



Palestine Polytechnic University
Faculty of administrative sciences and informatics

The intra _ household labor supply responses of siblings to job loss for
primary earners in a household

Is there an added worker effect over the period 1999 - 2012?

The case of West Bank

By:

Nael Abu Sharar

Khadijah Abu Aram

Supervisor:

Dr. Belal Fallah

Abstract: The main objective of this paper is to investigate if there is an added worker effect in West Bank over the period 1999 – 2012. More specifically, we will assess the probability of sibling to enter the labor force in response to his/her male household's head loss of employment. After introducing the topic and survey the economic literature on the issue under study and discussing the data used and introducing the econometric technique, we estimate a Bivariate Probit model with Panel data to achieve the aforementioned objective, and we did not accept the added worker hypothesis, and concluded that the sibling decision whether to participate in the labor force or not is not directly related to his/her household's head employment status but rather it depends on the sibling specific individual characteristics such as age, gender, and educational attainment.

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1. Introduction:

Over the years, the Palestinian Labor Market has undergone various structural changes, many not to the advantage of workers. Foreign control of Palestine, especially the control imposed by the current Israeli occupation, has hampered and restricted natural development of the labor market. In addition, some analysts consider the employment of Palestinians by the Israeli economy a case of dependency by the Palestinian labor market on the Israeli counterpart, and in general the Palestinian economy as a whole. Therefore, the present paper clarifies whether or not household's members change their labor decisions in response to shocks surrounding them regardless whether it is expected or unexpected. In order to examine this, we focus on the existence surplus of labor in a household and its reactions to the shocks experienced by main income earners in a household. That is, the first purpose of our paper is to examine the existence of the added worker effect (AWE). Therefore, we utilize panel data containing household's information so that we can specify a better estimation model. More specifically, this paper investigates the responsiveness of siblings labor supply to their household's head loss of employment. Another purpose of the paper is that we not only use Palestinian household data but also highlight the period when the AWE could exist if there is any in this country. That is, our sample period (1999-2012) includes the period when Palestine's unemployment rate increased dramatically at Al – Aqsa Intifada period.

It is important to examine the existence of the AWE in Palestine for mainly three reasons. First, as we mentioned before, Palestine has experienced a sharp rise in unemployment and a dramatic change in the employment atmosphere in the past years, which provides us with a suitable context in which to examine the changes in households' economic behavior if any such as household's labor supply. Second, Palestine is famous for having a large proportion of females and young population with low labor force participation rate. It is interesting to observe how Palestinians labor-risk-sharing within a household has changed or not changed after a rise in male household's head unemployment. Finally, so far, there have been no tests of the AWE for Palestinian households, the present paper is the first attempt to clarify the existence of the AWE in Palestine.

As we mention in the previous paragraph this paper is the first that empirically investigates the effect of changes in one individual's labor supply and employment status on other household member's decision of labor force participation. Typically, these analyses refer to the effect of a household's head unemployment on his siblings' labor supply decision. However, little is known about the effect of household's head changes in labor force participation on his siblings' labor supply decisions in Palestine. Therefore, this paper attempts specifically to address this issue.

The remainder of the paper is as follows. In section 2, we provide a brief glimpse of the Palestinian labor market trends and characteristics. In the following sections 3 and 4, we shortly outline the theoretical framework underlying the added worker hypothesis and summarize previous literature. In section 5, we describe our empirical strategy and present the data used in the empirical analysis as well as the results of our analysis are discussed and section 6 concludes.

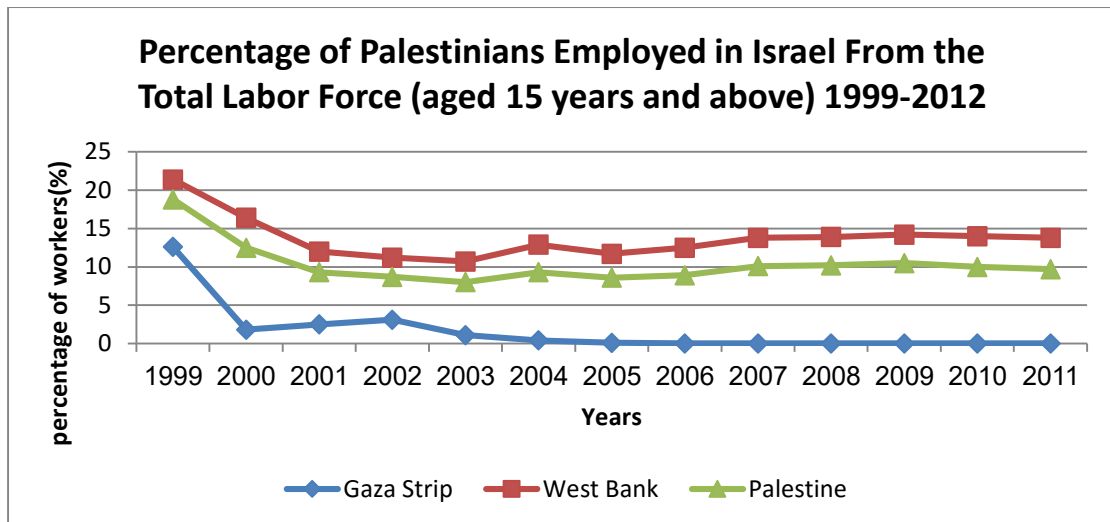
2. Overview of The Palestinian Labor Market:

