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Labor-Force Participation of Married Women in Turkey: A Study of the Added-Worker Effect and the Discouraged-Worker Effect

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ABSTRACT: We analyze married women's labor-supply responses to their husbands' job loss (added-worker effect) and worsening of unemployment conditions (discouraged-worker effect). We construct six two-year pseudopanel panels based on the previous year's labor market outcomes using nationally representative Turkish Household Labor Force Surveys from 2005 to 2010. We find that women whose husbands involuntarily transition from employment to unemployment are more likely to participate in the labor force. We pool the six-year pseudopanel panels and examine the effects of aggregate employment conditions on wives' transition to the labor force. A worsening of unemployment conditions has a small discouraging effect on wives' labor-supply responses.

KEY WORDS: added worker effect, female labor force participation, Turkey

Models of family labor supply show that unemployment of one spouse should increase the labor-supply response of the other spouse (Ashenfelter 1980).¹ This has been called the added-worker effect (AWE), where a married woman responds to the unemployment of her husband by increasing her labor supply. Empirical analyses of private arrangements in response to unemployment shocks have potential to inform policy debates on the design of public unemployment insurance programs.² Lundberg (1985) argues that while additional labor-force participants may appear in families whose employed members have experienced job loss, a general worsening of employment opportunities may result in discouraged workers who drop out of the labor force or refrain from entering it in anticipation of a costly job search, lower wages, or poor working conditions. This is called the discouraged-worker effect (DWE). Understanding the DWE is important in the design of labor market programs during recessionary periods.

Analysis of female labor supply response to idiosyncratic and aggregate shocks will also have implications for gender equality in the labor market. Greater equality between men and women is associated with poverty reduction, higher schooling rates for children, higher gross domestic product, and better governance (Klasen 2002; Mourao 2013; King and Mason 2001). Female labor-force participation rate (FLFPR), as an instrument for increased rights and better economic conditions for women, can play an important role in achieving these development goals. FLFPR in Turkey, a middle-income emerging country, is 32 percent, significantly lower than the Organisation for Economic Co-operation and Development (OECD) average of 62 percent but above the Middle East and North African (MENA) average of 25 percent.

We contribute to the literature on the labor-force participation (LFP) of women in three important ways. First, there is little analysis of the AWE within the context of an emerging economy with limited publicly provided unemployment insurance. We contribute to this sparse literature by examining the existence of the AWE in Turkey using the nationally representative yearly cross-sectional Turkish Household Labor Force Survey (HLFS) data for the 2005–10 period. We construct six two-year

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pseudopanel data sets using retrospective questions on the previous year's labor market outcomes and examine the wife's transition probability from inactivity to activity in response to the husband's job loss. To our knowledge, this is the first article to test the presence of an added-worker effect using pseudopanel data in Turkey. Many empirical studies in the literature use cross-sectional data and compare the LFP rates of married women whose husbands are unemployed with those whose husbands are employed. There might be unobserved heterogeneity between these two groups, which might result in biased regression coefficients. In our study, we estimate the AWE for the same couples, where the husband may or may not have experienced an unemployment shock.

Second, recessions and fluctuations in unemployment rates are fairly common in emerging economies, and how households respond to these external events is of great interest to policy makers. We test for the discouraged-worker effect by pooling the six two-year pseudopanel data and examine how changes in regional unemployment conditions affect transition of married women from inactivity to activity. To our knowledge, ours is the first article that analyzes the existence of the AWE and the DWE in one longitudinal study.

Third, we examine the effects of the husband's underemployment status on the wife's labor-force participation decision. In our data, a person is underemployed if he or she is involuntarily working less than forty hours a week. Similar to involuntary job loss, it is a labor market outcome where a person would have liked to work more. While there are studies on the effects of underemployment in developed countries, this phenomenon has not been previously studied in an emerging economy. Since we only observe the husband's underemployment status in the current year, we analyze the effect of this variable on the wife's LFP in pooled yearly cross-sectional data of employed husbands for the 2005–10 period controlling for a rich set of sociodemographic factors for husband and wife and regional unemployment conditions.

The empirical studies on developed countries find little evidence supporting the AWE and attribute this to availability of generous publicly provided unemployment insurance programs (Cullen and Gruber 2000; Lundberg 1985; Maloney 1986, 1991; Prieto-Rodriguez and Rodriguez-Gutiérrez 2003; Spletzer 1997). Kohara (2010) and Stephens (2002) are the two exceptions, in which the AWE is found to be significant and important using panel data from Japan and the United States, respectively. The few studies from emerging economies and developing countries present mixed results. Fernandes and De Felicio (2005) find that the AWE is highly significant in metropolitan areas of Brazil, a middle-income developing country, using a monthly employment survey of six metropolitan areas for the years 1985, 1993, and 1999. In contrast, Semeels (2002) finds that AWE is not significant in Ethiopia—a low-income developing country. Semeels (2002) concludes that households try other ways to deal with unemployment, such as consumption smoothing or selling assets.³ In another study, Cerutti (2000) find that AWE is significant in Buenos Aires, Argentina, a developing country, using the Household Continuous Survey for years 1991–95. The authors argue that increasing unemployment and economic uncertainty due to structural adjustment policies have led to growth in FLFPR. Skoufias and Parker (2006) find that husbands' involuntary job losses due to the 1995 Mexican peso crisis increased LFP of wives. In contrast, Cho and Newhouse (2013), using repeated cross-sectional household data, find only a mild AWE of the great recession on FLFPR for seventeen middle-income countries.⁴

In a static model of household labor supply, the AWE can occur for two reasons: the husband's unemployment reduces household income (the income effect), and the husband's time replaces the wife's time in household activities (the substitution effect).

