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**"Participation of Women in the Labour Market: The Impeding Forces and  
Drivers"**

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Firma dello studente

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# 1 Introduction

Over the centuries, women were always under the “shadow” of working men, portraying the role of housewives and with no access to the workforce or with no opportunity to become part of the job market around the world. This was connected also to the denied access of women to education and being forced to spend their time on the chores of the household because of the lack of automation such as the dishwashers or washing machines. Everything started to change during the Industrial Revolution; in its early stages, men were considered “the good provider” of the household because the focus of the labour shifted from home to the factory. When in the 20th century, the labour-saving devices such as vacuum cleaners or other household machines emerged, this freed the women from some manual labour intensive activities in the household and lessened the amount of time spent on this kind of activities. However, the latter alone was not enough to bring a change because there were still some socioeconomic factors preventing women from participating in the workforce. Women started performing some activities closely related to their household work such as nursing but were paid considerably less than men because of the assumption that men had to be paid enough to support the family. Married women began entering the labor market with great numbers only in the 1970s and started performing activities that were previously performed only by men (See Figures 1 and 2 that demonstrate the change from 1970 compared to 1978). Over the years, due to some more technological, educational, socioeconomic and cultural developments the notion that women are not able to perform certain tasks physically or mentally lessened gradually and since some decades, women can choose to participate in the labour force (Hannan & Kranzberg, 2017, p. 25, 26). Some of the developments mentioned above that contributed to the labour force participation of women are the increase in demand for office and other clerical workers, the rise of part-time work and the education of women (Goldin, 2006, p. 5, 6, 8). The Figures 3 and 4 shown below demonstrate the increase of female labour force participation worldwide and in Europe, with relation to increase in per capita income and with relation to male labour force participation. However, even now, in the 21st century, the question of various factors influencing or preventing women from being able to apply for a job, search for it, to be eligible enough for being hired and to actually start working still remains. Moreover, the question of women’s labor supply being permanent or temporary, and the factors positively or

negatively influencing the time span are at the core of the further labour market development. Finding the trend with its causes could explain if there is an actual increase in the employment or decrease in unemployment which directly affects not only the labor market but also the economy and the GDP of a country.

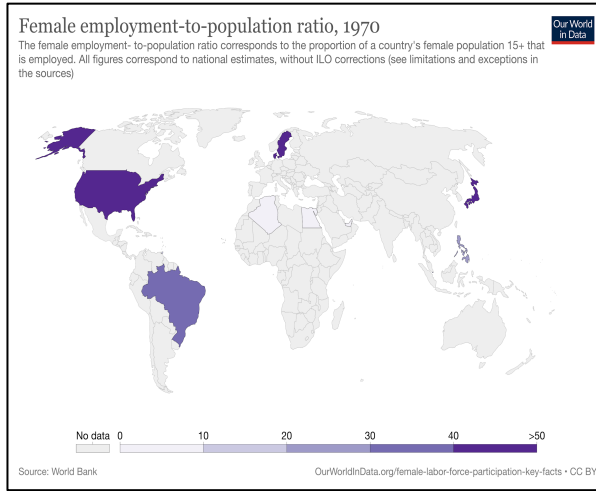


Figure 1- Female employment-to-population ratio in 1970 - Working women: key factors and trends in female labor force participation (Ortiz-Ospina, Tzetskova, 2017)

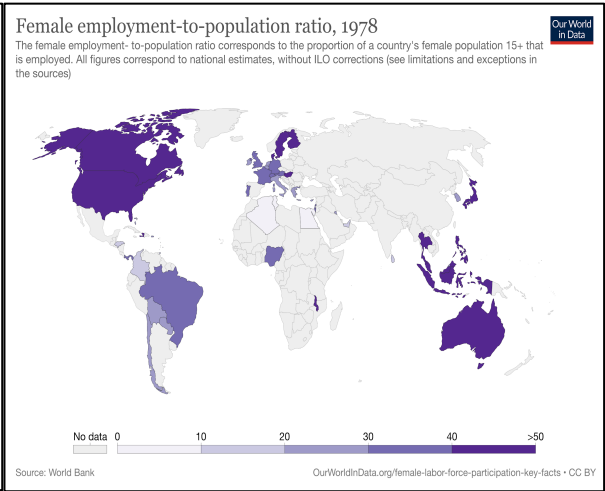


Figure 2- Female employment-to-population ratio in 1978 - Working women: key factors and trends in female labour force participation (Ortiz-Ospina, zetskova, 2017)

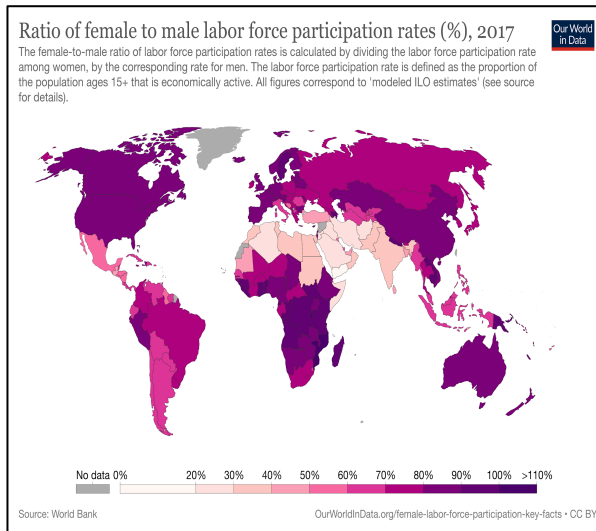


Figure 3 - Ratio of female to male labor participation rates - Working women: key factors and trends in female labour force participation (Ortiz-Ospina, Tzetskova, 2017)

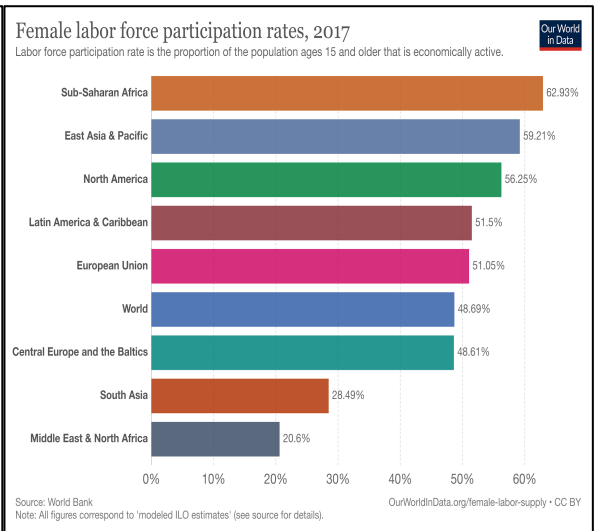


Figure 4 - Female labor force participation rates - Working women: key factors and trends in female labor force participation (Ortiz-Ospina, Tzetskova, 2017)

Over the years, different studies and examinations on the relationship of female labour supply, female employment, and their possible causes have developed the concept of the “added worker effect”. The added worker effect is usually defined as the temporary increase of the labour supply of married women whose husbands have become unemployed (Lundberg, 1985, p. 11). Defined otherwise, the added worker effect is the temporary change in the wife’s labour participation as a response to the changes in household income. Most of the literature focuses on the husband’s unemployment as a change in the household income and estimates the wife’s hours worked as a function of the spouse’s labour supply (Garcia-Escribano, 2004, p. 6). However, it is worth mentioning that this effect comes into place not simply because of the husband’s unemployment but because of constraint on his ability to supply hours of labour. On the other hand, there is also the discouraged worker effect, which is the withdrawal from the labour market because of failed searches; in this case, considered as a potential factor limiting the wife’s ability to respond to the husband’s unexpected unemployment or underemployment by increasing her own labour supply. A discouraging factor for the wife’s job search can be positively associated with poor market conditions such as for example the mismatch between the desired hours of work and the actual hours of work in the labor market demand. The husband’s underemployment can be caused by a reduction in the workweek of his current job, accepting a part-time job instead of a full-time job or losing a second job. He will be considered unemployed if waiting for a call from the employer or actively searching for a job and finally if he currently has no job. All of the above-mentioned cause the family income to decrease and allow the husband to spend more of his idle time not in the workplace which may encourage the wife to increase her labor supply. The two above mentioned are called the income effect and the cross-substitution effect (Maloney, 1987, p. 53).

Analyzing the financial crises and recession in particular in the EU, women’s response regarding the labor market changes depends on job structure, the family, and on the welfare economy. More specifically, it depends on a country’s institutional setting, occupational segregation, the harder hit sectors, the extent of austerity policies and welfare cuts, women’s educational levels, and relative position in the labor market. Female educational gains, improved positions of women in the labor market previous to the crisis, and equal opportunity policies are positively correlated with the increase of women’s labor supply. Evidence shows discouraging worker effect on both sexes, however also a high added worker effect for women in Italy. Moreover, the discouraging worker effect is higher than the added worker effect for women in Italy. This discouraging effect on women in Italy can have several reasons (Addabbo, Rodríguez-Modroño, Galvez, 2015, p. 25,

26). For example, data shows that women in Italy increase their participation in the labor force but in parallel, there is discouragement in active job search, especially in the South (Marino, Nunziata, 2017, p. 5). Most of the women there are inactive, not searching for a job but state that they are available for work or in case of finding a job are not immediately available. This type of behaviour can be influenced by several factors: women’s educational level, age, and presence of children, childcare services, and regional unemployment rates in the South. The distribution of childcare services and access to kindergartens is not evenly distributed in North and in the South, meaning their availability, quality, and affordability are positively correlated with the increase of women’s labour supply. The same relates to the educational levels of women; consistent with the literature, women’s labour supply is positively related to their level of education (Addabbo, Rodríguez-Modroño, Galvez, 2015, p. 31). Moreover, living in regions of South Italy with high unemployment rates coupled with unequal wages and discriminatory working conditions is another discouraging effect for women (See figures 5 and 6). This leads them to devote more time to the housework rather than searching for a job or being discouraged to start working because of the presence of children and no childcare services available. The last resort and a possible compromise for women in this situation is becoming a part-time employee and leaving the job as soon as the other income of the household increases again. Thus, the increase of women’s labour supply, in this case, is temporary and doesn’t contribute to the decrease of unemployment in the country.

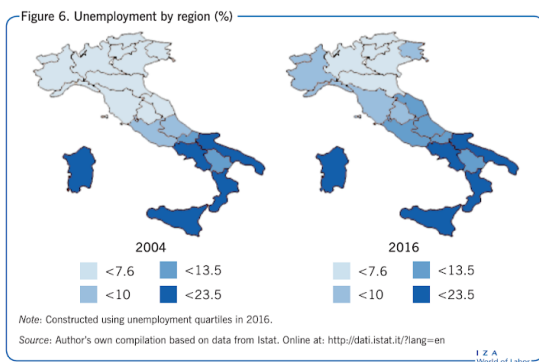


Figure 5 - Unemployment by region - The labor market in Italy (Marino, Nunziata, 2017)

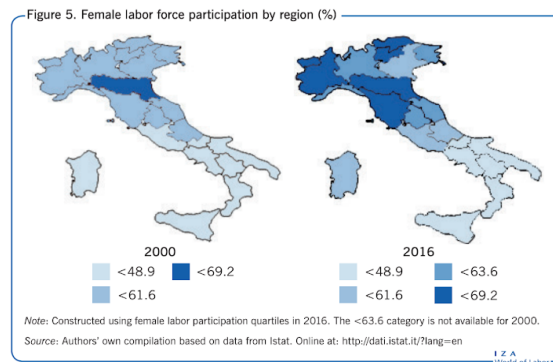


Figure 6 - Female labor force participation by region - The labor market in Italy (Marino, Nunziata, 2017)

Thus, as stated in the sections above, understanding the trend and the relationship of the added worker effect and its consequences on the increase of employment or decrease in the unemployment can serve as a valuable factor in understanding a country's labour market dynamics as a whole. Moreover, the time span of the influence of the added worker effect can be crucial in this analysis; whether the effect on the decrease in unemployment or increase in employment is temporary or long-term. This paper will examine the added worker effect in Italy and analyze the factors influencing the behavior of married women in terms of increasing their labor supply after the financial crises in 2008 and its implications. Thereby, the employment of married women, and in particular, the probability of them to be employed will be compared between 2009 and 2018. In section 2, the relevant Literature Review is presented divided in 4 sub-categories: 2.1) Early literature; 2.2) Income and Substitution effects; 2.3) Later literature and 2.4) The added worker effect in Italy. In section 3, we examine the data taken from the Italian Labour Force Survey, estimate the model for the analysis and present the descriptive statistics both for the years 2009 and 2018. Section 4 shows the results of various factors influencing the labour force participation of married women, including the results about the added worker effect. Finally, the conclusions are presented in section 5.