When the Palestinian National Authority took control in 1994, it was faced with a poorly regulated, highly segmented, deteriorated, and distorted labor market. This history made it difficult to guide the Palestinian Labor Market towards innovation, growth and development. Therefore, the Palestinian Labor Market remains underdeveloped over the years. Moreover, it suffers numerous structural issues including lack of social and employment security for those outside the public sector, poor work conditions, low female labor force participation, work-related gender bias against females, weak unions, low union participation and the absence of a national provision of an occupational safety Kanafani (2012). Moreover, Palestinian workers have struggled with low wages in the face of increasing living expenses, and high unemployment, among other structural problems. Chronically high unemployment has led a large number of Palestinian workers to seek employment outside of Palestinian Labor Market, especially in Israeli labor market and its settlements. The result is a high degree of Palestinian dependency on the Israeli labor market Al-Kafri (2010).

Over the years, the issue of unemployment taking high concerns among related government institutions and decision makers in Palestine, due to its negative impact on poverty, and lowering living standards. At previous times, until the present, unemployment rate is reaching higher rates in Palestine, it is exceeding the

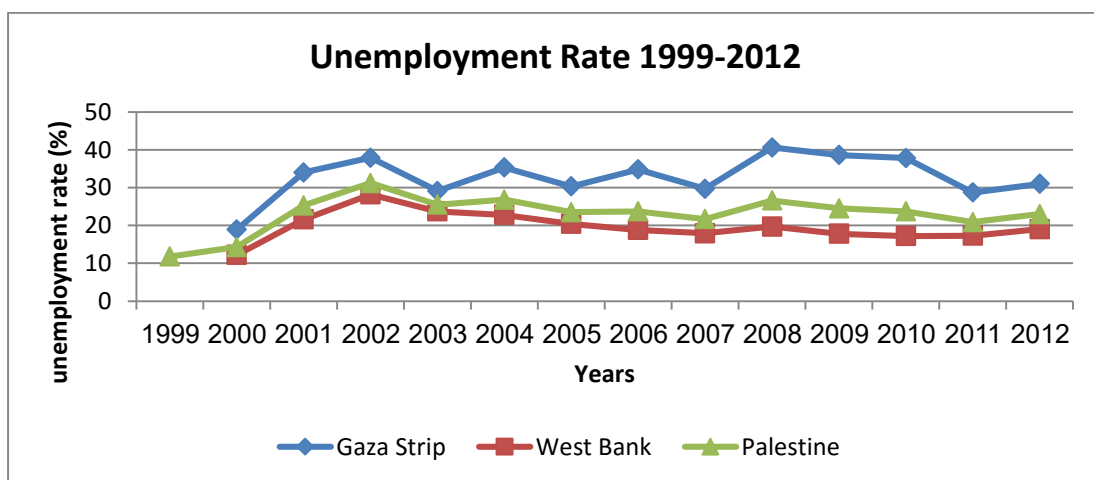
neighboring countries or less developed countries Sadeq and Elder (2014). The main reason behind the accelerating unemployment rates is referred to the strict Israeli measures and restrictions that are aiming at starving the Palestinian people with all means as paralyzing the traffic movement between residential communities and imposing curfews for different times and at different periods on some communities. Moreover, preventing Palestinian workers from working in the Israeli labor market European Training Foundation (2014).

Due to closure policy imposed on the Palestinian labor market, and preventing Palestinians to work in the Israeli labor market, especially the employment issue during and after the outbreak of Al-Aqsa Intifada (September, 2000), the percentage of Palestinian workers in Israel as a percent from the total Palestinian labor force reached about 19% on the eve of Al-Aqsa Intifada (excluding Palestinian workers holding Israeli ID cards or the Palestinian Jerusalemites) the percentage was 21.4% in the West Bank and 12.6% in Gaza Strip, then, their percentage decreased dramatically in unexpected way to reach about 8% from the Palestinian labor force in the end of 2004 (10.7% in the West Bank, and 1.1% in Gaza Strip). As a result, the Palestinian labor market exposed to a big shock in the local labor market supply and demand. The high rate of wages to Palestinian Laborers in Israel in comparison to the wage rate at the local Labor market played a significant role in the increase of the rate of Palestinian workers in Israel before the restriction imposed to prevent their access to their work places, despite the risks encountered those working in Israel. In other words, regarding work place, the percentage of employees in Israel and Israeli settlements has decreased dramatically, and Israel tried to replace them by workers from Eastern European and Asian Countries Miaari and Sauer (2006). The following graph depicts the percentage of Palestinians employed in the Israeli Labor Market from the total Palestinian Labor Force aged 15 years and above over the period 1999 – 2012.