If there are perfect capital markets, in a life-cycle context, the wife's labor-supply decision will take into account the present value of family wealth over the lifetime and not only current family income (Heckman and Macurdy 1980). Hence in developed countries, one reason for small or insignificant empirical findings for the AWE could be the absence of liquidity constraints.⁵ It is well established that market opportunities for dealing with unemployment risk, whether through unemployment insurance or through credit, are less well developed in lower-income countries (Besley 1995). Hence, the AWE might be more relevant in the context of developing countries.

In Turkey, prior studies on this topic are Baslevant and Onaran (2003) and Tansel (2002). Using Population Census results from 1980, 1985, and 1990, Tansel analyzes the effects of unemployment

rate and gross domestic product (GDP) per capita on aggregate LFP rates of women. She finds that unemployment rate has a negative effect on participation rates at the province level. Baslevant and Onaran use the Turkish HLFS data for the years 1988 and 1994 and find that in the economic crisis year of 1994, the added-worker effect is dominant. Both studies use cross-sectional analysis methods.

In this article, we find evidence for a statistically significant added-worker effect in Turkey for years 2005–10. Husband's involuntary job loss increases wife's transition probability from inactivity to activity by about four percentage points. We find that a worsening of overall economic conditions measured by regional unemployment rates has a small negative effect on wives' transition probability from inactivity to activity. One percentage point increase in the regional unemployment rate decreases the transition probability of a wife from inactivity to activity by 0.005 percentage points. We also find that husband's underemployment status has a negative effect on wife's LFP. Husband's underemployment status is associated with an increase of seven percentage points in wife's LFP probability.

Setting: Female Labor-Force Participation in Turkey

FLFPR in Turkey decreased from 36 percent in 1988 to 25 percent in 2004 and has slowly increased since then, to 32 percent in 2012 (Organisation for Economic Co-operation and Development 2012).⁶ Turkey also has the lowest FLFPR among the Central Asian countries. Among countries with large Muslim populations however, Turkey's FLFPR is not an outlier; Egypt, Pakistan, and Tunisia display similar levels.

Interestingly, FLFPR in Turkey was much higher thirty years ago. In 1980, FLFPR was about 48 percent, a rate comparable to rates in countries such as Australia, Austria, the Netherlands, and Switzerland at that time. Since the mid-1950s, rapid migration from rural areas to urban centers has been continually transforming women who were employed in the farming sector as unpaid family workers into city dwellers who are recorded as housewives in surveys. The share of the population that lived in urban areas was 29 percent in 1955, 44 percent in 1980, 59 percent in 1990, and 65 percent in 2000.

During the 1988–2000 period, LFP rates for urban women (both married and single) remains pretty stagnant around 15 percent while that of rural women appears to decline from 50 percent to 40 percent (Ozer and Bicerli 2003). The decrease in LFP rates in rural areas might be the result of the aging population as young people migrate to urban areas while the old stay behind.

However, since massive migration from rural to urban areas in Turkey did not result in lower LFP rates for men with comparable education and experience levels, the women's traditional role as childcare providers is a potential culprit in explaining reduced labor-force participation rates for women.

According to TURKSTAT statistics, the LFP of urban married women is stagnant around 13 percent during 1988–99. In our data, we observe a steady increase in labor-force participation of urban married women during the 2005–10 period, from 16 percent to 26 percent.

Turkey is an emerging economy whose average GDP growth rate during 2005–8 was a remarkable 5.18 percent. However, as an emerging economy, it is also vulnerable to economic downturns. Our period of study is also marked with the 2008 global financial crisis, as a result of which Turkey entered into a recession in 2009 where GDP decreased by 4.8 percent and the unemployment rate reached an all-time high of 16.1 percent.⁷ As shown in Table 1, the percentage of husbands who involuntarily lost jobs increased from 4 percent to 6 percent in 2009. Our research question focuses on urban married women's labor-force participation response to husband's job loss (idiosyncratic shock to the household) and a worsening of aggregate conditions (aggregate shock to households). Since idiosyncratic shocks to households are more likely to occur during sharp downturns in emerging markets, our results also provide insight on labor market responses of households during recessions.

Data and Methodology

We use nationally representative, yearly cross-sectional Turkish Household Labor Force Survey (HLFS) data for the 2005–10 period, made available by TURKSTAT. To examine wives' labor-