## 2 Literature review

### 2.1 Early Literature: The Added Worker Effect and the Discouraged Worker Effect

The origins of the added worker effect are at the debate between Don D. Humphrey and W. S. Woytinsky in 1940 (Maloney, 1987, p. 51). Woytinsky published a report stating that during a depression there is an addition to the labour market supply by the so called “forced-entrants”, who temporarily seek employment because the “breadwinner” of the family lost his job (Humphrey, 1940, p. 412). The breadwinner is considered to be the husband and the forced-entrants - the wives living with them in the same family household and “losing the job” entails the husband becoming unemployed. Woytinsky also states that “the progressive recovery of the reemployment will bring the gradual withdrawal of additional job-seekers” (Humphrey, 1940, p. 412). The author based his conclusions on the empirical results that the average rate of unemployment in multi-worker families is higher than the one in single-worker families. Regarding the correlation between unemployment and depression, Woytinsky assumes that unemployment is distributed on a random basis. Humphrey argues that the statistical results obtained by Woytinsky are not enough to state that the uneven distribution of unemployment is a depression phenomenon; on the contrary, it appears at all stages of the business cycle. Furthermore, he argues that unemployment appears among certain groups at all times. The author explains the difference of the rate of unemployment among the multi-worker and single-worker families by the difference in such factors as age, sex, skill and training, work experience and industrial policy of employers. According to Humphrey, young workers aged between 16 to 24 have a higher average rate of unemployment than mature workers. The same applies to unskilled and inexperienced workers compared with those who are skilled and experienced. Moreover, Humphrey argues that the “forced-entrants” or as he calls them “the supplementary workers” cannot have the same age, sex, skills and experience as the family head of the same household even at normal times. Finally, the author argues that there is a discriminatory attitude towards those supplementary workers or working wives: in some firms when it becomes necessary to lay-off workers, the working wives are fired first. Humphrey also states that in order to be able to prove the presence of additional workers in the labor market, the supplementary workers have to

be the same age and sex, have the same skills, experience and training as the breadwinner of the family. In addition, the author argues that the single year census data on which Woytinsky based his conclusions is not enough to check for the increase in unemployment between “prosperity to depression”. By conducting his own analysis Humphrey comes up with opposite results to those of Woytinsky (Humphrey, 1940, p. 412-419).

Humphrey’s claims and arguments do not remain unanswered as Woytinsky publishes his article called “Additional workers on the labor market in depressions: A reply to Mr. Humphrey” in the same year. In this article the author states that his hypothesis of additional workers does not apply to only one business cycle and that the term “depression” refers to the periods of appreciable unemployment (Woytinsky, 1940, p. 735). Woytinsky doesn’t rule out that in some regions and industries there might be considerable unemployment and that there might be breadwinners temporarily out of work, as well as, additional workers at all times. He argues that if his hypothesis is true, then it can be applied to all of the phases of the business cycle. Moreover, he continues with the claim that it was never his intention to avoid testing his hypothesis on a longer time span from prosperity to depression instead of a single year. The author argues that this type of testing requires a long series of experiments and heterogeneous data; unemployment statistics that would satisfy the conditions to prove his hypothesis were not found and the author mentions in his pamphlet “if this analysis is proved to be valid....” stating that he never actually proved it (Woytinsky, 1940, p. 736). According to Woytinsky, both himself and Humphrey found “surplus of unemployment in families with the main breadwinners out of work” and that their argument was based on the origin of the concentration of unemployment. As a response to Humphrey’s claims that the assumption of random distribution of unemployment is incorrect, Woytinsky answers that in case of entry of additional workers there must be a visible concentration of unemployment even if the risk of being fired is distributed randomly among all workers. Moreover, Woytinsky explains that the random distribution of unemployment means that it is unknown whether the unemployment risk for breadwinners is larger or smaller than for supplementary workers (Woytinsky, 1940, p. 735-739).

The debate between Woytinsky and Humphrey served as a starting point for two opposing theories. After Woytinsky suggested his theory of the “additional worker”, others joined him in agreeing that the temporary labor force of “fringe workers” who hoped to augment the family income exaggerated the magnitude of unemployment. Students, older workers and housewives

were considered among the “fringe workers” (W. Lee Hansen, 1961, p. 299). Woytinsky argued that unemployment is increased during the times of depression by those who start seeking jobs because the primary earner of the family became unemployed. As a response to this theory, the proponents of the discouraged worker effect argued that even though temporary work-seekers might appear in the labour market during periods of slack demand, their influence on the unemployment will be offset by those who become discouraged to continue looking for work because of their unsuccessful attempts searching for it. Understanding which of the two above mentioned hypotheses is correct not only explains how the labour market behaves during periods of recession, but also helps to formulate the right anti recession policies. Thus, if the first theory is correct and the government implements certain policies to cope with the total recorded unemployment, including the exaggeration caused by the temporary workers, then the policies will not have the right impact because after the primary workers are re-employed, the temporary work-seekers will simply withdraw from the labour-market (W. Lee Hansen, 1961, p. 300). If, however, the temporary inflow of additional workers is balanced by the outflow of discouraged workers, then there will be no issue.

W. Lee Hansen analyzed the gross changes in the labour supply which show the gross movements of individuals into and out of the labour force as well as employed and unemployed categories measured monthly (W. Lee Hansen, 1961, p. 301) In particular, the author wanted to measure the cyclical sensitivity of such changes in the labour force as: young people searching for permanent jobs after graduation, others withdrawing from the labour market force to marry or to retire, having part-time jobs or becoming temporarily unemployed. Hansen wanted to obtain the net changes on the labour market, employment and unemployment by measuring the changes of the movements mentioned earlier as a response of cyclical changes in demand which he calls “additions” or “reductions” in the labour force. By analyzing the monthly Current Population Survey conducted by the Bureau of the Census from 1948 to 1959 which reflects the changes in the labour force status of individuals within the civilian noninstitutional population Hansen obtained two major results. First, the result that a larger proportion of people flow into the labour force with a rise in unemployment supported the hypothesis of the added workers. Particularly, Hansen found that roughly 50% of those people coming into the labour market supply were housewives. However, the second important results obtained from Hansen’s study proved that reductions from each unemployment category offset the additions to it. The reduction categories were: withdrawals of unemployed from the labour force and unemployed people who became

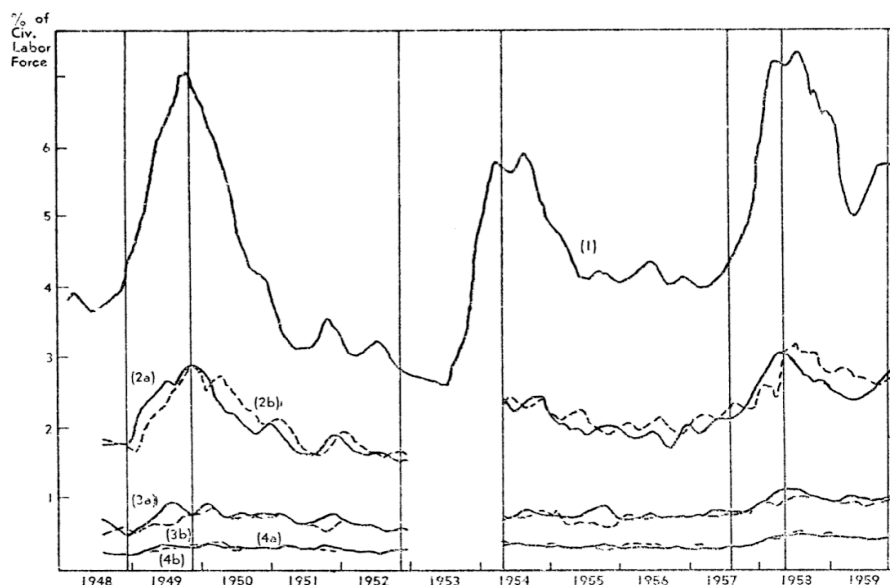
housewives. Thus, Hansen came to the conclusion that Woytinsky's hypothesis has to be rejected and the opposing hypothesis which stated that the increases in additions to unemployment were offset by the reductions in it was supported by his analysis (W. Lee Hansen, 1961, p. 304).

As seen in the Figure 7 below, unemployment was rising during most of 1949 (W. Lee Hansen, 1961, p. 305). However, gross additions to unemployment from outside of the labour force almost consistently exceeded the gross reductions. Moreover, only a small part of the excess consisted of housewives; most of them were students. Hansen supposes that because of the recession the students could not find jobs or that in that year the college enrollments and the number of graduates was exceptionally high. In the 1950s and 1958 the additions again exceeded the reductions, yet as in the previous case, the housewives didn't make any substantial contributions to the flows.

#### HANSEN: LABOR SUPPLY

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CHART 1—RATES OF UNEMPLOYMENT AND OF GROSS CHANGES IN UNEMPLOYMENT, 1948-1959\*



Identification Key :

- (1) Unemployment
- (2a) Gross additions to unemployment
- (2b) Gross reductions in unemployment
- (3a) Gross additions to unemployment from outside the labor force
- (3b) Gross reductions in unemployment owing to withdrawals from the labor force
- (4a) Gross additions to unemployment from keeping house
- (4b) Gross reductions in unemployment owing to withdrawals to keeping house

\* Data were seasonally adjusted and then smoothed with a three-month moving average.

Source: Same as Table 1.

Figure 7 - Rate of unemployment and of gross changes in unemployment, 1948-1959 - The cyclical sensitivity of the labour supply (W. Lee Hansen, 1961, p. 305)

In the end of his paper Hansen makes several important assumptions (W. Lee Hansen, 1961, p. 307, 308). One of the assumptions is that a sizable proportion of female entrants into the labour market, whether housewives or not, will probably be seeking part-time rather than full-time employment. The last three assumptions that the author makes are possible explanations to the failure of individuals to respond to the increases in the level of unemployment. First, the author supposes that the depressions were mild, meaning that the level of unemployment never exceeded 7%. Second, there was a widely available unemployment compensation that permitted many families to maintain their levels of consumption until the layoffs were terminated or other job opportunities arose. Moreover, there was a great availability of consumer credit due to which the wives and children were not forced to seek jobs. And third, there was a relative unavailability of large supplies of “additional workers”. The family members were already occupied each with their chores; the housewives were forced to take care of the house while raising their children or they were physically unable to seek or undertake work and the children had to attend school.