Data source: Palestinian Central Bureau of Statistics.

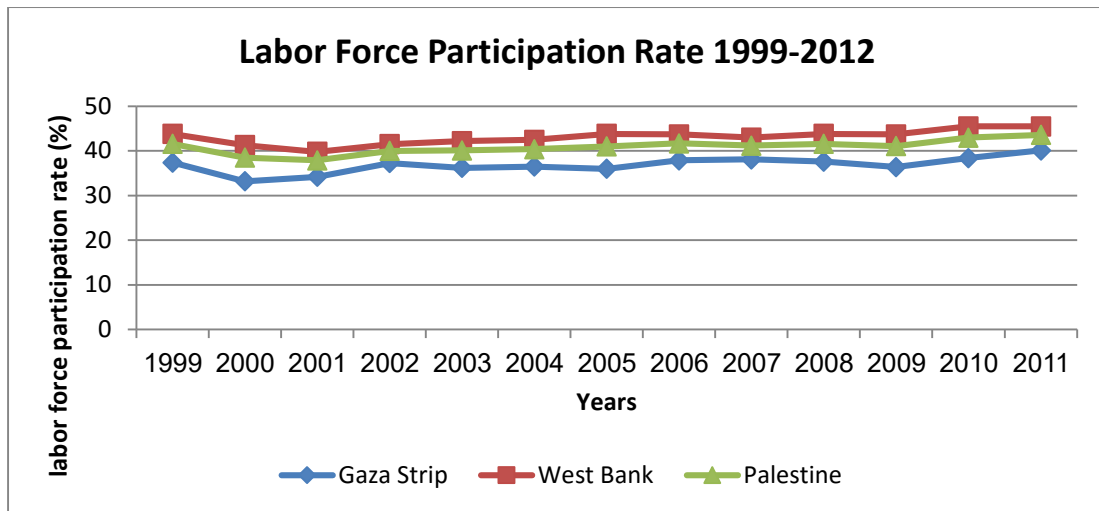
As a result to the above mentioned Labor Market shock, the obvious evidence was the rise of unemployment rate to more than two doubles at the beginning of Al-Aqsa Intifada. So, when it erupted, the Palestinian Labor Market was negatively affected, unemployment rate increased dramatically in unexpected way and reached 31.2 percent in Palestine by the end of 2002 (28.2% in the West Bank, and 37.9% in Gaza Strip), where it was only 11.8 percent in 1999. This accelerating increase in unemployment is mainly caused by preventing the Palestinian workers from reaching their work places in Israel causes a big shock to the Palestinian Labor Market due to the increase of the labor supply in the local labor market after the return of the Palestinian workers whose work in Israel before the Intifada as we mention previously Sadeq and Elder (2014). The following graph depicts the changes occurred in the unemployment structure over the period 1999 – 2012.



Data source: Palestinian Central Bureau of Statistics.