Table 1. Descriptive statistics of two-year pseudopanel

	2005		2006		2007		2008		2009		2010	
	T	U	T	U	T	U	T	U	T	U	T	U
Wife transitioned into labor force (proportion)	0.07 (0.26)	0.03 (0.18)	0.08 (0.28)	0.04 (0.19)	0.08 (0.27)	0.04 (0.20)	0.08 (0.27)	0.04 (0.20)	0.09 (0.29)	0.05 (0.23)	0.09 (0.29)	0.07 (0.25)
Age of husband	37.45 (7.65)	38.67 (7.67)	37.77 (8.14)	38.70 (7.74)	38.22 (7.55)	38.71 (7.70)	38.29 (7.72)	38.84 (7.69)	38.09 (7.83)	39.04 (7.66)	38.64 (7.65)	39.29 (7.71)
Age of wife	33.66 (7.86)	34.87 (7.96)	34.41 (8.24)	34.88 (8.05)	34.69 (7.83)	34.97 (8.00)	34.87 (8.14)	35.16 (7.97)	34.47 (8.24)	35.28 (7.98)	34.99 (8.01)	35.58 (8.01)
Children (aged 0-4)	0.49 (0.65)	0.45 (0.63)	0.43 (0.62)	0.45 (0.64)	0.49 (0.68)	0.45 (0.63)	0.49 (0.68)	0.45 (0.64)	0.53 (0.69)	0.46 (0.65)	0.50 (0.68)	0.46 (0.64)
Children (aged 5-11)	0.86 (0.89)	0.77 (0.87)	0.74 (0.84)	0.76 (0.87)	0.82 (0.90)	0.74 (0.85)	0.83 (0.87)	0.72 (0.84)	0.74 (0.89)	0.70 (0.83)	0.75 (0.86)	0.70 (0.81)
Children (aged 12-14)	0.30 (0.57)	0.30 (0.54)	0.28 (0.55)	0.28 (0.52)	0.32 (0.58)	0.28 (0.52)	0.31 (0.56)	0.28 (0.52)	0.28 (0.53)	0.29 (0.52)	0.31 (0.54)	0.29 (0.52)
Husband's education variables												
Less than primary school	0.02 (0.17)	0.02 (0.14)	0.02 (0.16)	0.02 (0.14)	0.03 (0.18)	0.01 (0.13)	0.04 (0.19)	0.01 (0.12)	0.03 (0.18)	0.01 (0.13)	0.05 (0.22)	0.02 (0.16)
Primary school graduate	0.63 (0.48)	0.46 (0.49)	0.63 (0.48)	0.46 (0.49)	0.59 (0.49)	0.45 (0.49)	0.62 (0.48)	0.45 (0.49)	0.59 (0.49)	0.44 (0.49)	0.60 (0.48)	0.44 (0.49)
Middle school graduate	0.14 (0.34)	0.14 (0.34)	0.14 (0.35)	0.14 (0.34)	0.14 (0.35)	0.14 (0.34)	0.14 (0.34)	0.14 (0.35)	0.15 (0.36)	0.14 (0.35)	0.16 (0.36)	0.14 (0.35)
High school graduate	0.14 (0.34)	0.24 (0.42)	0.15 (0.35)	0.24 (0.43)	0.18 (0.38)	0.25 (0.43)	0.14 (0.35)	0.24 (0.43)	0.16 (0.37)	0.25 (0.43)	0.16 (0.37)	0.24 (0.43)
College graduate	0.03 (0.17)	0.11 (0.31)	0.02 (0.16)	0.11 (0.32)	0.02 (0.14)	0.12 (0.32)	0.03 (0.17)	0.12 (0.33)	0.03 (0.18)	0.13 (0.33)	0.02 (0.14)	0.13 (0.34)
Wife's education variables												
Less than primary school	0.05 (0.23)	0.04 (0.20)	0.06 (0.24)	0.04 (0.20)	0.08 (0.27)	0.04 (0.20)	0.08 (0.27)	0.05 (0.21)	0.09 (0.28)	0.05 (0.22)	0.24 (0.42)	0.13 (0.33)
Primary school graduate	0.62 (0.48)	0.58 (0.49)	0.64 (0.47)	0.57 (0.49)	0.59 (0.49)	0.57 (0.49)	0.57 (0.49)	0.56 (0.49)	0.56 (0.49)	0.54 (0.49)	0.55 (0.49)	0.54 (0.49)
Middle school graduate	0.07 (0.25)	0.08 (0.27)	0.08 (0.27)	0.08 (0.28)	0.07 (0.25)	0.09 (0.28)	0.08 (0.28)	0.09 (0.29)	0.09 (0.29)	0.10 (0.30)	0.08 (0.28)	0.10 (0.30)

High school graduate	0.08 (0.28)	0.15 (0.36)	0.08 (0.28)	0.15 (0.36)	0.11 (0.31)	0.16 (0.37)	0.10 (0.31)	0.16 (0.37)	0.11 (0.32)	0.17 (0.38)	0.09 (0.29)	0.17 (0.37)
College graduate	0.01 (0.13)	0.02 (0.16)	0.01 (0.11)	0.03 (0.17)	0.01 (0.11)	0.03 (0.17)	0.01 (0.13)	0.03 (0.18)	0.01 (0.13)	0.03 (0.19)	0.01 (0.11)	0.03 (0.19)
Number of other adults	0.08 (0.36)	0.08 (0.34)	0.12 (0.43)	0.09 (0.36)	0.11 (0.47)	0.08 (0.36)	0.10 (0.41)	0.08 (0.35)	0.11 (0.43)	0.09 (0.40)	0.11 (0.40)	0.07 (0.31)
Number of observations	1,073	32,837	998	32,901	1,123	32,815	1,315	31,915	1,982	31,034	1,434	32,473
Regional variables												
Regional unemployment rate	0.10 (0.04)		0.10 (0.04)		0.10 (0.04)		0.11 (0.04)		0.13 (0.04)		0.11 (0.03)	
Rate of change in regional unemployment rate	0.04 (0.27)		0.00 (0.20)		0.06 (0.18)		0.09 (0.19)		0.23 (0.19)		-0.13 (0.18)	

Notes: T: husband transitioned from employment to unemployment; U: husband remained employed.

participation decisions, we select urban households in which both husband and wife are between the ages of twenty and fifty-four years and the husband is in the labor force. We exclude households in which husband or wife is employed in the agriculture sector or enrolled in education.

According to the International Labor Organization definition, a person is in the labor force if he or she is employed or is not employed but looking for work. We use this definition to construct the wife's LFP variable. In the HLFS, a person is asked whether he or she has worked in the reference week for pay or as an unpaid family worker. If the person has not worked in the reference week, he or she is further asked whether he has looked for work in the reference week and the reason for unemployment. We consider a husband as involuntarily unemployed if he was fired or laid off and currently looking for work. Involuntary job loss is an important reason for job loss in the HLFS data, and it is about three times more likely to occur than a voluntary quit.