Interestingly enough, the first assumption of Hansen that a sizable proportion of female entrants will be seeking part-time employment was not quite true, as in 1967 out of 16 million married women who participated in the labour force, roughly the three fourth were full-time employees (Bowen & Finegan, 1969, p. 88). In the chapter 5 of their book called “The Economics of Labor Force Participation” William Bowen and Aldrich Finegan analyze some factors affecting labour force status of married women between the ages of 14 and 54 in the year 1960 at a point in time. In particular, they analyze individual and household characteristics such as: 1) children living in the household, 2) age of wife, 3) schooling of wife, 4) occupation of wife, 5) other family income (total family income less earnings of wife), 6) employment status of husband and 7) occupation of husband. They also identify two important subgroups for their study: married women aged 14 to 54 with no children under the age of 6 years old and married women aged 14 to 54 with children under the age of 6 years old. Bowen and Finegan assumed the hours of work of married women as the dependent variable in their multiple regression analysis and analyzed the effects of various dummy variables on the degree of labour force participation. Finally, the authors have run some regression analysis to identify the relationship between occupational work experience and the probability that married women will be in the labour force. Each of the individual and household characteristics analysed by the study and the results are discussed below separately.

- Children

According to Bowen and Finegan, the presence of children can be expected to influence the labour force participation of married women in three ways: 1) by increasing the amount of work to be done in the house; 2) by increasing the family's need for money income and 3) increasing the likelihood that a married woman will participate in the labour force (Bowen & Finegan, 1969, p. 96). The first consideration above will reduce the probability that the wife will search for a job, while the last two increase the likelihood of her participation in the labour market. The authors assume that the quantitative effects as well as net effect of children will vary depending on the ages and number of children and based on how this variable interacts with other variables. Thereby, they measure the age of children with a three-fold breakdown: children aged under 6 years old, from 6 to 13 and from 14 to 17 years old. In addition, married women were classified according to whether or not they have any children in each of the three age categories. From a large F-ratio result (331.6), the authors concluded that the ages of children have a significant effect on determining the labour force status of married women. In particular, 3 main results were found. First, the results obtained for the category of children aged under 6 years old was found to be significantly different from the rest of the categories; meaning, the probability that a married woman with a child or children under the age of 6 would participate in the labour force was one-seventh compared with the probability of one-half for all other categories. The authors connect this result with the fact that preschool children require more care than older children. Second, the authors concluded that there is no evidence to claim that the presence of children is a discouraging factor for labour force participation as a whole, but rather it is the presence of children under the age of 14 and especially under the age of 6 that has an effect on the participation rate. Finally, the third finding of the study implies that the presence of children aged 14 to 17 raises the participation rate of married women in the labour market. The authors assume that by providing a source of assistance with home tasks the older children encourage the mother to enter the labour force (Bowen & Finegan, 1969, p. 98, 99).

- Age of women

The highest adjusted participation rates of married women were found in the age category of 20-44 years old and the other two categories which are the teenagers under 20 and older women between 45-49 and 50-54 had significantly lower participation rates.

The participation rates were adjusted for presence of children, schooling, other family income and employment status of the husband. No significant relationship was found between the hours worked and the age of married women.

- Schooling or education

According to Bowen and Finegan, there is a positive association between the years of school completed by married women and their labour force participation rate (Bowen & Finegan, 1969, p. 114). Additional years of schooling increase a woman's expected market earnings, affect her access to cleaner, more pleasant, more interesting jobs and thereby encourage her to spend her time in the labour market rather than at home. The expected participation rate for women who completed elementary school was found to be 30% and it rises to 40% for those who completed high school and to 47% for women who completed college and finally to 60% for those who graduated from a high education institution (Bowen & Finegan, 1969, p. 115-120). Women who have completed only 0-4 years of education are excluded from the opportunity of getting hired in jobs requiring functional literacy. The employers are not reluctant to hire them because they are likely to be unproductive in most jobs and it will not pay off to compensate them at fair wage levels. Thus, the minimum wage requirements, administrative and legal requirements serve as barriers for hiring those women. Moreover, health handicaps are prevailing among women at the lowest level of education which is another discouraging factor for the employers to hire them (Bowen & Finegan, 1969, p. 121). As to the upper end of the education scale, meaning women who have an education of more than 17 years, the authors believe that the high labour market participation can be attributed to two factors. First, most of the women in the latter mentioned category work in the field of education, which according to the authors has large rewards for those women. Second, Bowen and Finegan assume that married women with high education choose to graduate and to have that education intentionally because they have higher aspirations and "strong tastes" for the labour market as opposed to staying at home (Bowen & Finegan, 1969, p. 122).

- Occupation of wives

Bowen and Finegan analyzed whether the participation of women in the labour market is related to the occupation in which their most recent work experience took place because the rewards vary dramatically depending on the occupation. As the study was concerning only the married women who had a previous occupation, women under 30 years old were excluded from the analysis. The

authors ran a regression analysis adding additional explanatory dummy variables which were the occupational groups by which the women were divided. For example, women who were working previously or during the study as managers, professional workers, craftsmen, clerical workers, other service workers, operatives, sales workers, laborers and private household workers including babysitters, housekeepers and laundresses (Bowen & Finegan, 1969, p. 128). The results together with some supplementary data on earning, unemployment rates and hours of work shown in Figure 8 below stated that the participation rate was 70% for managers and 48% for laborers which leaves no doubt that the occupational group is a determinant of the wife's current labour force status (Bowen & Finegan, 1969, p. 128).

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MARRIED WOMEN

TABLE 5-7

Occupation and Labor Force Participation: Urban Married Women 30-54 with an "Occupation,"<sup>a</sup> Census Week of 1960

Married women 30-54, by occupational group	I. Results from 1/1000 regression				II Other information		
	Number in sample	Percent of population	Labor Force Participation Rate		Median earnings in 1959 of full-year female workers <sup>c</sup>	Urban female unemployment rate <sup>d</sup> (percent)	Percent of employed female working part-time <sup>e</sup>
			Unadjusted	Adjusted <sup>b</sup>			
Managers	371	3.8	73.6	70.0	\$3,800	1.9	14
Professional workers	1,082	11.0	64.4	67.3	4,186	1.4	28
Craftsmen	135	1.4	64.4	62.9	3,555	5.7	18
Clerical workers	3,300	33.5	55.9	61.0	3,546	3.2	18
Private household workers <sup>f</sup>	419	4.3	72.8	59.0	922	5.6	56
Other service workers	1,329	13.5	61.7	58.2	2,102	5.8	35
Operatives	2,047	20.8	59.8	57.3	2,911	9.9	21
Sales workers	1,144	11.6	51.1	48.7	2,370	5.1	40
Laborers	39	0.4	53.9	47.6	2,863	12.7	30
<b>Total</b>	<b>9,866</b>	<b>100.0</b>	<b>59.4</b>	<b>59.4</b>	<b>\$3,118</b>	<b>5.0</b>	<b>28</b>
F-ratio	15.2 **						

Figure 8 - Occupation and labor force participation of married women 30-54 with an occupation, census week of 1960 - The economics of labor force participation (Bowen & Finegan, 1969, p. 128)

- Other family income

The "other family income" is defined as the total family income in 1959 less the earnings of the wife and includes the earnings of other family members as well as property income and transfer payments (Bowen & Finegan, 1969, p. 132). Again the 1/1000 Sample of the 1960 was analyzed and the expected result from the study was that the expected labour force participation of wives should vary inversely with the amount of other family income. Bowen and Finegan found that the participation of the wives in the labour market was decreasing with other family income



increasing when other family income was above the threshold level of approximately \$5000. Below the threshold, the labour force participation rate was insensitive to differences in other family income (See Figure 9).

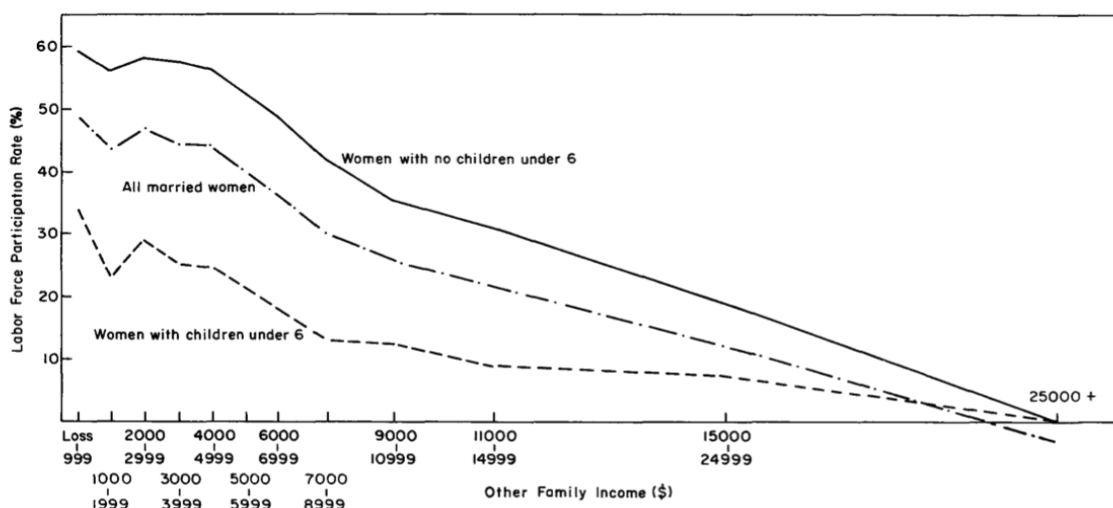


Figure 9 - The adjusted<sup>1</sup> relationship between labour force participation and other family income<sup>2</sup> of married women 14-54, total and by presence and absence of children under 6, census week of 1960 - The economics of labor force participation (Bowen & Finegan, 1969, p. 139)

As seen on Figure 9, the only exception to the tendency of participation rate declining monotonically as other family income increases is at the level of \$1000-1999 of the adjusted participation rate curve of other family income. Bowen and Finegan explain this result by the welfare payments distribution among income classes; 40% of the married women in this range received some form of welfare payments. Another supporting argument to this claim is that the participation trough is much deeper for wives with children under 6 years old who presumably received welfare programs from the Aid to Dependent Children Program (Bowen & Finegan, 1969, p. 141). The result about the tendency of the labour force participation of married women steadily declining as family income rises is further reinforced when variations in hours of work are also considered. Starting from about \$4000 level other family income the hours of work

<sup>1</sup> Adjusted for the effects of color, presence of children, schooling, other family income and employment status of the husband

<sup>2</sup> On the graph the ranges of other family income are represented on the horizontal axis. For example, in the first figure on the graph the other family income increases from a loss to \$999, then from being \$1000 it increases to \$1999 and etc

decline steadily along with participation rates. Finally, the participation rates for the two subgroups of married women with and without preschool children were found to be affected similarly by the changes in other income levels.

- Employment status of husbands

By conducting the study about the employment status of the husbands Bowen and Finegan wanted to test if a wife is more likely to be in the labour force if her husband is unemployed than if he is working (Bowen & Finegan, 1969, p. 148). The authors used 3 dummy variables of the husband's employment status for the study : husband employed, husband unemployed and husband not in the labour market. The unadjusted<sup>3</sup> participation rate in the labour market of married women was found to be much higher if the husband was unemployed than if he was employed. The next step was to account for the household and individual characteristics, especially the other family income, in order to find the adjusted participation rate and observe the correlations with each one of the characteristics. According to their obtained results the authors concluded that the added-worker hypothesis was correct, meaning that higher unemployment rates among male heads of the household lead some additional number of wives (6 to 8 out of every 100) to enter the labour market (Bowen & Finegan, 1969, p. 149). In the subgroup of women with children under the age of 6 the adjusted labour market participation rate for women with unemployed husbands was half as high as for the women with employed husbands. Compared to the other subgroup of married women without preschool children, the “additional-worker effect” was found to be again higher for women with children under the age of 6. The authors explain the latter results by several considerations; first, by the substitution effect, which is when the unemployed husband performs household chores while the wife is working. The substitution effect is the strongest in the families with young children. Second, wives with young children were themselves young and consequently for them it was easier to find jobs than for older women. Third, the lower average age of wives with young children suggests that those families tend to have less savings and thus the wives are constrained to start working. Next, the authors analyzed the difference in participation rates between married women whose husbands were unemployed and married women whose husbands were classified as not in the labour force (Bowen & Finegan, 1969, p. 152). In this case, the status of being “unemployed” is viewed as a more transitory and short-term one compared with “not in the labour market”. The

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<sup>3</sup> Unadjusted for the effects of color, presence of children, schooling, other family income and employment status of the husband.

hypothesis that the authors wanted to test was suggesting that transitory decreases in the husbands' earnings lead to larger increases in the labour force participation of wives than "permanent" reductions. The results obtained by Bowen and Finegan showed that the adjusted participation rate for the wives of the unemployed men was higher than the one for the wives with husbands out of the labour market. The latter finding doesn't hold only for the subgroup of married women with preschool children; for this subgroup of women, the adjusted participation rate was found to be higher if the husbands are not in the labour market than if they are employed. Presumably, the authors assume that as the husbands are out of the labour market they help taking care of their preschool children which makes it possible for the wives to work. An important additional finding suggests that the decrease in earnings of husbands tends to raise the participation rate of wives with husbands out of the labour market above the rate for wives with unemployed husbands. Husbands who are out of the labour market for a longer-term and on a permanent basis can be more counted on providing child-care assistance. On the other hand, the husbands who become unemployed spend some of their time looking for a job and they may be offered regular employment at any time. A further support to the later statement is that the average number of hours worked by married women whose husbands were not in the labour market was significantly higher than the average number of hours worked of wives with employed and with unemployed husbands.