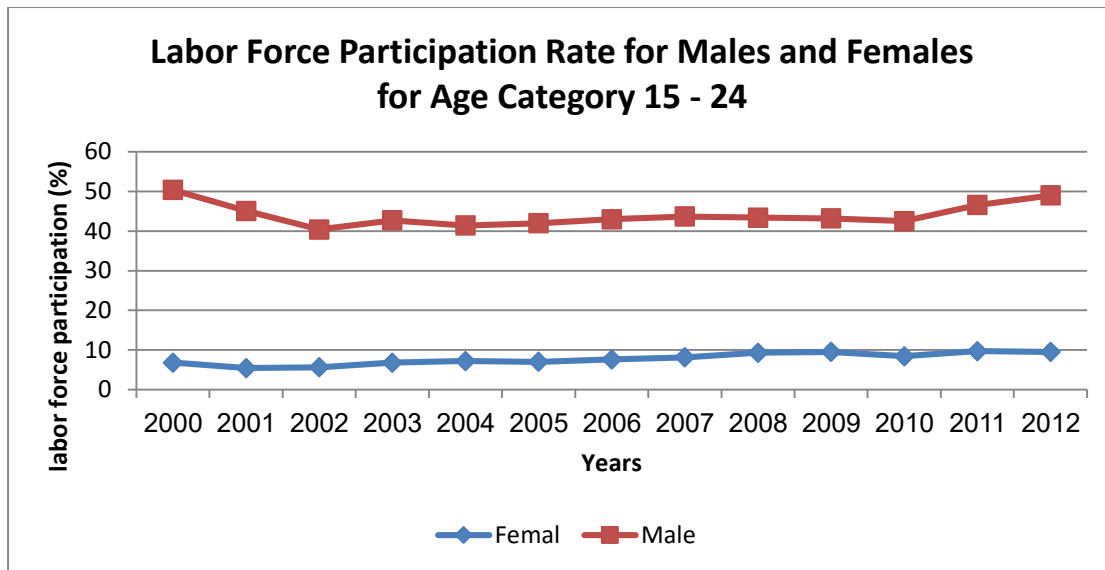
As we mention above, the basic issue emerged due to Al-Aqsa Intifada eruption was about the increase of unemployment to a level never been experienced before in Palestine. Where the number of unemployed amounted to 250,000 worker (during the third quarter of 2002). While it did not exceed 100,000 worker before Al-Aqsa Intifada. Besides, we do have a new category to the unemployment that is called “discouraged people” and amounted to 119,000 due to deterioration of economic conditions that do affect their hopes in finding any job, and causes them to leave the Labor Force out Al-Kafri (2010).

In addition to the above-mentioned losses in the labor market of the workers, a change over the structure of the Palestinian Labor Force was observed. The rate of Participation in the labor force decreased due to increase in the number and rate of the discouraged people. As well as, we had a decrease in the rate of persons under employment added to the unemployed or the discouraged people Sadeq and Elder (2014). Where the rate of Participation in the Labor Force among individuals over 15 years old reached to 41.6 percent in 2000 (43.8 percent in the West Bank, and 37.4 percent in Gaza Strip). Then it decreased to reach about 37% at the end of 2000 (39% in the West Bank, and 34% in Gaza Strip). That occurs mainly due to deteriorated economic and political condition, and to the separation fence around Gaza Strip, Israel controlled thoroughly the entries of laborers to Israel form it, where their rate was 12.6 percent at that time. While in West Bank the situation was little different due to long borders, easy passage at border crossing points to Israel in contrary with the case of Gaza Strip. The general result was a decrease in the labor force participation rate in the period of Al-Aqsa Intifada due to the closure policy imposed on the Palestinian labor market that yielded a category of discouraged workers, and it is somewhat stable around 40% after that period. The following graph depicts the Palestinian labor force participation rate over the period 1999 – 2011.



Data source: Palestinian Central Bureau of Statistics.

One of the most important trends in the Palestinian labor market is the presence of a very young population in the West Bank and Gaza Strip with a low labor force participation rate. The high share of low and middle aged individuals in the working-age population along with a low female participation rate contributes to a low overall labor force participation rate Kock et al. (2012). Another trend is the inability of the labor market to absorb new entrants due to insufficient investment, high political risk, and low development. About 140,000 people have entered the Palestinian labor force since 2010, but the market was only able to absorb 104,000 of them. Unemployment consequently increased and remains high, fluctuating between 20%–24% for the period 2010–2012 Brodmann et al. (2012). Labor force participation rate among young people (aged 15–24 years) in both the Palestinian labor force is low for both males and females, but it is much lower in the latter, the males rate decreased dramatically at the outbreak of Al-Aqsa Intifada from 50.4% in the year of 2000 to 40.4% at the end of 2002, that is mainly refers to the closure policy imposed on the labor market and restrictions imposed on the entries of laborers to Israeli labor market. On the other hand, the females rate has a little decrease did not exceed 1% because they are not a laborers in the Israeli labor market, and we can see that labor force participation for this category is too low and did not exceed 10% over all the years. The following graph depicts the labor force participation rate for males and females falls in the age category 15 – 24 over the period 2000 – 2012.



Data source: Palestinian Central Bureau of Statistics.

As a result of increasing unemployment rates in Palestine since the outbreak of Al-Aqsa Intifada, not only young unskilled workers but also middle-aged male workers have been lost their jobs, laid off or replaced. These middle-aged workers are often the main income earners in their household. Then, how have Palestinian household members reacted to these changes? This paper examines their reactions to male primary earners involuntary job loss in a household, focusing on siblings labor supply responses.