We use HLFS data in two ways. First, we construct two-year pseudopanel data based on survey questions for the labor market outcomes of the previous year and the current year. In each year's survey, there are retrospective questions on a couple's labor market outcome for the previous year. This allows us to construct six two-year pseudopanel data where husband's and wife's labor market outcomes are observed. Following the methodology in Fernandes and De Felicio (2005), we select couples where husband is employed and wife is not in the labor force in the previous year. Husband's involuntary transition from employment to involuntary unemployment in the current year is the treatment variable. The treatment group includes the households where the husband loses his job involuntarily in the current year, whereas the control group (untreated group) includes the households where the husband remains employed in the current year. The participation decision can be modeled as the following probability model:

$$\Pr(P_{it} = 1) = \Phi(\beta_0 + \beta_1 S_{it} + X'_{it} \beta_2), \quad (1)$$

where $P_{it} = 1$ if the wife of the i th couple joins the labor force in year t ; or $P_{it} = 0$ if she remains out of the labor force. Φ is the standard normal cumulative distribution function; S_{it} is husband's involuntary job loss indicator and equals one if husband transitions (involuntarily) from employment to unemployment or zero if husband continues to be employed in year t . Many empirical studies use cross-sectional data and compare the LFP rates of married women whose husbands are unemployed with those whose husbands are employed. There might be unobserved heterogeneity between these two groups, which might result in biased regression coefficients. In our study, we estimate the AWE for the same couples, where the husband may or may not have experienced an unemployment shock. Hence the problem of unobserved heterogeneity across couples does not bias our estimates. Furthermore, instead of using an overall unemployment indicator for the husband, we define the unemployment shock as job loss due to a layoff or a firing. Since a choice-based unemployment status such as a husband's quitting his job is likely to be endogenous to the labor-force participation decision of the wife, using an overall unemployment indicator would result in biased coefficients. An involuntary job loss that results from a layoff or a firing is less likely to be prone to such a problem.⁸

The vector X includes demographic characteristics similar to those used in Fernandes and De Felicio (2005). These are age of wife (husband), dummy variables for education levels completed by wife (husband), and variables for the number of children in the household aged zero to four, five to eleven, and twelve to fourteen and for the number of adults (other than wife or husband) in the household that do not work. In Turkey, extended-family members may live in the household and help take care of the children. This might be a factor that influences the wife's labor-force participation. After estimating Equation (1) using robust standard errors, we estimate average marginal effects for the whole sample and average marginal effects for the treated sample.

Second, we pool the six pseudopanel data for 2005–10 to examine the effects of changes in regional employment conditions on wives' labor-force participation decision. In the data, Turkey is divided into twenty-six regions. As a result, we are able to include the regional GDP per capita (in

million Turkish lira [TL] and available only for 2001) and rate of change in regional unemployment rate to measure the effects of employment conditions on female labor-force participation.

We then estimate the following probability model:

$$\Pr(P_{it}) = \Phi(\beta_0 + \beta_1 S_{it} + X'_{it}\beta_3 + \beta_4 G_j + \beta_5 M_{jt}), \quad (2)$$

where P_{it} , S_{it} , and the vector X are defined as before. In this estimation, we are still restricting the sample to observations where the husband is employed and the wife is out of labor force in the previous year. Hence our dependent variable is wife's transition probability from inactivity to activity.

In our econometric model, G_j is the GDP per capita in region j in year 2001, since this variable is available only for this year; M_{jt} is the rate of change in regional unemployment rate in region j in year t measured as unemployment rate in year t minus unemployment rate in year $t-1$ divided by unemployment rate in $t-1$. GDP per capita and regional unemployment rates are the frequently used variables to measure the level of economic development and overall economic conditions, respectively. Our objective is to estimate how the wife's transition probability from inactivity to activity is affected by the husband's involuntary job loss (AWE) and a worsening of unemployment conditions (DWE) simultaneously using this longitudinal setup.⁹

While we observe the labor market status of husband and wife in both previous and current year, we only observe husband's underemployment status in the current period. Hence we cannot analyze the effect of the husband's underemployment on the wife's participation by constructing pseudopanel data. Instead, we use pooled yearly cross-sectional data of employed husbands for 2005–10. We then test whether wives whose husbands are underemployed are more likely to participate in the labor market.¹⁰

Results

Descriptive Statistics

Table 1 presents the descriptive statistics for variables used in two-year pseudopanel estimations. \underline{U} (untreated) indicates the sample where the husband remains employed; T (treated) indicates the sample where the husband transitions from employment to unemployment involuntarily. As shown in Table 1, the percentage of wives that transitions from inactivity to activity (join the labor force) is higher in the treated sample (where the husband loses his job) than it is in the untreated sample in each of the six two-year pseudopanel data sets. Tests on the equality of proportions show that the proportion of wives that join the labor force in the treated sample is indeed significantly higher than it is in the untreated sample.

It is interesting to note that the share of primary school graduate husbands is higher in the treated sample than in the untreated sample while shares of high school and college graduates are higher in the untreated sample than in the treated sample, indicating higher unemployment risk for workers with low levels of education. Wives' education levels for the two samples follow a similar pattern. These observations suggest that couples with lower levels of education are more vulnerable to unemployment shocks.

Is There an Added-Worker Effect?

In this section, we present our two-year pseudopanel results. In these regressions, the sample is composed of couples where the husband is employed and the wife is not in the labor force in the previous year. The dependent variable (husband's transition variable) is equal to one if the husband is fired or laid off in the current year and zero if he remains employed. We estimate probit regressions for six two-year pseudopanel data sets where we examine how a change in the husband's employment status from employed to unemployed affects the wife's transition probability from inactivity to activity in each year.