- Occupational status of the husbands

The authors identified different occupational groups of husbands such as professional-technical workers, laborers, managers, craftsmen, clerical, service, sales and operative workers (Bowen & Finegan, 1969, p. 157). After finding that the employment status of husbands has an effect on the labour force participation, Bowen and Finegan wanted to test if the particular occupations also have one. They assumed that the adjusted participation rates would be higher for the wives of professional-technical workers because those men would be relatively liberal in their attitudes towards working wives. However, the analysis showed that the wives of professional-technical workers had the lowest labour force participation rate (See Figure 10).

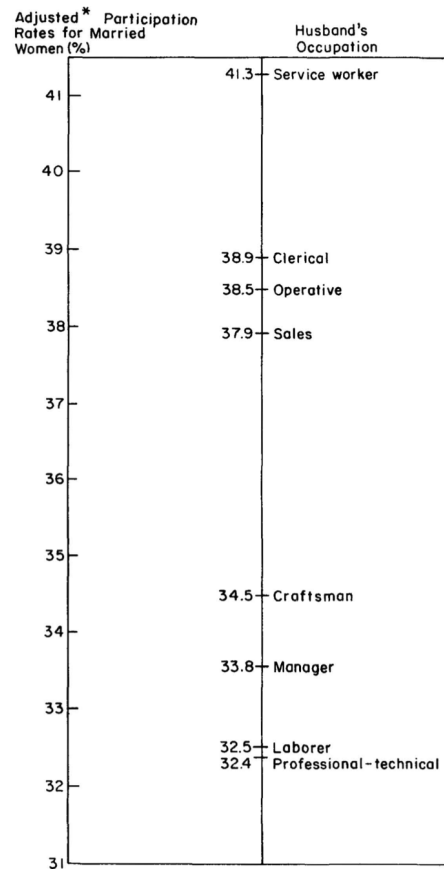


Figure 10 - The adjusted<sup>4</sup> relationship between occupation of husbands and labour force participation rates of married women 14-54, census week of 1960 - The economics of labor force participation (Bowen & Finegan, 1969, p. 157)

The first assumption that the authors make in order to explain the results obtained shown in Figure 10 is that the wives of professional-technical workers and managers might devote their time to community and social activities and thus have less time to devote to searching for a job. The second assumption is that in some of the occupational categories of husbands the expected earnings growth is higher and thereby the participation rate of married women in those categories is lower. The authors also discuss some sociological factors that could serve as possible explanations of the above obtained results. For example, the educational level of husbands' and their willingness to let their wives work; the average educational level of male laborers is the lowest and their wives also have one of the lowest labour market participation rates (Bowen & Finegan, 1969, p. 156). At the other end of the spectrum, the wives of service workers have the highest labour force participation rate which the authors try to explain by assuming that it is

<sup>4</sup> Adjusted for the effects of color, presence of children, schooling, other family income and employment status of the husband.

because there are many employment opportunities for women at service establishments and in retail stores where their husbands work that do not require special skills or formal education. Such establishments are, for example, hotels, hospitals, eating and drinking places where the 40% of the husbands in the service sectors were probably employed. Another assumption is that the distance that the wives have to travel in order to find a job may also serve as an explanation because service workers may live near the city center where it is easier to find a job.

## 2.2 Income and Substitution Effects

In order to understand the added-worker effect in more detail and especially whether it has a long-term or short-term nature, it is important to look at what it consists of. If the earliest literature started from the debate between which of the two major theories is prevailing - the discouraged-worker effect or the added-worker effect, in the later literature two more concepts were suggested, which were the “income effect” and the “substitution effect”. Orley Ashenfelter and Ronald Ehrenberg explain the latter mentioned concepts and their connection with family labour supply, particularly with labour force participation of married women (Ashenfelter & Ehrenberg, 1973). The authors first introduce the theory of labour supply, which states that a family is faced with a number of short-term decisions regarding how to allocate the time available to family members for the labour supply. The authors choose to concentrate only on two family members: the husband and the wife. The decisions that the husband and the wife have to make relate to the amount of time that each family member will take as leisure and since the total amount of time available to them is fixed, they will spend only the remaining of their time on working (Ashenfelter & Ehrenberg, 1973, p. 2). The authors also point out that long-time factors such as upgrading the family members’ skills are not considered in their analysis, thereby it is only short-term. The family can select between 3 choices which are the leisure time of the husband, the leisure time of the wife and the amount of goods and services that can be purchased. The household receives positive satisfaction from the leisure time of the husband, of the wife and from the goods and services purchased. Since the family cannot have all of the three satisfactions at the same time, it has to choose the correct combination of the three in order to make the household as satisfied as possible. There will be a trade-off between the husband’s amount of work effort and the one of the wife. Initially, the family is in an equilibrium state; the total amount of time that the household owns, the net after-tax wages of the husband and the wife and the amount of unearned income available are balanced. However, when the wage rate of the husband changes, the family moves from an equilibrium state to disequilibrium and consequently the amounts of labour supplied by the family members change (Ashenfelter & Ehrenberg, 1973, p. 3). If supposedly the wage of the husband increases, there can be two possible results. On the one hand, the extra hour of work of the husband will permit the family to buy more goods and services and thus induce him to substitute his leisure time with work. This phenomenon is called the “substitution effect” in economics. However, on the other hand, the wage increase also

permits the family to purchase more of all goods, including the leisure time of both the husband and the wife. The latter gain will cause both family members to want to retain more time for leisure. Thus, the wage increase will cause the income of the family to be higher which in its turn will decrease their work effort. The latter phenomenon is known as the “income effect” (Ashenfelter & Ehrenberg, 1973, p. 4, 5). The consideration of the income effect supports the idea that the added-worker effect has a short-term or temporary nature; as soon as the family income increases, the wives will withdraw from the labour market.

Jacob Mincer provides a more detailed examination of the income and substitution effects and their impact on the labour force participation of married women in his article called “Labour Force Participation of Married Women: A Study of Labor Supply” (Mincer, 1962). According to Mincer, there is a positive substitution effect and a negative income effect on the response of hours of work supplied to variations in the wages rate. Just as Ashenfelter and Ehrenberg pointed out, an increase in the wage rate makes leisure time more expensive and increases the hours of work, however for a given amount of hours worked an increase in the wage rate increases the income and due to the income effect the hours of work decrease. Mincer also mentions the “backward-bending” supply curve of labour which is the notion that on average the income effect is stronger than the substitution effect so that an increase in wage rates results in decreased hours of work offered by suppliers of labour (Mincer, 1962, p. 63). The empirical evidence supports the latter mentioned relationship. In particular, there is evidence on the inverse relationship between incomes of husbands and labour force participation of wives.

Before the analysis, Mincer defines the concepts used in his paper (Mincer, 1962, p. 65). First, the author states that the analysis of labour supply using the leisure time as a consumption good would be appropriate only if the market consisted exclusively of leisure time and hours of work. However, according to Mincer, leisure time has a complement, which is the work in general, including also the work that is “not paid for”. The latter includes various forms of investments in oneself or the family. For example, “work at home” as Mincer calls it or the household chores is an activity to which married women devote the larger part of their lives. Thus, when analysing the labour market supply, not only the demand for hours of leisure must be taken into account but also the demand for hours of work at home. Next, the author states that, other things equal (including the family income), an increase in the market wage rate for a family member makes the consumption of leisure and the production of home services by that individual more costly to

the family and thereby encourages greater labour supply by him or her. However, even if the increase in one of the family member's income may not result in a decrease in his or her hours of work, it may still reduce the hours of work of other family members.

Mincer also points out that the income effect will change depending on the degree of substitutability; as substitutes for childcare are much more difficult to come by than those for food preparation or maintaining the household, it is likely that the same change in income of the husband will affect hours of market work of the mother more strongly when small children are present. According to the author, a higher income of husband means a higher family income, which implies less total amount of work of the wife both at home and in the market. Moreover, in families where the husbands have become unemployed, the relative decline in family income is much stronger than the relative decline in the expected wage rates of wives, thereby the labour force participation of wives will increase during recessions (Mincer, 1962, p. 67, 96). Meanwhile, in all other families, incomes are relatively stable but wage-rate expectations decline resulting in a slight decrease in labour force participation of the wives.

In most of the moment-in-time studies, the income effect was prevailing than the substitution effect, however Mincer adds two new features to the studies between income and labour force participation. First, according to the author, the choice that the families have to make is not only between leisure and paid work but also about unpaid work or family chores. The choice will depend on various factors, such as husband's income, wife's earnings, substitutability effect and the desire for market goods, home goods and leisure. Second, based on Milton Friedman's consumption theory, people adjust their consumption expenditures not to their current incomes but their permanent incomes; if the family head earns \$10,000 a year and the family spends \$8000 on consumption, after the earnings of the husband decrease, the family is not going to decrease their consumption but instead spend some savings or by having a member of the family enter the labour market. Young and relatively less educated families may not have much savings, thereby they will most probably choose the second option mentioned above (Mincer, 1962, p. 100, 101).

Finally, Mincer obtains several results some of which support his hypotheses (Mincer, 1962, p. 101, 102). First, he finds that there is a negative correlation between husband's income and wife's labour force participation; the more husbands earn, the less wives work. In addition,



Mincer also finds that the more the wife is capable of earning, the more likely she is to work. Second, the wives are more likely to work if the husbands' current earnings are below permanent earnings.

Several other authors supported Mincer's claim that the more husbands earn, the less wives work. In other words, with the increase of husbands earnings, the temporary added workers, namely wives, would leave the labour market. Gary S. Becker points out that a compensated uniform rise in earnings would lead to a shift away from earnings-incentive commodities and towards goods-incentive ones (Becker, 1965, p. 502). Thus, consumption would be shifted from time-incentive commodities, which however would result in a reduction in total time spent in consumption and thereby in an increase in the time spent at work. Furthermore, Becker states that an increase in the relative market efficiency of any family member affects the reallocation of time of all other members towards consumption activities in order to permit the former to spend more time in the market activities (Becker, 1965, p. 512). Another author Thomas A. Mroz finds a 6 hour reduction in annual hours worked of married women for a \$1000 increase in the family non-wife income (Mroz, 1987, p. 791).

