7.5	8.9	7.3
1.1.2 Active	51.1	51.5	51.3	51.1	-0.0
1.1.2.1 Employed	89.2	89.4	89.5	89.9	0.7
1.1.2.2 Unemployed	10.8	10.6	10.5	10.1	-0.7

Note: Changes shown between years 2003 and 2006
Source: LFS 2003, 2004, 2005 and 2006

Table A-2: Hierarchical Decomposition of the Female Labor Force (Hierarchical rates)

	2003	2004	2005	2006	change
Total population	100.0	100.0	100.0	100.0	0.0
1.1 Working age population (15-64 years of age)	73.1	73.1	73.2	73.4	0.3
1.1.1 Inactive	71.9	73.0	73.5	73.3	1.5
1.1.1.1 Discouraged	0.8	3.5	5.3	6.3	5.5
1.1.2 Active	28.1	27.0	26.5	26.7	-1.5
1.1.2.1 Employed	89.5	90.0	89.4	89.4	-0.1
1.1.2.2 Unemployed	10.5	10.0	10.6	10.6	0.1

Table A-3: Hierarchical Decomposition of the Male Labor Force (Hierarchical rates)

	2003	2004	2005	2006	change
Total population	100.0	100.0	100.0	100.0	0.0
1.1 Working age population (15-64 years of age)	73.4	73.7	73.7	73.8	0.4
1.1.1 Inactive	26.0	23.9	23.8	24.5	-1.5
1.1.1.1 Discouraged	3.6	11.4	14.1	16.7	13.0
1.1.2 Active	74.0	76.1	76.2	75.5	1.5
1.1.2.1 Employed	89.0	89.2	89.5	90.1	1.1
1.1.2.2 Unemployed	11.0	10.8	10.5	9.9	-1.1

Note: Changes shown between years 2003 and 2006
Source: LFS 2003, 2004, 2005 and 2006

Table A-4: Employment Categories, Shares in Total Employment

Work Status	2003	2004	2005	2006	Change
Registered regular employee	35.7	34.6	37.2	38.9	3.2
Unregistered regular employee	8.3	9.3	11.1	11.6	3.3
Registered casual employee	0.7	0.7	0.6	0.7	0.1
Unregistered casual employee	7.3	7.8	6.8	6.6	0.7
Registered Employer	4.1	3.6	3.8	4.0	0.1
Unregistered Employer	0.9	1.0	1.2	1.3	0.5
Registered self-employed	8.4	8.4	8.5	8.2	0.3
Unregistered self-employed	15.0	15.0	14.9	14.2	0.8
Unpaid family worker	19.4	19.7	15.9	14.5	-4.9

Source: LFS 2003, 2004, 2005 and 2006

Table A-5: Employment Categories, Shares in Male Employment

Work Status	2003	2004	2005	2006	Change
Registered regular employee	38.9	37.4	39.8	41.4	2.5
Unregistered regular employee	9.2	9.8	11.6	12.0	2.9
Registered casual employee	0.9	0.9	0.7	0.8	-0.1
Unregistered casual employee	8.0	8.4	7.2	7.1	-0.9
Registered Employer	5.5	4.7	5.0	5.1	-0.4
Unregistered Employer	1.2	1.3	1.5	1.7	0.5
Registered self-employed	11.2	11.1	11.1	10.6	-0.7
Unregistered self-employed	16.7	17.2	15.9	15.2	-1.6
Unpaid family worker	8.4	9.1	7.2	6.1	-2.3

Source: LFS 2003, 2004, 2005 and 2006

Table A-6: Distribution of the Male Employed by Economic Sector

Sector of Activity (1-9)	2003	2004	2005	2006	Change
Agriculture, forestry and fishing	22.6	23.9	20.1	18.3	-4.3
Mining	0.5	0.7	0.7	0.8	0.2
Manufacturing	19.6	19.4	20.4	20.8	1.2
Electricity, gas and water supply	0.6	0.5	0.5	0.5	-0.1
Construction	6.3	6.4	7.2	7.6	1.3
Services	50.3	49.2	51.1	52.0	1.7
*Wholesale retail trade, restaurants and hotels	23.9	23.3	24.7	24.9	1.0
*Transportation, communication and storage	6.4	6.6	6.7	6.7	0.3
*Financial intermediation, real estate, renting and business activities	3.6	3.6	4.0	4.5	0.9
*Public and Government services, education, health and social work,	16.3	15.6	15.8	15.9	-0.5
Total	100.0	100.0	100.0	100.0	0.0