Table 2 presents coefficients of the probit estimations with robust standard errors, and Table 3 presents average marginal effects. Average marginal effects are computed for all of the observations in the whole sample (E) and also for the observations in the treated sample, where husband has

Table 2. Probability of wife's transition from inactivity to activity: Probit model coefficients

	2005	2006	2007	2008	2009	2010
Husband's transition	0.40*** (0.06)	0.43*** (0.05)	0.42*** (0.05)	0.36*** (0.05)	0.34*** (0.04)	0.18*** (0.04)
Age of husband	0.05*** (0.02)	0.06*** (0.02)	-0.02 (0.02)	0.07*** (0.02)	0.03* (0.01)	0.06*** (0.01)
Age of husband squared/100	-0.09*** (0.03)	-0.09*** (0.02)	0.01 (0.02)	-0.11*** (0.02)	-0.05** (0.02)	-0.09*** (0.02)
Age of wife	0.10*** (0.02)	0.06*** (0.01)	0.12*** (0.02)	0.07*** (0.01)	0.10*** (0.01)	0.10*** (0.02)
Age of wife squared/100	-0.17*** (0.03)	-0.12*** (0.02)	-0.21*** (0.02)	-0.14*** (0.02)	-0.16*** (0.02)	-0.05*** (0.02)
Children (aged 0-4)	-0.33*** (0.02)	-0.37*** (0.02)	-0.36*** (0.02)	-0.36*** (0.02)	-0.37*** (0.02)	-0.29*** (0.02)
Children (aged 5-11)	-0.13*** (0.01)	-0.11*** (0.01)	-0.14*** (0.01)	-0.17*** (0.01)	-0.17*** (0.01)	-0.12*** (0.01)
Children (aged 12-14)	-0.02 (0.02)	-0.004 (0.02)	0.004 (0.02)	-0.03 (0.02)	-0.02 (0.02)	0.008 (0.02)
Husband's education variables						
Primary school graduate	-0.18** (0.09)	-0.13** (0.09)	0.04 (0.11)	-0.14 (0.09)	0.04 (0.09)	-0.008 (0.07)
Middle school graduate	-0.20** (0.09)	-0.20** (0.10)	0.07 (0.11)	-0.15 (0.10)	0.03 (0.10)	-0.09 (0.07)
High school graduate	-0.29*** (0.09)	-0.21** (0.10)	-0.09 (0.11)	-0.21** (0.09)	-0.06 (0.09)	-0.16*** (0.07)
College graduate	-0.43*** (0.10)	-0.33*** (0.10)	-0.18 (0.11)	-0.38*** (0.10)	-0.22** (0.10)	-0.45*** (0.07)
Wife's education variables						
Primary school graduate	0.11*** (0.05)	0.28*** (0.05)	0.21*** (0.05)	0.23*** (0.05)	0.28*** (0.05)	0.17*** (0.03)
Middle school graduate	0.33*** (0.06)	0.42*** (0.06)	0.36*** (0.06)	0.38*** (0.06)	0.37*** (0.06)	0.14*** (0.04)
High school graduate	0.48*** (0.06)	0.56*** (0.06)	0.56*** (0.06)	0.58*** (0.06)	0.60*** (0.05)	0.30*** (0.04)

College graduate	1.10*** (0.07)	1.20*** (0.07)	1.23*** (0.07)	1.23*** (0.07)	1.23*** (0.07)	1.31*** (0.06)	0.83*** (0.06)
Number of other adults	-0.04 (0.03)	-0.07** (0.03)	-0.09** (0.03)	-0.11*** (0.03)	-0.11*** (0.03)	0.04* (0.02)	-0.03 (0.03)
Number of observations	33910	33899	33938	33230	33230	33016	33907
Pseudo- R^2	0.07	0.07	0.08	0.07	0.07	0.07	0.03
Log-likelihood	-4,920	-5,437	-5,572	-5,849	-5,849	-6,868	-8,603

Notes: Robust standard errors are in parentheses. *Significant at the 10 percent level; **significant at the 5 percent level; ***significant at 1 percent level.

Table 3. Probability of wife's transition from inactivity to activity: Marginal effects

	2005		2006		2007		2008		2009		2010	
	E	T	E	T	E	T	E	T	E	T	E	T
Husband's Transition	0.041**	0.041**	0.049**	0.049**	0.049**	0.047**	0.043**	0.041**	0.046**	0.044**	0.027**	0.027**
Age of husband	0.004*	0.007*	0.005**	0.009**	-0.001	-0.003	0.007**	0.01**	0.003	0.005	0.008**	0.01**
Age of husband squared/100	-0.006**	-0.01**	-0.007**	-0.01**	0.001	0.002	-0.01**	-0.01*	-0.005*	-0.008*	-0.01**	-0.01**
Age of wife	0.007**	0.01**	0.005**	0.01**	0.01**	0.01**	0.007**	0.01**	0.01**	0.01**	0.003	0.004
Age of wife squared/100	-0.01**	-0.02**	-0.01**	-0.01**	-0.01**	-0.03**	-0.01**	-0.02**	-0.01**	-0.02**	-0.006**	-0.008**
Children (aged 0-4)	-0.02**	-0.04**	-0.03**	-0.05**	-0.03**	-0.05**	-0.03**	-0.05**	-0.04**	-0.06*	-0.03**	-0.04**
Children (aged 5-11)	-0.009**	-0.01**	-0.009**	-0.01**	-0.01**	-0.02**	-0.01**	-0.02**	-0.01**	-0.02*	-0.01**	-0.02**
Children (aged 12-14)	-0.001	-0.003	-0.0003	-0.0006	0.0003	0.0006	-0.003	-0.004	-0.002	-0.003	0.001	0.001
Husband's education variables												
Primary school graduate	-0.01*	-0.02*	-0.01	-0.02	0.003	0.006	-0.01	-0.02	0.004	0.006	-0.001	-0.001
Middle school graduate	-0.01**	-0.02*	-0.01*	-0.02*	0.006	0.01	-0.01	-0.02	0.004	0.006	-0.01	-0.01
High school graduate	-0.02**	-0.03**	-0.01*	-0.02*	-0.008	-0.01	-0.01*	-0.02	-0.007	-0.01	-0.02**	-0.02**
College graduate	-0.02**	-0.04**	-0.02**	-0.04**	-0.01	-0.02	-0.02**	-0.04**	-0.02**	-0.03	-0.04**	-0.05**
Wife's education variables												
Primary school graduate	0.008*	0.01*	0.02**	0.04**	0.01**	0.03**	0.02**	0.03**	0.03**	0.04**	0.02**	0.02**
Middle school graduate	0.03**	0.05**	0.04**	0.08**	0.03**	0.06**	0.04**	0.06**	0.05**	0.07**	0.02**	0.02**
High school graduate	0.04**	0.08**	0.06**	0.11**	0.06**	0.10**	0.07**	0.11**	0.08**	0.12**	0.04**	0.05**
College graduate	0.18**	0.27**	0.22**	0.32**	0.23**	0.32**	0.24**	0.32**	0.29**	0.37**	0.18**	0.21**
Number of other adults	-0.0003	-0.0005	-0.006*	-0.01*	-0.008**	-0.01**	-0.01**	-0.01**	0.004	0.007	-0.004	-0.05**
Number of observations	33,910	33,910	33,899	33,899	33,938	33,938	33,230	33,230	33,016	33,016	33,907	33,907