## 2.3 Later Literature: The Empirical Existence of the Added Worker Effect

In their article “A Micro Model of Labor Supply”, Malcolm S. Cohen, Samuel A. Rea, Jr. and Robert I. Lerman elaborate more on the income and substitution effects. First the authors define the additional worker effect as “married women will enter the labour market to maintain the desired family income when it drops” (Cohen, Samuel & Lerman, 1970, p. 67). Furthermore, the additional worker effect relates to short-term or transitory income, while the income effect relates to long-run income response. The authors also mention the discouraged worker effect hypothesis according to which women are likely to drop out from the labour market when the conditions worsen and the probability of finding a job decreases. The authors have run some regression analysis for the years 1966 and 1967 and included such variables as the husband’s employment status, which is useful for measuring the importance of the additional worker hypothesis; it states that when the husband becomes unemployed the wife will be more likely to enter the labour market to bring the family income to its previous level (Cohen, Samuel & Lerman, 1970, p. 71, 75). In addition, a measure of income was included in the study called “FILOW” which stands for the Family Wages Less Own Wages and Income. According to the hypothesis made by the authors, as FILOW increases, participation is expected to drop. For married women, FILOW consisted largely of husband’s income, while for women not living with their husbands, it consisted of their own unearned income. According to the results the short-run income variable, which was the labour force status of the husband was significant and consistent with the theory; married women who had employed husbands during March 1967, had an 8% lower labour force participation rate than women with unemployed husbands. Thus, the latter mentioned result was consistent with the additional worker hypothesis. As to women whose husbands were not in the labour force, there are several important differences when comparing them with women whose husbands are unemployed. First, nonparticipation is likely to be more permanent than unemployment; the additional worker effect is a short-run response. Second, if the husband is retired and has adequate assets to support his family and not look for a job, then the wife is more likely not to search for a job either. Third, if the husband is unable to work, the wife is more likely to stay at home to take care of him. In addition, the years of schooling was also included as a variable in most of the regressions because the more years of schooling completed the greater

the woman's inclination is toward paid work (Cohen, Samuel & Lerman, 1970, p. 77). Again, the results confirmed the hypothesis also about the years of schooling because married women that had completed college had a higher labour market participation than other women.

Another important independent variable for the analysis is the age and number of children as married women with children have to spend more time at home than women without children (Cohen, Samuel & Lerman, 1970, p. 87, 88). The age of the youngest child can be interpreted as the cost of housework or the "tastes" of married women for paid work. As the children get older there is an increase in labour force participation of married women for each of the levels of education tested in the study (see Figure 11), which suggests that the age of children is a measure for the substitution effect between paid employment and homework.

Overall, according to the results of Cohen, Rea, Jr. and Lerman the most important factors explaining the labour supply of adult women are age, marital status, years of schooling completed and total family income minus the woman's own wages (FILOW). In particular, FILOW was found to be negatively associated with labour force participation of married women. Married women with FILOW between \$1500 and \$7500 in 1966 had a participation rate of 15.1% lower than married women with FILOW below \$1500 (Cohen, Samuel & Lerman, 1970, p. 94). Married women with FILOW above \$7500 had a participation rate 23.6% lower than women with FILOW below \$1500 during March 1967. The same negative association was also found between FILOW and hours of work supplied.

Years of schooling completed	White			
	Age of children			
	Some under 3	None under 3 some 3-5	Some 6-17	No children
Under 5 years.....	12.4	21.0	40.1	49.1
5 to 8 years.....	15.6	24.2	43.3	52.3
9 to 11 years.....	20.6	29.3	48.4	57.3
12 to 15 years.....	26.2	34.8	53.9	62.9
16 years and over.....	34.0	37.3	66.6	82.1
	Negro and others			
Under 5 years.....	27.3	44.1	54.6	58.1
5 to 8 years.....	30.5	47.3	57.8	61.3
9 to 11 years.....	35.6	52.3	62.8	66.4
12 to 15 years.....	41.1	57.9	68.4	71.9
16 years and over.....	48.9	60.4	81.1	91.2

1/ Married women, living with their husbands, ages 22-34, with FLOW between \$1,500 and \$7,499 per year living in SMSA's with medium employment change and medium relative opportunities. Based on appendix table F-7.

Figure 11 - Labour force participation of married women by education and number of children, March 1967 - A Micro Model of Labor Supply (Cohen, Samuel & Lerman, 1970, p. 90)

One of the main opponents of the added worker effect theory Clarence D. Long conducted his own analysis in order to understand the creditworthiness of the theory, particularly during severe depressions (Boone & Long, 1958). The author starts his discussion by stating that the depression of the 1930's gave rise to the family members' addition to the labour market after the unemployment of the main breadwinner; in other words, the added worker effect happens because of a fall in demand. Whereas, the opponents of the added worker theory argued that people unable to get jobs or not wanting to work in normal times are attracted by the prospect of high wages, thus will be more likely to seek work or start working during prosperity or a rising demand. Long tried to find out if either of the theories supported the reality. Long analysed censuses in 1931-1937 in the United States and several other countries including Canada, Great Britain and Germany to track the changes in unemployment (Boone & Long, 1958, p. 186-192, 195). The results showed that the number of employed or job-seeking women aged from 15 to 64

was nearly 3 million above the number obtained before depression. Next, the author analysed women with jobless husbands and women with employed husbands in 1940 and standardized for age and child status. The wives with unemployed husbands had higher labour force participation but showed varying tendencies depending on their age, child status and residence; at age 35 and above, the wives of unemployed husbands were more likely to be in the labour force than the wives of employed husbands but the tendency was less under that age. The wives of unemployed husbands were more likely to be in the labour force if they had no children. Finally, the wives of unemployed husbands showed greater labour force participation if they lived in metropolitan districts than in small urban areas. Even after finding these results, Long concluded that there is little evidence or support for the added worker theory because during the depression there were still many more heads of the household employed than unemployed and there were many temporary workers that would withdraw from the labour market because they were not paid enough to cover their expenses or to be rewarded for their efforts. According to Long, there was also a lot of “traffic” into and out of the labour market at all times; even some inflow occurred among men and outflow among women, however with no uniformity to deliver some credible results.

Moreover, the author argues that in a period of mild depression there is no net or gross movement in the proportion of population in the labour force because each month the 4-5% withdrawal was replaced by similar proportion both by men and by women. Long argued that if the labour force fell by the same degree as unemployment then the latter would remain unaffected by the labour force movements if people were abandoning the labour force as fast as they were losing their jobs (Boone & Long, 1958, p. 195).

Next, Long also tries to examine Woytinsky’s theory that there might be labour force additions both for abnormally high and abnormally low employment and withdrawals in periods of balanced prosperity (Boone & Long, 1958, p. 197, 198). According to this theory, labour force additions appeared in mid 1930’s then vanished in April 1940, which was the period of balanced prosperity and finally, reappeared during the war and postwar high employment period. The author argues that according to the 1940 census there was powerful evidence that the labour force was depressed rather than in a balanced prosperity as Woytinsky was suggesting; 8 million people were either seeking jobs or were in public emergency work relief. Those 8 million people were amounting to 15% of the labour force and this number was more than twice the highest

percentage of unemployment that has ever been officially recorded by any other United States census. Moreover, according to Long, the argument that there were additional workers in 1937 but not in 1940 assumes that a decline of unemployment from 20% to 15% was powerful enough to drive out additional workers by 1940. As to the other countries, in particular Great Britain, Canada and Germany, for depressions with up to 18% of unemployment the statistics have shown no dependable evidence of additional workers.

Long concluded that an increase of unemployment during a severe depression causes more people to leave rather than to enter the labour market, as the results show a net decline in participation (Boone & Long, 1958, p. 200, 201). However, the author also analyzes the incomes during the depression. He hypothesised that workers become accustomed to rising income and react only when it ceases to rise or when it declines. According to the census, the participation of males showed a mixed relation to the change in their unemployment, whereas the labour force participation of women declined. Overall, the amounts of labour force participation deviations bore no systematic relations to the amount of deviations in income.

Aldrich Finegan and Robert Margo reexamine the added worker effect during the Great depression of the late 1930s in their article called “Work Relief and the Labor Force Participation of Married Women in 1940” (Finegan & Margo, 1994, p. 64). The authors define the added worker effect as the labour force participation of married women influenced by the unemployment of husbands (Finegan & Margo, 1994, p. 64). The unemployment of the husband interrupts the current income flow of the household and if there are no substantial assets to draw upon or no ability to borrow future income, then the household’s current consumption would decrease. However, if another family member, such as the wife, not currently in the labour force, entered into the labour market and successfully obtained employment, the income of the household could be increased again and the consumption as well. According to the authors, the so called New Deal work relief programs reduced the incentive of married women to seek employment when their husbands became unemployed, which in turn reduced the added worker effect magnitude in the 1930s.

The authors first mention the debate between the two opposing camps (Finegan & Margo, 1994, p. 65-67). Woytinsky, as already mentioned above, being the one who proposed the added worker theory, brought forward the notion that during severe depression, a large number of married

women entered the labour force. However, Woytinsky was also the one who suggested that the added workers would leave the labour force just as they entered it previously when the economy recovers and the unemployment decreases. Woytinsky was criticized by Long and other proponents of the discouraged worker theory who believed that the number of added workers was offset by the number of discouraged workers. The latter were people who stopped searching for a job because of the poor labour market and employment conditions and who would enter the labour market once the aggregate demand was improved. Subsequent research also supported the proponents of the discouraged worker theory, in particular the study of Bowen and Finegan mentioned above (Finegan & Margo, 1994, p. 64, 65). According to Finegan and Margo, all of the previous research conducted failed to take into account the New Deal work relief policies which reduced the size of the added worker effect among married women. Wives of men with “Public Emergency Work” jobs were less likely to be in the labour market during the census of 1940 than other wives. To become eligible for the relief policy after the husband became unemployed, the family income had to be under a certain limit which restrained women from searching for a job (Finegan & Margo, 1994, p. 67). The earnings of other family members were included in the determination of eligibility of the family for receiving the work relief. If the wives didn’t seek a job and didn’t start working, then the family income would stay low and the family would receive the work relief. In this case, even if the husband lost the work relief status, it was not sufficient to cause the wife to enter the labour force; average wages on PEW (Public Emergency Work) were higher than the average wages that the wives could earn in the private sector. If the latter wasn’t the case, then a substantial jump was expected in the labour force participation of the wives once their husbands were no longer of the work relief.

One of the main hypotheses made by Finegan and Margo was that married women who had husbands on work relief were more likely to enter the labour market once their husbands left work relief compared to married women whose husbands were unemployed. This hypothesis was suggested because the authors thought that the wives of men on work relief would have become accustomed to the regular receipt of income and thus after their husbands left the work relief their tastes for market work were increased (Finegan & Margo, 1994, p. 68).

The investigation of the added worker effect was done in two steps (Finegan & Margo, 1994, p. 69). First, the authors examined the differences in labour force participation of married women by the employment status of their husbands. Second, they examined transitions in the labour

force status of married women. The husbands were classified into 4 broad labour force categories, two of which were “unemployed” and “out of the labour force”. The results showed a 7.7% of an added worker effect; women whose husbands were unemployed in 1940 but who had not been on work relief had a 23.8% labour force participation rate compared with 16.1% of women whose husbands were employed in the private sector (Finegan & Margo, 1994, p. 71-74). Unemployment of the husband tripled the entry rate (from 0.9 to 2.7%) when the wives of unemployed men were compared to the wives of employed men in the private sector. On the other hand, the labour force participation rate of wives of men who held PEW in 1940 was only 6.6%, which was far lower than the participation rate of wives of unemployed or employed men. In addition, the wives of men on work relief who were in the labour force did not necessarily succeed in finding employment; they were more likely to remain unemployed than the wives of employed or unemployed men. Most importantly, according to Finegan and Margo, in the published volumes of the 1940 census, a clear distinction was not made between unemployed husbands and those on work relief. Thus, a much broader definition of unemployment was adopted which caused the labour force participation of the wives of unemployed men to fall to 14.9%, which made the cross-sectional added worker effect disappear (Finegan & Margo, 1994, p. 72). Long also fell into this trap while criticizing Woytinsky according to Finegan and Margo; he constructed a table showing the aggregate labour force participation rates of married women classified by their husbands’ employment status without disaggregating them by work-relief status. Thereby, Long’s results showed that the labour force participation rate of wives with unemployed husbands was identical to that of the wives whose husbands were employed. Moreover, Finegan and Margo found that among women whose husbands had been on work relief at some point in time in 1939, 16.8% of those women were in the labour force in 1940, which was 10.2% higher than the participation rate of wives whose husbands were still on work relief. The latter supports the authors’ hypothesis that there is a negative association between the work relief of husbands and labour force participation of married women.