Source: LFS 2003, 2004, 2005 and 2006

Table A-7: Distribution of Male Employed by Level of Education

	2003	2004	2005	2006	change
Education Level Completed					
Illiterate	2.2	2.5	1.9	1.8	0.5
No Schooling	1.9	2.9	3.1	3.1	1.2
Primary School	49.9	49.0	45.5	44.0	5.9
Basic or Junior Secondary School	13.8	14.3	15.7	16.4	2.5
Senior Secondary School (including vocational)	21.6	21.5	23.0	23.3	1.7
Higher education	10.6	9.8	10.8	11.5	0.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**0.0**
Level of Education: Non-agricultural workers					
Illiterate	1.1	1.2	1.0	1.0	-0.1
No Schooling	1.1	1.8	2.2	2.3	1.2
Primary School	43.3	43.4	40.9	39.8	-3.6
Basic or Junior Secondary School	15.3	15.6	16.5	17.0	1.7
Senior Secondary School (including vocational)	25.7	25.4	26.2	26.2	0.5
Higher education	13.5	12.6	13.2	13.7	0.2
Total	**100.0**	**100.0**	**100.0**	**100.0**	**0.0**
Level of Education: Agricultural workers					
Illiterate	6.2	6.5	5.4	5.1	-1.1
No Schooling	4.5	6.4	6.6	6.7	2.2
Primary School	72.4	67.1	63.7	62.8	-9.6
Basic or Junior Secondary School	8.9	10.3	12.8	13.6	4.7
Senior Secondary School (including vocational)	7.3	8.8	10.2	10.3	2.9
Higher education	0.7	1.0	1.4	1.5	0.8
Total	**100.0**	**100.0**	**100.0**	**100.0**	**0.0**

Note: Changes shown between years 2003 and 2006
Source: LFS 2003, 2004, 2005 and 2006

Annex-1

Definition of Input Variables

(i) **Age:** Given that this variable was categorical instead required as continuous, a continuous age variable was randomly created. Then, was fitted into the program successfully.

(ii) **Gender:** It was defined as a dummy variable, 1=Male and 0=Female

(iii) **Level of education:** Two different sets of categories were defined under education levels. In most cases, 4 levels of education are used: "Illiterate or Incomplete Primary", "Complete Primary", "Complete Secondary", "Tertiary". The other set of 6 categories are: "Illiterate", "No Schooling", "Primary School", "Basic or Junior Secondary School", "Senior Secondary Schooling (including vocational)", "Higher Education".

Education Levels

	TURKSTAT definitions		Categories defined in this paper			
0	Age less than 6 or illiterate	1	Illiterate	1	Illiterate or incomplete primary	
1	Literate but no schooling	2	No schooling			
2	Primary school	3	Primary school	2	Complete primary	
3	Junior secondary, vocational junior secondary and primary education	4	Basic or Junior Secondary School	3	Complete secondary	
4	General High school	5	Senior Secondary School (including vocational)			
5	Vocational High school					
6	Vocational Tertiary School, faculty and above	6	Higher Education	4	Tertiary	

(iv) **Employment variables:** Definition for employment variables was based on TURKSTAT's definitions but limited for population at working-age (15-64) instead of age 15 and over. TURKSTAT's definitions[15] related to labor force statistics are noted below:

a. Labour force: Comprises all employed persons and all unemployed.

b. Labour force participation rate: Indicates the ratio of the labour force to non-institutional working age population.

c. Persons employed: Comprises all the noninstitutional working age population who are included in the "persons at work" and "not at work" described below.

d. Persons at work: Persons economically active during the reference period for at least one hour as a regular employee, casual employee, employer, self employed or unpaid family worker.

e. Employment rate: Employment rate is the ratio of employed persons to the non-institutional working age (15-64) population.