3. The added worker effect:

While much continues to be written about the earnings and unemployment effects of job loss at the individual level in the literature, and much is known about the effects of job loss and workers displacement at the household level. Models of family utility maximization suggest that reduced family income due to the earnings losses of one family member maybe offset by increases in the labor supply of others. Due to the large permanent earnings shock, a job loss presents a situation where such a responses is likely to occur. That is what so called the Added Worker Effect (AWE) Heckman and MacCurdy (1985), and has been examined in several countries. Given that a majority of displaced workers are married, increased labor supply of their spouses and/or siblings may be an important household consumption smoothing response to job loss and displacement Seitchik (1989). In other words, these economic models predict that to compensate the income loss associated with their household's head job

loss, siblings may choose to increase their labor supply, i.e., inactive siblings may newly enter the labor market and become so-called 'added workers' and already participating siblings may increase the amount of hours worked Cullen and Gruber (2000).

In theory, assuming complete markets and perfect information, the AWE expected to be small for two reasons. At the individual level, the first life cycle models show that the income reduction from a temporary shock is negligible in relation to lifetime income Heckman and Macurdy (1980). Intertemporal allocation of other members' time should thus not be too distorted by the transitory unemployment spell or income shock hitting the household head. Second, at the aggregate level, a discouraged worker effect should prevail over the AWE, even if household members individually increase their labor market participation in response to a negative shock affecting the household head, the depressed economy is expected to drive even more members to withdraw from the labor market, the overall impact of the negative shock on additional workers' participation will be negative.

In addition, there are a number of reasons why the AWE may vary across studies, including if household members expect any job loss to be temporary, they are non-market or leisure time is more valuable to them, or they have savings or other resources they can draw on to tide them over in the short-term. In addition, if the local labor market is weak this may not only induce the initial job loss but also make it harder to find work or for a household members to increase their working hours or to participate in the labor market if they are non-participant Bryan and Longhi (2013). There may also be a 'discouraged worker effect' where the job market is perceived to provide so few opportunities that job seekers are discouraged from even looking for work. The AWE may also depend on negotiations between household members about how time will be spent on domestic labor and paid employment Morris (1987). A more recent qualitative study of US labor market also finds that employment responses continue to be structured by existing gender roles and norms within the household Legerski and Cornwall (2010).

4. Literature Review:

Numerous economic studies over the past decade have detailed and studied the negative earnings effects of a job loss and displacement, displaced workers suffer annual earnings losses in the year of displacement with much of those lost earnings due to unemployment. More importantly, displaced and laid off workers face substantial permanent or temporary earnings losses affecting his household Stevens (1997).

In their study Maio, and Nandi (2009) investigate the impact of changes in the Palestinian local labor market conditions and in the Israeli-Palestine conflict on child labor and school attendance of Palestinian children in the West Bank. They use a novel dataset obtained by matching the Palestinian Labor Force Survey with a separate data set of children (10-14 years). They consider the period between the beginning of the Al-Aqsa Intifada (September 2000) and 2006. Using a bivariate Probit model for child labor and school attendance outcomes, they find that an increase in the border restrictions imposed by Israel increases child labor while it does not affect school attendance. They also find that child labor increases when the labor market opportunities improve.

Using panel data to investigate fluctuations in child labor and schooling attendance in rural India, Jacoby and Skoufias (1997) show that child labor varies with income shocks, suggesting that child labor does cope against adverse economic shocks. In Tanzania, Beegle et al. (2006) and that transitory income shocks lead to increases in child labor, particularly in households who have no asset. The effect also appears in developed economies, mostly in cases where access to social security is limited Cullen and Gruber (2000), as well as where the tax system is not too discouraging for the participation of married women activity Harkness and Evans (2011).

Topel (1990) assesses how households behave with respect to the allocation of children's time between work, leisure and school in the face of parental illness. Using longitudinal data, they found that parental illness significantly affects allocation of children's time. The effects seem to be consistent with the traditional female – male roles at household level. Paternal illness increases time spent in market work, whereas maternal illness increases time spent in domestic work, so the effect has gender

dimension. While illness of the mother has stronger effect on girls than boys, illness of the father has stronger effect on boys than girls.

Household level shocks also found to have impact on child labor and schooling. Guarcello, Mealli, and Rosati (2010) assess the impact of shocks such as crime, unemployment, death and migration of a household member on child work and school attendance. They find that children probability of participation in child work is five percentage points higher among children's of household experiencing at least one of the shocks. Considering only children enrolled in school, the probability of working fulltime is 1.5 percentage points higher, implying that shocks can lead to school dropout.

Duryea et al. (2007) using data from Brazil consider a sample of close to 100,000 children aged 10-16 years to examine the effect of unemployment of the household head on child work and schooling. The study reveals that unemployment of the household head for four consecutive months significantly increases the probability of child labor participation, school dropouts and failure to progress to the next grade. Nevertheless, Skoufias and Parker (2006) find no evidence of effect of unemployment on child labor and education in Mexico. Disaggregating the sample into boys and girls, they find, however, that girls are 7.5 to 8.5 percent more likely to miss class when the family experience unemployment of the father. The authors still find no effect of unemployment on girls' participation in the labor force.