Because the observed results could reflect other factors correlated with the husbands’ employment status that also influenced the labour force participation of the wives, the authors ran logistic regressions taking into account the subsample of Bowen and Finegan (Finegan & Margo, 1994, p. 76). Bowen and Finegan’s research suggested that along with the husband’s unemployment status other characteristics such as the age or schooling of the wives could have an impact on the labour force participation decision. After controlling for these variables, the



conclusion about the work relief and the added worker effect remained unchanged. However, the regressions also revealed that the labour force participation of married women was a function of demographic and household characteristics; younger women and women with no children were more likely to participate than older women or those with children. Married women who had more schooling also were more likely to participate in the labour market compared to those who had less schooling.

Martha Norby Fraundorf also analyzed the added worker effect for the year 1901 in her article called “The Labor Force Participation of Turn-of-the-Century Married Women” (Fraundorf, 1979). The author based her analysis first of all on Mincer’s model, where the labour force participation decision of married women is a choice depending on leisure, income and household chores such as childcare, for example. According to Fraundorf, a married woman will be more likely to work, the lower the family’s income from other sources. If a woman does work, the more she is likely to earn and the less value her time spent on other activities has, thus her personal preference for work instead of leisure increases. The model that Fraundorf used was already analysed by Cain, Bowen and Finegan with the dependable variable being the percent of married women in the labour force and the independent variables being the following: the mean or median of the family income from other sources, variables relating to the value of the woman’s time at home (for example, the number of children in the family) and variables representing differences in tastes (for example, the mean of the educational attainment) (Fraundorf, 1979, p. 402, 403). However, according to Fraundorf some modifications must be made to the basic model in order to analyze the turn-of-the-century married women’s labour force participation. In particular by the turn-of-the-century the author implies the period between the early 1900s and the post World War II era. According to the author, there were 2 important independent variables to consider. First, a source of additional income for married women coming from being self-employed providers of housekeeping services has to be included as a determinant or an influencing factor on a married woman’s labour force participation decision. According to Fraundorf the activity of working as a self-employed provider of housekeeping was very common during the turn-of-the-century; about 24% of the families interviewed in a 1901 survey were earning income as self-employed housekeepers. The activity included cleaning and/or cooking and thus the earnings could be attributed to the wives. Fraundorf’s hypothesis was that the higher the income from this type of alternative earnings, the fewer the number of married women who would have chosen paid employment in the labour market. Thus, this latter variable should have a

negative sign. Second, the turn-of-the-century families were most likely to send their children into the labour force and the mother was usually the last one to take a job because job opportunities for teens were better and children could earn as much as their mothers (Fraundorf, 1979, p. 404, 405). Conversely, during the 1980s, the time when Fraundorf was analysing the added worker effect, the additional worker was almost always the wife because of the child labour laws and compulsory education for children. Many families would prefer to keep the children at school for the sake of their future even if it meant that the mother had to work. Thus, married women entered the labour force if there were no children in the family or until the children were old enough to enter the labour market. All of the behaviors mentioned above were resulting only because the family's income from other sources was decreasing. Therefore, the variable "mean income from all other sources" was included in the model and it was expected to have again a negative sign with respect to the labour force participation of married women.

Another important variable was included in the regression which was the unemployment of husbands. Other things being equal, higher unemployment rate meant that a family's current income was more likely to be below the level to which the family was accustomed and on which its spending was based (Fraundorf, 1979, p. 408). Thus, because of the resulting pressure on spendings and the family income, more married women would choose to enter the labour market. Fraundorf also mentions that greater unemployment rate also means that women were also less likely to find employment, thereby they would be discouraged from entering the labour force. Most of the previous studies had found that the latter, which is the discouraged worker effect was dominating the added worker effect. Thus the unemployment variable had a negative sign in most of the previous studies. Finally, a variable measuring the mean level of educational attainment by women was also included in the model and it was expected to have a positive sign.

The other family income and the "literacy" or education variables were found to be statistically significant. In other words, as found also in the models examined previously, education had a positive effect on labour market participation of married women, whereas the other income had a negative effect. The unemployment of husbands was found to be with a positive sign; as Mincer pointed out, those families will find their income levels being below their normal or permanent levels and thus they will add workers to the labour market in order to maintain the desired levels of income and consumption (Fraundorf, 1979, p. 412). For those families, the effect of the negative transitory income was outweighing the effect of a decrease in the wives' expected

wages. On the other hand, for the families without negative transitory income due to unemployment, there is only the decline in expected wages and thus a decline in labour force participation. During the 1980s the unemployment variable had a negative sign, thus the discouraged worker effect was predominating. However, at the turn-of-the-century, the unemployment was widespread; 49.8% of family heads experienced it (Fraundorf, 1979, p. 413). Moreover, because of the low incomes, it was difficult to accumulate savings, thus unemployment of any family member was threatening the family's survival. Thereby, at the turn-of-the-century, families with an unemployed head were more likely to add workers to the labour force compared to 1980s and higher unemployment rates of the husbands was less likely to mean a lower probability of the wives finding a job. Furthermore, the labour markets at the turn-of-the-century were more competitive so the entry of more women meant lower wages, instead of more unemployment. Fraundorf concludes that not only the added worker effect was larger at the turn-of-the-century compared to the 1980s but also the discouraged worker effect was smaller.

Tim Maloney elaborated more on the added worker effect in his article called "Employment Constraints and the Labor Supply of Married Women: A Reexamination of the Added Worker Effect" (Maloney, 1987). The author argues that in the previous studies the inability to completely specify the constraints limiting the labour supply of the husband and also the ones limiting the ability of the wife to respond to the latter undermines the effect of the added worker effect. In the previous studies, the husband's unemployment was taken as the only constraint on his labour supply and there was no statistical evidence found that the latter increases the wife's actual hours of work. However, if along with the husband's unemployment, his underemployment is also considered and also if a more accurate measure of the wife's labour supply is developed (considering the censoring of her desired hours of work), then the husband's underemployment is found to be positively associated with the wife's hours of work. Because the labour supply of married couples is often simultaneously constrained, the effects mentioned above are not observed in actual work. Thus, Maloney argues that if the effects mentioned above are considered, the added worker increases substantially (Maloney, 1987, p. 52).

Maloney defines unemployment as when one spouse is effectively constrained in the hours of work supplied to the labour market (Maloney, 1987, p. 53). When the husband becomes unemployed the labour supply of the wife may increase because of two reasons. First, the wife's labour supply may increase because of the income effect; the household income decreases

because of the constraints on the hours supplied by the husband. In this case, it is assumed that the increase of the wife's labour supply will have a temporary nature. The second is the cross-substitution effect; when the husband is forced to consume more nonmarket time after he becomes unemployed he may assume some of the household responsibilities of the wife. The latter lowers the wife's opportunity cost of the market work and may encourage her to supply more hours in the labour market. Maloney argues that the constraints on hours of work do not result only in unemployment; they can also take other forms. For example, the husband can lose a second job, or experience a reduction in anticipated overtime. In the case of the wife, her actual hours of work may be constrained as well. For this reason, Maloney assumes the desired hours of work instead of the actual hours of work. The unemployment hours of the husband have no measurable impact on the labour supply of the wife, however, the underemployment of the husband does. The underemployment of the male spouse is associated with a 1706-hour increase in desired hours of work of the female spouse. Moreover, when the unemployment and underemployment of the wife are considered, the wife's labour supply is found to be positively associated with the husband's unemployment as well (Maloney, 1987, p. 60).

In another article called "Unobserved Variables and the Elusive Added Worker Effect" Maloney tries to examine the added worker effect and also to test if the labour force participation of married women is affected by the permanent or transitory nature of the husband's unemployment (Maloney, 1991). The first assumption is that married women are "secondary workers"; they may be less attached to the labour market than married men and their labour supply may be influenced by transitory factors. Maloney wanted to show that the husband's unemployment lowers the price of the wife's nonmarket time and thereby raises her probability of being employed. The author argues that the wives of frequently unemployed husbands may be less likely to participate in the labour market because of unusually low wages that they face (Maloney, 1991, p. 174). In order to test the above-mentioned hypotheses, Maloney assumes that unemployment is when individuals are effectively constrained in their attempt to supply labour to the marketplace. Maloney finds that the wives whose husbands are unemployed have lower employment propensities; the unemployment of the husband reduces the employment probability of the wife by 9% (from 57.8% to 48.8%). The transitory shock of the husband's unemployment has no measurable impact on the wife's probability of being in the labour force, however once she is already in the labour force, it lowers her probability of being employed. In other words, the wife's employment propensity falls from 95.4% to 90.9% or the husband's transitory unemployment nearly doubles

the wife's unemployment rate (Maloney, 1991, p. 179, 181). On the other hand, most of the impact of the husband's unemployment on the wife's labour supply comes from the permanent nature of this event; the permanent unemployment of the husband is positively related to the labour force participation of the spouse. If the average household expects the husband to be unemployed continuously or frequently, then the labour force participation rate of the wife rises from 60.7% to 71.7%. However, since married women with permanently unemployed husbands are themselves more likely to be unemployed once they are in the labour force, Maloney observed the opposite of the AWE. Even if the married women were likely to participate in the labour force, their actual employment rate was reduced because of the low wage rates that they were facing and their unemployment rate quadrupled (Maloney, 1991, p. 183). Maloney concluded that: there was no AWE found by his analysis, that women were not "secondary workers" in the labour market, altering their labour supply in response to transitory unemployment of their spouses and that the husband's permanent unemployment does affect the wife's willingness to work in the labour market but because she faces abnormally low wage rates she doesn't have the opportunity nor the capacity to offset the associated loss in the household income.

In her paper called "The Added Worker Effect: A Reappraisal" published in 1981, Shelly Lundberg tries to analyse the added worker effect according to a model that distinguishes unemployment from non-participation (Lundberg, 1981). The author interprets the added worker effect as a response to uncertain returns to labour supply by members of the household. In her model, each member's current labour force status affects the job search and participation decisions of the other members (Lundberg, 1981, p. 1). Thus, each member's current labour force status affects the other family members' states of employment, unemployment and non-participation. Explained otherwise, the added worker effect is when in families whose employed members lose their jobs, secondary workers enter the labour force in response to the reduction in family income. According to Lundberg, unemployment of the male head of the household affects the labour supply of the wife in two ways. First, there is the transitory reduction in household income which increases the husband's non-market time. Both of the latter mentioned effects tend to reduce the relative value of the wife's non-market time. There are two opposing opinions about the final effect that the reduction in the wife's non-market time has on her labour force participation. Jacob Mincer argued that the transitory reduction in income due to unemployment has a greater effect on the labour supply of married women than the permanent income loss

(Lundberg, 1981, p. 2). Cain, Heckman and MaCurdy, on the other hand, found the contrary results and stated that there is no labour supply response from married women to the transitory income variations of their husbands. According to this view, if the household is not credit constrained, the income effect of the transitory unemployment of the spouse would be negligible. Lundberg disagrees with this view and proposes that the labour force entry of secondary workers is a response to disequilibrium in the household's labour supply and that the household's response will depend on stochastic elements such as duration of unemployment and future wages of the family members. Thus, the author distinguishes between the decision to enter the labour force from the decision to accept a job offer. Moreover, when measuring the added worker effect Lundberg chooses to concentrate on the flows in and out of employed and unemployment of married women instead of their labour force status.