Notes: E: Average treatment effects (ATE); T: Average treatment effects on the treated (ATT). *Significant at the 5 percent level; **significant at 1 percent level.

experienced involuntary job loss (T). Hence column E presents average treatment effect (ATE), and column T presents average treatment effect on the treated (ATT).

We find that our variable of interest, husband's transition variable, has a positive and statistically significant coefficient for each of the six probit estimations, indicating the existence of AWE in each year. From Table 3, we observe that AWE for the whole sample is about four to five percentage points in years 2005–9, and it is 2.7 percent in 2010 (column E). These estimates are higher than in Spletzer (1997), which finds an AWE of 2 percent (not statistically significant) for the United States, but lower than in Fernandes and De Felicio (2005) and Skoufias and Parker (2006), which find AWE of about 7 percent and 13.8 percent, respectively.

Note that 2009 was a recession year in Turkey following the 2008 global financial crisis. The unemployment rate reached an all-time high of 16.1 percent in 2009, which is during our period of analysis. The percentage of husbands who involuntarily lost jobs increased from 4 percent in 2008 to 6 percent in 2009. It is interesting to observe that the AWE remains high and significant at 4.6 percent in this recession year. Hence, although the unemployment rate peaked in 2009, the AWE dominated any possible discouraged-worker effect for wives whose husbands lost their jobs.

In Table 3, the AWE for the treated sample has values similar to those for the AWE for the whole sample. This suggests that the treatment (husband's job loss) is randomized across individuals, consistent with our assumption that unobservable disturbances would have been the same with or without treatment.¹¹

The results on demographic variables are consistent with expectations. We observe that wife's transition presents a standard inverted U shape for age variable. Educated wives are more likely to transition from inactivity to activity. The education effect is strongest for the college graduates. College graduate wives are about sixteen percentage points more likely to transition from inactivity to activity than are wives who are only high school graduates. In contrast, if the husband is educated, the wife is less likely to transition into the labor force.

The results indicate that the number of young children is negatively and significantly related with the wife's transition to the labor force. This effect is strongest for the number of children aged zero to four. Having one more child in this bracket decreases the probability of transition into the labor force by two to four percentage points. This is consistent with our expectations that married women with small children are less likely to participate in the labor force due to their responsibilities as caregivers at home.¹² Having children aged twelve to fourteen does not affect the wife's transition probability. Finally, the number of other adults in the household has a negative and significant effect on the wife's transition probability for some years and is insignificant in others. The number of other adults in the household might be an indicator of pension recipients in the family decreasing the need for the wife's transition to the labor force.

We also examine whether there are any differential effects of the husband's job loss across the wife's sociodemographic characteristics such as education and number of children by using interaction terms of husband's job loss with other covariates. We find the interaction of wife's high school graduate status with husband's unemployment status to be positive and significant in 2008 and 2009. This suggests that a high school graduate wife is more likely to join the labor force than is a similar wife with less education in response to her husband's job loss in 2008 and 2009. Coefficients on other interaction terms are insignificant. These results, though not shown, are available upon request.

Since our data set is a pseudopanel constructed by using retrospective questions on labor market outcomes from yearly cross-sectional HLFS, we also have replicated our estimations with unrestricted yearly cross-sectional data. We find that the added-worker effect remains positive and significant in these estimations; there are slight differences in the AWE point estimates. Results are available upon request.

Is There a Discouraged-Worker Effect? Pooled Sample Probit Estimations

To observe whether we also find evidence for DWE, we next turn our attention to the analysis of the effects of macroeconomic conditions on the LFP of married women. To determine the respective

Table 4. Wife's transition probability and employment conditions: Pooled pseudopanel sample probit results

Explanatory variables	Coefficients	Marginal effects
Husband's transition	0.35*** (0.02)	0.04
Husband's age	0.04*** (0.008)	0.004
Husband's age squared/100	-0.06*** (0.01)	-0.006
Wife's age	0.07*** (0.007)	0.007
Wife's age squared/100	-0.12*** (0.01)	-0.01
Children (aged 0-4)	-0.33*** (0.01)	-0.03
Children (aged 5-11)	-0.14*** (0.007)	-0.01
Children (aged 12-14)	-0.009 (0.01)	-0.0009
Husband's Education Variables		
Primary school graduate	-0.05 (0.03)	-0.005
Middle school graduate	-0.08** (0.03)	-0.007
High school graduate	-0.17*** (0.03)	-0.01
College graduate	-0.33*** (0.04)	-0.02
Wife's Education Variables		
Primary school graduate	0.19*** (0.01)	0.01
Middle school graduate	0.31*** (0.02)	0.03
High school graduate	0.49*** (0.02)	0.06
College graduate	1.13*** (0.02)	0.22
Number of other adults	-0.03*** (0.01)	-0.003
Macroeconomic Indicators		
Change in regional unemployment (percent)	-0.05** (0.02)	-0.005
GDP per capita (in 1000)	0.00001*** (0.000004)	0.000001
Intercept	-3.12*** (0.13)	
Log-Likelihood	-37,880.519	
Pseudo-R2	0.05	
N	201,900	

Notes: *Significant at 10 percent level; **significant at 5 percent level; ***significant at 1 percent level.

effects of AWE and DWE on wife's LFP decision, we pool the six two-year pseudopanel data set from TURKSTAT and form a pooled pseudopanel data set for 2005–10.