Sauerborn, Adams, and Hien (1996) find that intra-household labor supply adjustment used as a key strategy to address labor supply shortages due to illness. Both Sparrow et al. (2014) and Gertler and Gruber (2002) find in Indonesia that other members of the household work more hours when the household head experience poor health. Wagstaff (2007) also finds that labor supply adjustment is an important strategy in Vietnam, especially in rural parts of the country, to cope with health shocks. The finding by Sparrow et al. (2014), however, shows that labor supply adjustment is more important in urban than in rural areas.

Heckman and MacCurdy (1985) use data from the Panel Study of Income Dynamics for 1968 to 1975 to show that the wife participates more in labor markets when the husbands is unemployed. In contrast, Lundberg (1985) and Cullen and Gruber (2000) show that the added worker effect may exist but is quite small in the United States.

Spletzer (1997) shows that there is the added worker effect in the United States, but that is largely explained by unobservable heterogeneity between wives whose husbands have lost their jobs and wives whose husbands have not.

One puzzle faced by many empirical studies to date is that the results are somewhat mixed and the added worker effect is often found to be smaller than theoretically expected, it is a lagged response, or it is not found at all. Some studies find small increases in women's labor market participation when their partner loses his job Heckman et al. (1980); Lundberg (1985); Cullen and Gruber (2000) but others find no added worker effect Layard, Barton, and Zabalza (1980); Maloney (1987).

For their pooled sample, covering all European countries Bredtmann, Otten, and Rulff (2014) found evidence for the existence of an added worker effect. Women whose husbands become unemployed show a significantly higher probability of entering the labor market than women whose husbands remain employed. Their results further show that this effect were mainly driven by wives changes from inactivity to unemployment, whereas wives' probabilities of changing from inactivity to employment seem to be independent of their husbands' job loss. Their results further reveal that the added worker effect varies with the countries' economic conditions. While wives' probability of entering the labor market increases as unemployment rises, it decreases with rising female labor force participation rates, the results of their regressions for five different country groups further reveal that the magnitude and the significance of the added worker effect varies over the welfare regimes within Europe.

5. Estimation strategy and theoretical predictions:

- **Empirical strategy**

In this study, we utilize quantitative method in assessing the effect of various factors on siblings labor force participation, while our primary interest independent variable is their household's head involuntary loss of employment compared with those whom household's head did not experience an employment loss. So, while our dependent variable has a binary outcome (0, 1) in nature, taking value 1 if the sibling were out the labor force in the previous quarter and become in the labor force at the next quarter, and 0 value if he/she were out the labor force and still out of it. For these outcomes, we utilize a bivariate Probit model to assess the probability of siblings to

enter the labor force due to their household's head employment loss with a binary outcomes as shown in the following model.

$$Y_{i,t} = \beta_1 X_{1i,t} + \beta_2 \mathbf{X}_{2i,t} + \gamma_i + \alpha_t + \gamma\alpha_{i,t} + \mathbf{e}_i \dots \quad (1)$$

Where, $Y_{i,t}$ is the dependent variable of a siblings labor force status with a binary outcome (in-out labor force). The $X_{1i,t}$ variable is the main independent variable of a household's head employment status with a binary outcome (employed and unemployed), and the coefficient β_1 measures the probability of a sibling to join the labor force as a result to his/her household's head loss of employment. $\mathbf{X}_{2i,t}$ is a vector comprises a set of independent variables added as a control variables. In addition, the γ_i , α_t and $\gamma\alpha_{i,t}$ are a districts, quarters and their interaction respectively, that are added to the model as a control variables.

In the upcoming sections, we briefly discuss the economic theory behind our approach, describe the data used, and introduce our quantitative method and results.

- **Theoretical predictions on the Added Worker Effect:**

The economic theory on the AWE predicts that the economic shocks can generate added worker and/or discouraged worker effects, and a family's economic stability and the distribution of labor supply within the household also can be affected by any random events that create job instability for primary earners in a household such as job and employment loss, and job displacement Borjas (2007). So, as we show above, when a household's main income earner loses his job, theoretically, other household members might supply more labor either sequentially or simultaneously to compensate for the job loss. Economic models of family utility maximization predict that to compensate the income loss associated with their household head job loss, siblings may choose to increase their labor supply, i.e., inactive siblings may newly enter the labor market and become so-called 'added workers' and already participating siblings may increase the amount of hours worked Cullen and Gruber (2000). The recent research shows that intra-household responses in labor supply play an important role in attenuating earnings losses caused by layoffs and job loss, it is documented in the literature as we previously mention in the literature review section.