Lundberg uses a two-person model where each individual household member's transition probabilities are interdependent (Lundberg, 1981, p. 4). In other words, the employment status of one family member affects the labour supply decisions and search strategy of the other. As already mentioned above, the non-participation is considered to be a separate state from the state of unemployment. Four major groups were excluded from the sample. First, families with heads over 58 years old or under 18 were excluded (Lundberg, 1981, p. 15). Second, families with disabled heads who were unable to work were also excluded. Third, the initial study was conducted excluding the families of 4 with one working head whose earnings were above 9000\$ and excluding the families of 4 but with 2 working heads and earnings above 11,000\$. Fourth, the units that were not defined as a "family" such as a married couple, a single parent with a child or other families residing permanently with the family were also excluded.

The first important result found by Lundberg in this study was that if the male head was employed, the female head was less likely to make a transition from non-participation to employed compared with married women whose husbands were either unemployed or out of the labour market (Lundberg, 1981, p. 18). The second important result was that the age and number of children under 6 years old had a negative effect on the transition from non-participation to employment of married women presumably because both variables are positively related to the value of non-market time (Lundberg, 1981, p. 19). The third important result found by Lundberg showed that employment of the husband increased the rate at which unemployed wives accepted jobs by almost 50% (Lundberg, 1981, p. 20). The author suggests that the latter result may occur

because an employed husband may be able to assist his wife's job search by providing contacts or information. Lundberg also found that the predicted wage of the female head had a positive impact on the probability of her entering employment. Moreover, other family income was found to be negatively correlated with job acceptance (Lundberg, 1981, p. 22). In other words, both the employment of the male head and his wage had a positive effect on the rate at which female heads were leaving the labour force from being employed (the transition from being employed to being a non-participant).

The study was failing to explain the impact of the spouse's unemployment on the transition between non-participation and unemployment of married women in the labour market (Lundberg, 1981, p. 25, 28). Thereby, Lundberg conducted a simulation of the effects of increasing the unemployment rate of married men and found that the latter was causing additional response in the form of increased participation and employment among their wives in the short-run. In particular, doubling the unemployment rate of 100 male heads, 36 additional wives would have entered the labour force but about 29 of them would have become employed (Lundberg, 1981, p. 30, 33). Thus, the simulation results show that increased unemployment among married men has a short-run effect on both participation and employment of married women. Lundberg concludes that although the increased unemployment among husbands can influence the labour supply of the wives in a variety of forms, including a reduction in the probability of leaving employment, the principal effect is the increased probability of labour force entry of married women (Lundberg, 1981, p. 3).

In 1985, Lundberg published another article on the AWE and used employment transition probabilities rather than static measures of labour supply (Lundberg, 1985). According to the author, in a static model of household labour supply, since the wife's labour force entry is only of the several ways to compensate for the loss in family income, the added worker effect should be measured in relation to costs of other methods, such as income borrowing or a more intensive job search by the husband (Lundberg, 1985, p. 12). The conventional measures of labour supply used in the static models are the average annual hours worked or participation probabilities. Whereas, Lundberg's model uses the flow rates between labour market states, which are employment, unemployment and nonparticipation in order to have a more complete measure of the labour supply behavior and thus the added worker effect. The author argues that studies which use long-term average measures of labour supply are less likely to observe an added worker effect because

they are likely to ignore one of the most important attributes, which is the changes in labour supply behaviour as factors to smooth out fluctuations in the household income (Lundberg, 1985, p. 15). In Lundberg's model the household is subject to a variety of random events, such as changes in the value of leisure time, and most importantly, the random arrival of job offers to the unemployed. A choice between unemployment and nonparticipation will involve weighing the value of lost leisure against the expected benefits from future job offers. Whereas, a choice between unemployment and employment will depend on the relative values income, leisure and expected future offer arrivals associated with unemployment (Lundberg, 1985, p. 17).

Lundberg finds that married women are more likely to participate in the labour force when their husbands were unemployed than were married women whose husbands were employed. However, even if those wives with unemployed husbands did look for a job they were less likely to actually be employed than were women whose husbands were employed (Lundberg, 1985, p. 22). Moreover, Lundberg also found that the probability of women with unemployed husbands entering the labour force was 25% higher than for women whose husbands were employed (Lundberg, 1985, p. 25).. Finally, the author conducts another simulation of an increase in husbands' unemployment. The results again showed that the wives did respond by increasing their labour supply; unemployment of 100 additional men resulted in the labour force participation of 3 additional wives but the employment of 2 (Lundberg, 1985, p. 30). In other words, Lundberg found a 7% of an added worker effect. However, the author also argues that the latter result even understates the real added worker effect since there was some tendency among married women whose husbands were not likely to be employed, to be less likely employed themselves (Lundberg, 1985, p. 14).

James R. Spletzer continues on Lundberg's findings and conducts his own analysis on the AWE in his article called "Reexamining the Added Worker Effect" (Spletzer, 1997). The author defines the added worker effect as "a wife entering the labour force when her employed husband becomes unemployed". Spletzer points out that the added worker effect is a transitory response method to intertemporally smooth family income and consumption (Spletzer, 1997, p. 417). Furthermore, he mentions the income and substitution effects; namely, when family earnings fall as a result of the husband's unemployment, the income effect influences the wife to increase her labour supply. Additionally, Spletzer states that the husband's increased nonemployment time provides a substitute for the wife's home production and thus she is more likely to join the labour



force as an added worker. According to the author, observing the latter two effects results in measuring the magnitude and existence of the added worker effect.

Spletzer points out that the previous literature although explained the added worker effect by theoretical models of family labour supply, such as Ashenfelter's or Mincer's, the empirical work had failed to reach a consensus regarding whether the AWE actually exists and regarding its magnitude (Spletzer, 1997, p. 417, 418). Lundberg and others had found small yet significant added worker effects, however others such as Maloney didn't find any evidence. Spletzer also mentions that all of the previous studies used different data; Lundberg used monthly panel data constructed from quarterly interviews, others used annual panel data or cross-sectional data. According to the author, cross-sectional microdata cannot adequately capture the intertemporal decisions of wives joining the labour force when their husbands become unemployed. Annual measures are also inadequate in measuring the AWE because short spells of unemployment of the husband in the preceding year would not be taken into account that way. Spletzer proposes instead to measure the added worker effect using monthly longitudinal microdata from the Current Population Survey (CPS); unlike other data that were used previously that concentrated only on low-income segments of the population, the CPS data was representative of the entire U.S. population (Spletzer, 1997, p. 418).

Spletzer conducted descriptive statistics first using two panels of CPS. One panel was from December 1988 through June 1989, when the national unemployment rate of men was stable between 4.9% and 5.4% (Spletzer, 1997, p. 419). The other panel was from December 1990 through June 1991, when the national unemployment rate of men was rapidly rising from 6.3% to 7.3%. 37,445 households were used in the study and particularly only those individuals who were married and under 65 years old. The initial results were the following: among the population of married women who were not-in-the-labour-force (NILF) and whose husbands move from employment to unemployment, 11.58% entered the labour force in any given month, 6.59% became employed and 4.99% became unemployed. Thus, the AWE was found in the initial results. In Figure 12 shown below, the characteristics of married women eligible to be added workers and the characteristics of those who were added workers are described in the middle and bottom panels respectively.

According to the initial results, for the women who were NILF and whose husbands became unemployed, were approximately two and a half times more likely to become unemployed compared to the rest of the population of NIFL married women (Spletzer, 1997, p. 422). The latter result, according to Spletzer, hints at inflexibilities in the labour market that force married women to enter into it as added workers rather than choosing to enter based on local economic conditions. The same inflexibilities in the labour market affect the probability of the additional worker women quickly finding employment. Furthermore, the author was supposing that the expected entrance rate into unemployment relative to the entrance rate into employment would be lower for women searching for unskilled and short-term jobs. After controlling for age, education, number of children variables among the others, Spletzer found that the low paying “unskilled” jobs were actually easiest to find (Spletzer, 1997, p. 423).

**TABLE II**  
Married Women’s Descriptive Statistics

Variable	N	Mean	Std. Dev	Min	Max
<i>Population, N<sub>t-1</sub></i>					
Race: 0 = white, 1 = nonwhite	12988	0.0726		0	1
Age	12988	41.4113	11.9499	16	64
Education: highest grade attended	12988	12.5075	2.5663	0	18
1 if children aged 0–15	12988	0.5628		0	1
Number children aged 0–15	7309	2.0391	1.0383	1	9
Mobility: 1 if lived here last year	12988	0.8616		0	1
1 if wife in labor force last year	12988	0.3246		0	1
Weeks wife in labor force last year	4216	28.5344	18.2579	1	52
1 if husband unemployed last year	12988	0.0971		0	1
Weeks husband unemployed last year	1261	15.3537	13.1547	1	52
<i>Husband Employed to Unemployed, N<sub>t-1</sub></i>					
Race: 0 = White, 1 = Nonwhite	400	0.0900			
Age	400	36.3325	10.8679		
Education: highest grade attended	400	11.7900	2.6207		
1 if children aged 0–15	400	0.6800			
Number children aged 0–15	272	1.9926	1.0521		
Mobility: 1 if lived here last year	400	0.7875			
1 if wife in labor force last year	400	0.4125			
Weeks wife in labor force last year	165	30.2424	18.6966		
1 if husband unemployed last year	400	0.4800			
Weeks husband unemployed last year	192	16.6510	12.5776		
<i>Added Workers</i>					
Race: 0 = white, 1 = nonwhite	113	0.1416			
Age	113	33.9204	9.4926		
Education: highest grade attended	113	12.1416	2.6921		
1 if children aged 0–15	113	0.6991			
Number children aged 0–15	79	1.7975	0.8826		
Mobility: 1 if lived here last year	113	0.7434			
1 if wife in labor force last year	113	0.7434			
Weeks wife in labor force last year	84	35.7738	18.2700		
1 if husband unemployed last year	113	0.5133			
Weeks husband unemployed last year	58	19.4483	13.9198		

4-Month CPS Matched Data: December 1988–June 1989, December 1990–June 1991.

Figure 12 - Characteristics of married women, CPS data: December 1988-June 1989, December 1990-June 1991 - Reexamining the Added Worker Effect (Spletzer, 1997, p. 421)

Next, Spletzer examined also what happens when instead of a static model the analysis takes a dynamic model with uncertainty. In the static model, married women responded immediately to the unemployment of their husbands and entered the labour force (Spletzer, 1997, p. 423). However, in the dynamic model, Spletzer hypothesised that those married women should have entered the labour force as before as well as after their husbands lost their jobs. The author finds that a large percentage of the AWE occurs contemporaneously, which means that no evidence of anticipatory or delayed entrance into the labour force was found. The latter results contradict Lundberg's simulation results which showed the wife's labour force participation increase, two months after her husband's job loss. Instead, a substantial amount of married women start looking for work in the same month that their husbands become unemployed.

Finally, Spletzer tests the results found previously about the added worker effect when some observed differences among the married women are controlled for. When the wife's characteristics such as age, education and number of children are controlled, the added worker effect falls from 7.58% to 6% (Spletzer, 1997, p. 424). Particularly, married women aged 16-29 were more likely to enter the labour force, while those aged 45-46 were less likely to do so compared to those aged 30-44. The probability of joining the labour force increased with education and having an additional child under 16 years old lowered the probability of joining it by 2%. Next, Spletzer also controlled for the labour market experiences of both spouses for the previous year (Spletzer, 1997, p. 425, 426). The latter diminished the estimated AWE from 6% to 2.08% and was no longer statistically significant. The wife's labour force experience and the husband's unemployment the previous year were contributing equally for the decline of the added worker effect. Spletzer concludes that, consistent with Lundberg's results, the longitudinal CPS data indicate that women whose husbands incur a labour force transition are more likely to move between labour force states themselves. Thus, even though the author found an added worker effect of 28.25% among married women aged 16-64 who were NILF, whose husbands moved from employment to unemployment, that results didn't hold up; after controlling for observed differences among women whose husbands had different labour force experiences the AWE became statistically non-significant (Spletzer, 1997, p. 426).