Table 4 presents the probit estimations using this pooled data. The coefficients and average marginal effects are presented in columns 1 and 2, respectively. In this estimation, sociodemographic variables used are the same as in Table 2. We include rate of change in regional unemployment rate to measure the DWE and regional GDP per capita in 2001 to control for level of regional economic development.

We find that husband's involuntary unemployment status has a positive and significant effect on wife's transition to the labor force. A change in husband's unemployment status from employment to involuntary unemployment increases the probability of wife's transition from inactivity to activity by four percentage points, similar to our two-year pseudopanel estimations.

When we consider the effect of changes in regional unemployment rate on wife's LFP decision, we observe that as the regional unemployment rate increases, the probability that a wife will transition from inactivity to activity decreases. A one percentage point increase (decrease) in the unemployment rate decreases (increases) the probability of transition from inactivity to activity by 0.005 percentage points. Hence a worsening of overall employment conditions appears to have a small discouraging effect on wife's transition into the labor force. We should emphasize, however, that since our data set is

conditioned on wives who were not in the labor force in the previous year, we are measuring the participation probability of wives in the current year given that they were not in the labor force in the previous year. Hence it is the wife's transition probability from inactivity to activity in response to changes in employment conditions.

We find that wife's transition probability is positively and significantly associated with the regional GDP per capita. This variable is a proxy for the increased labor market opportunities for women in more developed regions, and hence its positive effect on participation is consistent with expectations. The effects of other sociodemographic variables are similar to the two-year pseudopanel results of Tables 2 and 3.

It is interesting to note that the number of other adults in the household has a negative effect on wife's labor-force participation similar to the two-year pseudopanel results. Interestingly, the literature presents mixed results on the effect of household structure on female labor participation (Butler and Horowitz 2000; Maurer-Fazio et al. 2011). In Turkey, extended-family members such as grandmothers and aunts have traditionally resumed the role of childcare provider when parents need to work. Hence, this might encourage women to increase their labor supply. However, other adults might also be pension recipients that help the household smooth consumption and decrease the need for the wife to join the labor force in response to her husband's job loss.

Since our data set is a pooled pseudopanel constructed using retrospective questions on labor market outcomes from yearly cross-sectional HLFS, we are essentially observing the discouraged-worker effect on a restricted sample. We also replicate estimation in Table 4 with unrestricted pooled yearly cross-sectional data where we use level of regional unemployment rate instead of rate of regional unemployment rate. The dependent variable is equal to one if the wife is in labor force, or zero otherwise. The AWE estimated using this yearly cross-sectional data is similar to results with the pooled pseudopanel. However, in this estimation we find a higher DWE: A one percent increase in the level of regional unemployment rate is associated with a 0.47 percentage point decrease in wife's LFP probability. These results are available upon request. Even this higher estimate is still lower than the finding in Gong (2010), who finds that a one percentage point increase in the level of regional unemployment rate decreases wife's LFP probability by 1.2 percentage points using a yearly cross-sectional data set from Australia.

We redo the pooled pseudopanel data and pooled yearly cross-sectional data analysis by clustering errors at the region level as a robustness check. In the pooled pseudopanel sample, the change in the rate of unemployment rate from previous year to current year loses its significance when standard errors are clustered at the region level. In the pooled yearly cross-sectional sample, the level of regional unemployment rate remains negative and significant. GDP per capita is no longer significant in either of these estimations.

Is There an Added-Worker Effect Due to Husband's Underemployment?

Similar to involuntary job loss, underemployment is a labor market outcome where husband would have liked to work more. Unfortunately, we only observe husband's underemployment status in the current period. Hence, we analyze the effects of husband's underemployment status on wife's LFP probability with pooled yearly cross-sectional data of employed husbands. Table 5 presents the summary descriptive statistics for the pooled yearly cross-sectional data of employed husbands. We observe that the share of wives that participate in the labor force is higher in the sample of underemployed husbands than in the sample of (full) employed husbands, and the difference in shares is statistically significant.

Table 6 presents results using the sample presented in Table 5. Control variables are the same as in Table 4 with one exception. We use level of regional unemployment rate instead of rate of change in regional unemployment rate since the household sample is yearly cross-sectional.

We find that wives of underemployed husbands are more likely to participate in the labor market than are wives of employed husbands. A change in husband's status from employed to underemployed

Table 5. Descriptive statistics: Pooled sample of employed husbands, 2005–10

	Husband is underemployed (N = 3,663)	Husband is <i>not</i> underemployed (N = 242,231)
Share of wives in labor force	0.23 (0.42)	0.19 (0.39)

Table 6. Wife's LFP probability and husband's underemployment: Pooled sample of employed husbands, 2005–10

Explanatory variables	Coefficients	Marginal effects
Husband is underemployed	0.35*** (0.02)	0.07
Husband's age	0.06*** (0.005)	0.01
Husband's age squared/100	-0.09*** (0.007)	-0.02
Wife's age squared/100	0.14*** (0.004)	0.03
Wife's age	-0.20*** (0.006)	-0.04
Children (aged 0-4)	-0.42*** (0.006)	-0.09
Children (aged 5-11)	-0.19*** (0.004)	-0.04
Children (aged 12-14)	-0.06*** (0.006)	-0.01
Husband's education variables		
Primary school graduate	-0.09** (0.02)	-0.02
Middle school graduate	-0.12*** (0.02)	-0.02
High school graduate	-0.20*** (0.02)	-0.04
College graduate	-0.22*** (0.02)	-0.04
Wife's education variables		
Primary school graduate	0.20*** (0.01)	0.04
Middle school graduate	0.40*** (0.01)	0.08
High school graduate	0.74*** (0.01)	0.16
College graduate	2.03*** (0.01)	0.44
Number of other adults	0.01* (0.009)	0.003*
Regional unemployment (percent)	-2.62*** (0.11)	-0.56
GDP per capita (in 1000)	0.06*** (0.0005)	0.00001
Intercept	-4.39*** (0.09)	
Year dummies	Yes	
Log-Likelihood	-96.498.246	
Pseudo-R ²	0.20	
N	245,894	

is associated with an increase of 7 percentage points in wife's labor-force participation probability. Significance and signs of coefficients on sociodemographic variables remain comparable to results in Table 4.