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[15] TURKSTAT (2007) Household Labor Force Statistics 2006, pp.XXIV

f. Persons unemployed: The unemployed comprises all persons at working age who were not employed (neither worked for profit, payment in kind or family gain at any job even for one hour, who have no job attachment) during the reference period who have used at least one channels for seeking a job during the last three months and were available to start work within two weeks.

Persons who have already found a job and will start to work within 3 months, or established his/her own job but were waiting to complete necessary documents to start work were also considered to be unemployed if they were available to start work within two weeks.

g. Unemployment rate: Is the ratio of unemployed persons to the labor force.

h. Employment status: All persons who are currently employed and persons employed in the past are classified according to International Classification on Status in Employment (ICSE,1993):

    i. Regular employee

    ii. Casual employee

    iii. Employer

    iv. Self employed

    v. Unpaid family worker

(v) **Earnings:** It was defined as "monthly net income in cash".

(vi) **Work Category:** According to TURKSTAT's categorization; except unpaid family workers, regular employees (Wage/salary workers), casual employees, employer and self-employed categories were decomposed as "registered" and "unregistered" in order to identify informality in profile analyses.

(vii) **Sector of economic activity:** For main activity coding, TURKSTAT's classification of 9 sector

codes were used. (1) Agriculture, forestry and fishing (2) Mining (3) Manufacturing (4) Electricity, gas and water supply (5) Construction (6) Wholesale retail trade, restaurants and hotels (7) Transportation, communication and storage (8) Financial intermediation, real estate, renting and business activities (9) Public and Government services, education, health and social work, community Services.

(viii) **Region:** SRE-1 Level identification was used. Regional identifiers were only available for the years 2004, 2005 and 2006.

SRE-1 Classification	
1	Istanbul
2	West Marmara
3	Aegean
4	East Marmara
5	Western Anatolia
6	Mediterranean
7	Central Anatolia
8	Western Black Sea
9	Eastern Black Sea
10	Northeastern Anatolia
11	Middle eastern Anatolia
12	Southeastern Anatolia

(ix) **Hours:** Number of hours worked in a week was set as 45.

(x) **Informality:** In this paper, informality refers to those who are not registered within the social security system.

(xi) **Discouraged:** The definition from TURKSTAT is used, which refers persons who are available to start a job but are not seeking because of not knowing where to search a job because of not knowing where to search or who believe no job is available for him/her in the region.

Annex-2: International Labor Organization (ILO) Definitions[16]

The Economically Active Population comprises all persons of either sex who furnish the supply of labor for the production of goods and services during a specified time-reference period. According to the 1993 version of the System of National Accounts, production includes all individual or collective goods or services that are supplied to units other than their producers, or intended to be so supplied, including the production of goods or services used up in the process of producing such goods or services; the production of all goods that are retained by their producers for their own final use; the production of housing services by owner-occupiers and of domestic and personal services produced by employing paid domestic staff.

Two useful measures of the economically active population are the usually active population measured in relation to a long reference period such as a year, and the currently active population, or, equivalently, the labor force measured in relation to a short reference period such as one day or one week.

Employment is defined as follows in the Resolution concerning statistics of the economically active population, employment, unemployment and underemployment, adopted by the Thirteenth International Conference of Labor Statisticians (Geneva, 1982):

(1) The "**employed**" comprise all persons above a specific age who during a specified brief period, either one week or one day, were in the following categories:

(a) "Paid employment":

(a1) "At work": persons who during the reference period performed some work for wage or salary, in cash or in kind;

(a2) "With a job but not at work": persons who, having already worked in their present job, were temporarily not at work during the reference period and had a formal attachment to their job. This formal job attachment should be determined in the light of national circumstances, according to one or more of the following criteria: (i) The continued receipt of wage or salary; (ii) An assurance of return to work following the end of the contingency, or an agreement as to the date of return; (iii) The elapsed duration of absence from the job which, wherever relevant, may be that duration for which workers can receive compensation benefits withoutobligations to accept other jobs?

(b) "Self-employment":

(b1) "At work": persons who during the reference period performed some work for profit or family gain, in cash or in kind;

(b2) "With an enterprise but not at work": persons with an enterprise, which may be a business enterprise, a farm or a service undertaking, who were temporarily not at work during the reference period for any specific reason.