- **Data and sample selections:**

In our research, we utilize data from the Palestinian Central Bureau of Statistics (PCBS) Labor Force Survey Data, thirteen years of cross-sectional data from the West Bank labor force survey consists a Panel Database, and it is harmonized for the purpose of the paper. The surveys contain a series of questions pertaining to the labor force participation of siblings and their household's head, and identify demographic characteristics such as age, gender, and specific individual characteristics such as educational attainment. With these data, it is possible to take account of the available characteristics of each individual sibling in the database, and to relate the differences in the observable characteristics of those siblings to differences in their observed labor market behavior.

The survey methodology depends on sample rotation, which makes available of panel data. This rotation technique in the sample gave a chance to interview the household (as a sample unit) four times a year. The first and second visits (interview) to the household are done consequently, while the third and fourth visits are done after two rounds of the survey, Each round of the survey covers a quarter of a year (4 rounds per year), and the period between the second interview and the fourth one to the same household is one year. In other words, in the Palestinian Labor Force Surveys, the same household investigated 4 times over 6 quarters. Two investigations conducted during two consecutive quarters and then after a break of two quarters, there are two more consecutive investigations.

The used data covered the period between the first quarter of 1999 until the fourth quarter of 2012 which consists of 52 rounds (quarters). The data divided into three basic parts. The first part of the data was mainly devoted to study the changes occurred at the individual level, the second part devoted to study the changes occurred at the household level, and the final part are a district and round dummies to control the unobserved heterogeneity that occurred due to the districts or time characteristics that pertains a specific district or period.

Selection criterion imposed to create the required sample for the analysis in this research. The sample selected comprises male household's head as a primary earner in his household, and his siblings (male and female) as an other household members they might participate in the labor force or not due to their household's head job loss.

Also, our sample are restricted only to the households from the WB, the GS is excluded from our analysis due to its special conditions and restriction siege imposed on the flow of Gazan laborers to Israeli labor market since 2004, and to its political and geographical division, also we excluded the district of Jerusalem from our analysis due to its special conditions and issues.

- **Econometric model (variables for the LFP-based model):**

As described in the theoretical section above, the variable of interest is the siblings labor force participation status (whether decide to participate in the labor force or not due to household's head job loss). So, to examine the probability of sibling to participate in the labor market due to his/her main income earner loss of employment in a household an Ordinary (binary outcome) Probit regression is commonly utilized in studying the determinants of an individual's labor force participation, as it properly treats the LFP variable's in-out nature. In this section, we introduce the dependent and independent variables of the LFP-based model, and, where appropriate, describe the reasons behind their creation.

$$\text{LFP (siblings)} = \beta_1 (\text{H.H unemployment})_{i,t} + \beta_2 \mathbf{X}_{i,t} + \gamma_i + \alpha_t + \gamma\alpha_{i,t} + \epsilon_i \dots \quad (2)$$

Where LFP is the labor force participation status for siblings in a household, it is a binary response variable consisting of 0s and 1s, with the 0s assigned to those individuals (observations) who were out of the labor force (neither employed nor unemployed) before one quarter (one lag) and still out the labor force currently, and 1s assigned to those who were out the labor force before one quarter or lag, and he / she currently is a labor force participant (in the labor force), and the coefficient β_1 measures the marginal effect (the probability) of a household head unemployment in a district (i) and in a quarter (t) on the sibling labor force participation decision in district (i) and quarter (t).

\mathbf{X} is comprises many variables that added to the model as a control variables , such as age, it is a demographic factor represented by a number of years for each individual in the sample, the variable is based on LFS's age variable that records the individual's age at last birthday in district (i) and quarter (t). In addition, the education level is another demographic factor represented by a number of schooling years for each individual, the variable also based on LFS's year school variable that records the

number of an individual's completed years of education in district (i) and quarter (t). And family size is added to the model as a control variable represents the number of persons in a household in district (i) and quarter (t). And finally, the place of residence dummies (urban and camps) where the reference category is those whom live in a rural areas are added to the model to capture, if any, the differences between households that pertain their residence areas.

Region dummies γ is also added to the model as a district dummies to capture the unobserved heterogeneity that occur at a district level and cannot be measured to be added to the observed individual characteristics, it is represented by a set of districts where the siblings live, which lists West Bank districts (as we mention previously, our sample is restricted on the individuals who lives in the West Bank only, so we ignore Gaza Strip and Jerusalem district from our analysis). And α is a quarter (round) dummies that are added to the model to control and capture any unobserved heterogeneity occurs due to the changes occur at different times and pertaining a specific period during the sample period. And $\gamma\alpha$ is the interaction between the round and district dummies that is added to the model to capture the unobserved heterogeneity that occurs due to the differing in districts and round characteristics at the same time as an interaction, so it captures the unobservable heterogeneity that differing in a specific district at different periods, and isolate their effects to reach unbiased coefficients.