Conclusion

In this article, we examine the existence of married women's labor-supply response to husbands' job loss (added-worker effect) and to a worsening of overall employment conditions (discouraged-worker effect) in Turkey using the nationally representative surveys of TURKSTAT for the 2005–10 period. We construct six different two-year pseudopanel data sets based on retrospective questions on labor market outcomes in each year's survey. In each pseudopanel data set we find a statistically significant AWE for Turkey as married women increase their labor-force participation in response to husbands'

involuntary job loss. Empirical studies from developed countries typically find little to no AWE, consistent with life-cycle models and perfect capital markets. We find that husband's transition from employment to involuntary unemployment increases wife's labor-force participation probability by four percentage points. This is higher than in the United States, where Spletzer (1997) does not find a significant AWE, but slightly lower than in Brazil, which is seven percentage points (Fernandes and De Felicio 2005) and much lower than in Mexico, which is 13.8 percentage points (Skoufias and Parker 2006). Turkey had a limited unemployment insurance program during our period of study whereas there was more generous unemployment insurance coverage in the United States and no unemployment insurance in place during the peso crisis in Mexico. Differences in unemployment insurance coverage are possible factors explaining the differences in AWE.

We find that a worsening of overall economic conditions measured by regional unemployment rates has a small negative effect on wives' labor-force participation. A one percentage point increase in the regional unemployment rate decreases the transition probability of a wife from inactivity to activity by 0.005 percentage points.

Husband's underemployment status also has a positive and significant effect on the labor-force participation decision of wives. A change in husband's employment status from employed to underemployed is associated with a decrease of seven percentage points in wife's LFP probability.

In conclusion, we find that both AWE and DWE exist in Turkey though AWE appears more important. It is an open research question whether AWE or DWE will have any general equilibrium effects on wages. AWE will put downward and DWE will put upward pressure on wages. Our results on the AWE are short-term effects of husband's involuntary job loss on wife's labor-force participation. Further research is needed to examine whether wives who join the labor force will continue to participate in the labor force in the long run. This is especially of interest in a country such as Turkey where women's traditional roles as mothers and their low education levels are barriers against their permanent presence in the labor market.

Notes

1. In the model, Ashenfelter (1980) suggests that a decrease in the employment of a family member tends to raise the labor supply of family members if their nonmarket time is substitutable with that family member.

2. The budgetary pressure of publicly provided unemployment insurance programs has led economists to wonder whether such programs crowd out private insurance mechanisms, and some argue that AWE is small in the United States due to the generous public unemployment insurance program (Cullen and Gruber 2000).

3. The two countries are vastly different in level of development and labor market conditions. Serneels (2002) reports an unemployment rate over 50 percent among urban young men in Ethiopia whereas in Brazil, the unemployment rate of urban men is less than 10 percent during the period studied by Fernandes and De Felicio (2005).

4. The countries that Cho and Newhouse (2013) examine are Argentina, Brazil, Bulgaria, Chile, Costa Rica, Egypt, Indonesia, Jordan, Latvia, Lithuania, Macedonia, Mexico, the Phillipines, Poland, Romania, South Africa, and Turkey.

5. Programs such as unemployment insurance, in addition to well-functioning capital markets, help protect households from the adverse effects of negative income shocks in developed countries. In Turkey, there is a much more limited unemployment insurance system compared to developed countries.

6. Our focus group is urban married women. In our sample, labor-force participation rate of married urban women increased from 16 percent in 2005 to 26 percent in 2010. In rural areas, FLFPR is higher since women working on the family farm are considered "unpaid family workers."

7. Berument et al. (2009) show that income-increasing policies are more effective in reducing unemployment than are interest rate or exchange rate policies in Turkey, implying that recessionary periods are likely to have significant effects on Turkish labor markets.

8. Even this may be criticized for possible endogeneity because husband's effort level and attitude may have played a role in his being fired or laid off. One could argue that his effort level and attitude at the workplace might be endogenous to his wife's labor supply.

9. Unfortunately, we only observe region of residence in the current year. Hence, in this estimation we assume that a couple lived in the same region in the previous year and test the effect of rate of change in regional unemployment rate on wife's transition probability into the labor force. We also do a pooled yearly cross-sectional

analysis of DWE in which we estimate the effect of the level of regional unemployment rate in current year on wife's LFP as a robustness check. This latter approach has been used in Gong (2010). The results of the latter analysis are available upon request.

10. According to the TURKSTAT, an individual is considered underemployed if he or she is working less than forty hours a week and would like to work more hours or would like to change jobs due to insufficient pay.

11. We do not observe whether a couple in the current period was also a couple in the previous period. The average marriage age for women is 23.5 in Turkey. Hence an older married woman is more likely to be married in the previous year than is a younger married woman. To check the robustness of our results, we redo our estimations in Tables 2 and 3 for couples where the wife is older than thirty as well as for couples where the wife is older than thirty-five in the current period. Our results on average treatment effects of husbands' involuntary job loss remain significant and comparable to our estimations using the whole sample of women. Note that the divorce rate is still low in Turkey compared to developed countries. In 2005, the crude divorce rate was 1.3, much lower than the 27 European Union member countries (EU-27) average of 2.0 (Demirkan and Ersoz 2009).

12. Lokshin and Fong (2006) find that the labor-force participation decision of mothers is very sensitive to the price of childcare.

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