(2) For operational purposes, the notion "some work" may be interpreted as work for at least one hour.

(3) Persons temporarily not at work because of illness or injury, holiday or vacation, strike or lockout, educational or training leave, maternity or parental leave, reduction in economic activity, temporary disorganization or suspension of work due to such reasons as bad weather, mechanical or electrical breakdown, or shortage of raw materials or fuels, or other temporary absence with or without leave should be considered as in paid employment provided they had a formal job attachment.

(4) Employers, own-account workers and members of producers' cooperatives should be considered as in self-employment and classified as "at work" or "not at work", as the case may be.

(5) Unpaid family workers at work should be considered as in self-employment irrespective of the number of hours worked during the reference period. Countries that prefer for special reasons to set a minimum time criterion for the inclusion of unpaid family workers among the employed should identify and separately

[16]   World Bank Poverty Reduction Group, Automated labor market diagnostics for low and middle income countries: ADePT Labor User Guide http://siteresources.worldbank.org/INTPOVRES/Resources/ADePT Labor Guide.pdf, pp.50

classify those who worked less than the prescribed time.

(6) Persons engaged in the production of economic goods and services for own and household consumption should be considered as in self-employment if such production comprises an important contribution to the total consumption of the household.

(7) Apprentices who received pay in cash or in kind should be considered in paid employment and classified as "at work" or "not at work" on the same basis as other persons in paid employment.

(8) Students, homemakers and others mainly engaged in non-economic activities during the reference period, who at the same time were in paid employment or self-employment as defined in subparagraph (1) above should be considered as employed on the same basis as other categories of employed persons and be identified separately, where possible.

(9) Members of the armed forces should be included among persons in paid employment. The armed forces should include both the regular and temporary members as specified in the most recent revision of the International Standard Classification of Occupations (ISCO).

Unemployment is defined as follows in the Resolution concerning statistics of the economically active population, employment, unemployment and underemployment, adopted by the Thirteenth International Conference of Labor Statisticians (Geneva, 1982):

(1) The "unemployed" comprise all persons above a specified age who during the reference period were:

(a) "Without work", i.e. were not in paid employment or self-employment

(b) "Currently available for work", i.e. were available for paid employment or self-employment during the reference period; and

(c) "Seeking work", i.e. had taken specific steps in a specified reference period to seek paid employment or self-employment. The specific steps may include registration at a public or private employment exchange; application to employers; checking at worksites, farms, factory gates, market or other assembly places;

placing or answering newspaper advertisements; seeking assistance of friends or relatives; looking for land, building, machinery or equipment to establish own enterprise; arranging for financial resources; applying for permits and licenses, etc.

(2) In situations where the conventional means of seeking work are of limited relevance, where the labor market is largely unorganized or of limited scope, where labor absorption is, at the time, inadequate, or where the labor force is largely self-employed, the standard definition of unemployment given in subparagraph (1) above may be applied by relaxing the criterion of seeking work.

(3) In the application of the criterion of current availability for work, especially in situations covered by subparagraph (2) above, appropriate tests should be developed to suit national circumstances. Such tests may be based on notions such as present desire for work and previous work experience, willingness to take up work for wage or salary on locally prevailing terms, or readiness to undertake self-employment activity given the necessary resources and facilities.

(4) Notwithstanding the criterion of seeking work embodied in the standard definition of unemployment, persons without work and currently available for work that had made arrangements to take up paid employment or undertake self-employment activity at a date subsequent to the reference period should be considered as unemployed.

(5) Persons temporarily absent from their jobs with no formal job attachment that were currently available for work and seeking work should also be regarded as unemployed in accordance with the standard definition of unemployment. Countries may, however, depending on national circumstances and policies, prefer to relax the seeking work criterion in the case of persons temporarily laid off. In such cases, persons temporarily laid off who were not seeking work but classified as unemployed should be identified as a separate subcategory.

(6) Students, homemakers and others mainly engaged in non-economic activities during the reference period that satisfy the criteria laid down in subparagraphs (1) and (2) above should be regarded as unemployed on the same basis as other categories of unemployed identified separately, where possible.

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