- **Empirical results:**

We begin our analysis with a simple model model(1), only with the variable of interest (household head unemployment) and district and time dummies and their interaction are added to all models, from the simple model we can conclude that the sibling whose his household head experience an employment loss is more probable to enter the labor force compared with those whom household head did not experience an employment loss. In model(2) we added a gender dummy to distinguish between boys and girls and isolate any differences related to the gender, the both variables are statistically significant, and we can conclude that the girls (females) have a lower or less probability to enter the labor force than boys (males) in response to household head employment loss. From model (3) to model (5) we gradually added the aforementioned control variable to our analysis in order to isolate their effects and to

reach unbiased value to the main variable coefficient, so, we can see that the household head unemployment coefficient changed to become statistically insignificant with the gender, age, and education level are all statistically significant, that means that the boys with higher age and education level have a higher probability to enter the labor market than girls, but the girls also have a probability to enter the labor market due to increasing age and education level, all of that occurs regardless with the household head employment status while it is statistically insignificant. With regard to family size and locality dummies are all statistically insignificant all the way, so the residence area whether it is rural, urban, or camps, and family size did not have an effect on the sibling decision to enter the labor force. Regarding to the age and education squares that added to the model, it is added to capture any nonlinearity effects in the age and education variables, there are found to be statistically significant and have a negative effect as it is expected, so, with a higher age and education up to a specific level the probability of a sibling to enter the labor force will decrease. It may decrease due to the increase in the opportunity cost of education at a specific level, when a sibling reach a high level of education his/her opportunity cost to leave the education out and enter the labor force will be high too. Therefore, we can conclude that the siblings decision whether to enter the labor force or not did not depend on their household head employment status, but it is depend on the personal and individual characteristics of siblings such as age, and education.

All the way, our results are consistent with those whom find no added worker effect in their studies, that is may refer to the Palestinian deteriorated economic conditions and weak labor market especially at Al-Aqsa Intifada period, and social and political conditions. Therefore, we did not accept the added worker hypothesis in our case.

Table (1): Bivariate Probit regression probabilities results:

Dependent variable: sibling labor force participation					
	Marginal Effects (dy/dx)				
Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Household's head	0.0646**	0.0570**	0.0383	0.0207	0.0177
Unemployment	(2.30)	(2.06)	(1.64)	(1.04)	(0.95)
Gender dummy ^(a) (females)		-0.40*** (-25.72)	-0.47*** (-35.08)	-0.52*** (-33.04)	-0.53*** (-33.73)
Age			0.0199*** (9.05)	0.0284*** (8.49)	0.0281*** (8.26)
Age square			-0.0000289*** (-6.71)	-0.000030*** (-6.21)	-0.000030*** (-6.06)
Years of schooling				0.00139*** (2.64)	0.00128** (2.59)
Years of schooling Square				-0.000070*** (-2.66)	-0.000069** (-2.57)
Family size				-0.000181 (-1.32)	-0.000177 (-1.47)
Locality dummy ^(b) Urban					0.0000169 (0.16)
Camps					0.0000135 (1.13)
District dummies	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes
District * time Interaction	Yes	Yes	Yes	Yes	Yes
Number of obs.	4883	4883	4883	3250	3248

Note: *, ** stands for significant at 1%, 5% level respectively. And the numbers between parentheses stands for Z value. All variables have robust standard errors and clustered for districts. Reference group (a) are males (boys), and whose residence area is rural areas in (b). The coefficients are in the form of probability (marginal effects “dy/dx”). “Yes” means that the variable is added to the model.**

6. Conclusion:

The purpose of this paper were to clarifies whether or not siblings as an existence surplus of labor in a household's change their labor decisions in response to shocks surrounding them. In order to examine this, we focus on their reaction to shock experienced by main income earners in their household. That is, the purpose of this paper is to examine the existence of the AWE. Therefore, we utilize panel data collecting by the Palestinian Central Bureau of Statistics containing household's information so that we can specify a better estimation model for the period (1999-2012).

We use a bivariate Probit econometric analysis to accomplish the purpose of the paper, we run a number of model while added the control variables gradually to show how the results changed by them and to reach an unbiased coefficients. The results show that the sibling decision whether to participate in the labor force or not did not influence by his/her household's head employment loss, but it depends and influence positively by his/her age and education level, so the sibling with higher age and education level has a higher probability to participate in the labor force. Moreover, the results show that the boys (males) have a higher probability to participate in the labor force than girls (females) all the ways. In addition, the results indicate that the siblings labor force participation decision is independent and did not influence by his/her family size and residence area of a household, all the aforementioned results are reached with the districts, time, and their interaction dummies added to our analysis and controlled to capture any unobserved heterogeneity.

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