Mercedes Garcia-Escribano further elaborates on the transitory shocks to husbands' earnings (Garcia-Escribano, 2004). Using data from the Panel Study of Income Dynamics, the author finds that the smoothing of family income loss resulting from the wives' labour response is larger for

households with limited access to credit. The latter results is consistent for both labour force participation of married women as well as the hours of work (Garcia-Escribano, 2004, p. 1). The paper investigates the added worker effect theoretically and empirically. It also examines the fraction of the husband's earnings shock absorbed via changes in the spouses labour supply. Finally, the author also examines if the latter is driven by the income effect or by substitution effect. The author hypothesised that the wife's labour supply is expected to be less responsive to husband's earnings shocks over a small differencing interval for several reasons (Garcia-Escribano, 2004, p. 13). First, changing the labour force status requires spending some time searching for a job. Second, the hours worked are more flexible in the medium-term rather than short-term. Third, longer periods might be associated with changes in living standards. Thus, it can be argued that spousal labour force supply changes are driven by household changes rather than by sudden shocks to husbands' earnings.

The author splits the sample into two groups: those families with "limited credit access" and those with "access to credit" (Garcia-Escribano, 2004, p. 14). As the results showed, during the 1980s, for the overall US population, the shock of the husbands' earnings had an effect on the spousal labour supply. The existence of the added worker effect was supported and the wives' labour contributed to smoothing a fraction of the husbands' earnings shocks. Next, the author also examined whether the spousal labour supply was driven by the substitutability between the leisure of the husband and the wife, or by the temporal drop in family income (Garcia-Escribano, 2004, p. 21). The results supported that the temporal drop in income due to credit constraints, was a major factor driving the wife's labour response to the husband's earnings shocks (Garcia-Escribano, 2004, p. 23). Furthermore, the spousal labour response for the households with limited credit access was not driven by specific lack of access to transfer benefits to this group of households (Garcia-Escribano, 2004, p. 24). Thereby, the income effect was supported as the major driving force of the added worker effect. However, the substitution effect between the leisure of the husband and the wife was also not ruled out, although the temporal family income change that was exclusive of the wife's earnings and triggered by borrowing constraints was dominating (Garcia-Escribano, 2004, p. 25). As an important implication, the author concludes that there is a higher spousal labour response in economies where salaries are the main source of household income and where the transfer systems are less reliable as distributive income mechanisms, holding constant the cultural factors which might affect the wife's labour supply (Garcia-Escribano, 2004, p. 26).

Melvin Stephens Jr. elaborates more on the added worker effect, particularly in the periods before and after the husband's job displacement, in his paper called "Worker Displacement and the Added Worker Effect" (Stephens, 2001). The author defines the added worker effect as the effect of a husband's job loss on the labour supply of the wife, particularly an increase in married women's labour supply in response to their husbands' unemployment spells (Stephens, 2001, p. 1). Stephens argues that there are different types of unemployed people and if all of them are treated the same way while measuring the AWE the results would likely be understated. According to the author, those people who quit or are seasonal workers would not have their earnings adversely affected, whereas disposed workers would. Moreover, the disposed workers' unemployment may call for changes in the spouses' labour supply (Stephens, 2001, p. 2). Furthermore, Stephens argues that the previous literature ignored the wives' labour supply responses before and after the husbands' job loss. According to the author's hypothesis, if the family perceives an increase in the likelihood of the husband's displacement, then the wife's work effort should also increase prior to the displacement. On the other hand, when the displacement occurs, the reduction in permanent family income should increase the wife's labour supply in subsequent years. The latter assumptions, if proved to be correct, could have an important impact on the consumption smoothing that families undertake and thus, on the added worker effect as well (Stephens, 2001, p. 3). According to Stephens's framework, a husband's job loss will result in a permanent increase in his wife's work effort following his displacement. The latter framework is based on the family life cycle labour supply model.

Stephens used the first 25 waves (1968-1992) of the Panel Study of Income Dynamics (PSID) and the sample was restricted to married women and men aged 25-65 (Stephens, 2001, p. 12). Stephens's results of the descriptive analysis of the wives' work effort before and after displacement showed that their employment rate increases in the years leading up to and including the year of displacement (Stephens, 2001, p. 15). The latter was consistent with the theoretical assumptions made about response patterns; some families adjust their response before the displacement occurs, while others do it at the time of the job loss. Most importantly, Stephens finds that in the years prior to displacement, only modest changes are recorded in the wives' work effort increase, while the husbands experience some unemployment (Stephens, 2001, p. 16). In the year of displacement, unemployment more than doubles, however the change in the wives' labour supply is even smaller than the total change found in years leading up to displacement. As

the unemployment rate of husbands falls immediately after the year of displacement, wives' work effort continues to increase. According to Stephens, the latter results illustrate why previous added worker effect studies have found little evidence of a response.

Finally, large and persistent post-displacement increases in the wives' labour supply as a response to the husbands' displacement were found. Moreover, the increased work effort of wives was offsetting over 25% of their husbands' earning losses (Stephens, 2001, p. 2, 3). Thus, wives earnings did provide a source of long-run income smoothing for displaced families (Stephens, 2001, p. 26).

Another article that proved the added worker effect is called "Family Job Search and Wealth: The Added Worker Effect Revisited" by J. Ignacio Garcia-Perez and Silvio Rendon (Garcia-Perez & Rendon, 2018). The authors concentrate their analysis on the effect of the wealth and savings on the added worker effect, particularly on the job finding rates of the spouse. According to the authors, the wealth and savings in the family, which have been excluded from the previous studies, underestimates the interconnection between individual job search processes (Garcia-Perez & Rendon, 2018, p. 2). The latter, in its turn, would result in neglecting the added worker effect.

The model that the authors use assumes that the labour market environments of the household members are unconnected, however wealth and consumption are common to the household (Garcia-Perez & Rendon, 2018, p. 3). Thus, the employment decisions of the spouses are interlinked and the employed partner's income supports the other family members' selectivity in accepting a job. At the same time, the authors argue that when a partner becomes unemployed, the spouse cannot afford to be so selective and has to accept lower wage offers. The latter assumption increases the probability of the added worker effect. The authors used data from Survey of Income Program Participation (SIPP), which contains employment transitions, wages and wealth of individuals in the US from 1966 to 2010 including. The SIPP is based on a continuous series of national panels, with a sample size of approximately 36,700 interviewed households (Garcia-Perez & Rendon, 2018, p. 12). The authors used the panel covering the period from 1996-1999. Next, as they were interested in the households with only two members present, they restricted the sample to married couples aged between 26 and 50 without children or having only one child. Thus, the final sample size was 33,305 observations. The individuals were

categorized either employed or unemployed. From the 1069 households, only in 4.2% the husband was unemployed and the wife employed (Garcia-Perez & Rendon, 2018, p. 13). Moreover, the wealth accumulation was mainly dependent on the husband working than on the wife working.

According to the results obtained, for the wife, job finding was the highest when the employed husband separated from his job (Garcia-Perez & Rendon, 2018, p. 15). The latter evidence supported that job finding is triggered by job separation, especially for the wives, meaning that an added worker effect was found. Next, the authors conduct three regime changes (Garcia-Perez & Rendon, 2018, p. 22). First, they worsened each household member's labour market, which aimed to evaluate whether the spouse increased his or her labour market activity once the partner became unemployed. Particularly, the authors increased the layoff rates by 1 percentage point in the first regime change. The second regime change entailed increasing the debt limit by increasing the tightness of the borrowing constraint by 5%. This way, the authors were evaluating the effect of access to credit on the family job search. Finally, the third regime change consisted of increasing the unemployment transfers of each spouse by \$100 at a time and then increasing for both spouses simultaneously by \$50.

The results of the first regime change showed that worsening a spouse's labour market increased his unemployment but decreased it for the partner (Garcia-Perez & Rendon, 2018, p. 23). The latter indicated a clear added worker effect; an agent became more active in the labour market when the labour market conditions worsened for the spouse. The authors also point out that an economic downturn increases an agent's unemployment and undermines support for the partner's reservation wage. Thus, the agent becomes more likely to accept a job. The second regime change, which was increasing the debt limit, increased the wife's unemployment rate and her leisure consumption. Finally, the third regime change, which was increasing the unemployment transfers increased the unemployment and wages of the beneficiary spouse but decreased them for the non-receiving spouse. Additionally, the last regime change decreased wealth holding because it relaxed the borrowing constraints.

Next, the authors excluded the wealth and savings from the analysis, which implied understating the interdependence between household members' job search (Garcia-Perez & Rendon, 2018, p. 25). Moreover, because the wealth data enable the identification of leisure parameters, their

omission was neglecting the added worker effect. Finally, the authors also test the results in the families with more than 1 children (Garcia-Perez & Rendon, 2018, p. 26). The presence of more children eroded the interdependency of the individual job search process in the household. The added worker effect increased for the wives with the number of children increasing (Garcia-Perez & Rendon, 2018, p. 27).



## 2.4 The Added Worker Effect in Italy

In the paper called “Gender Differences in Labor Force Participation Rates in Spain and Italy under the Great Recession” the authors analyse different effects on the labour market and particularly on the labour force participation of women and men (Addabbo, Tindara & Rodríguez-Modroño, Paula & Galvez, Lina, 2015, p. 23). Specifically, they analyse the effects of the financial and economic crisis that started in 2007 and those of the austerity policies of 2010. According to the authors, the economically active population ratio can be decomposed into a trend and a cyclical component. The cyclical component can have a negative or a positive sign depending on whether there is an added worker effect (AWE) or a discouraged worker effect (DWE). The authors define the two latter concepts in the following way: the added worker effect is when labour supply behavior is counter-cyclical because it implies an increase in a person’s labour supply, meaning hours worked or participation, in response to transitory shocks in the partner’s earnings. Whereas, the discouraged worker effect is pro-cyclical, when potential workers renounce finding a job and they leave the labour force because they estimate their chances of finding a job too small in the presence of high unemployment rates.

Italy is among the mediterranean countries that have the pervasiveness of the male-breadwinner model acting as strong barriers for female participation in the labour market (Addabbo, Tindara & Rodríguez-Modroño, Paula & Galvez, Lina, 2015, p. 23, 24). It was also hit by the financial and economic crisis and a sovereign debt crisis since the end of 2009.

The labour supply models were estimated using EU SILC 2011 micro data by gender interpreting the impact of partner’s employment status while controlling for socio-demographic structure of the household before and during the crisis (Addabbo, Tindara & Rodríguez-Modroño, Paula & Galvez, Lina, 2015, p. 24). Individual and family characteristics such as income, age, educational level, children, household’s indebtedness, regional differences in unemployment rates and availability of childcare services were also taken into account. The authors hypothesized that the Great Recession was characterized by an AWE for women because of occupational segregation, strong loss of male jobs compared to women, female educational gains, improved positions of women in the labour market before the crisis and the shift to dual-earning couples (Addabbo, Tindara & Rodríguez-Modroño, Paula & Galvez, Lina, 2015, p. 26).

The authors found an added worker effect in Italy; women were increasing their participation in the labour force and decreasing their inactivity in 2012 (Addabbo, Tindara & Rodríguez-Modroño, Paula & Galvez, Lina, 2015, p. 27). However, also an increase in discouragement in active search of employment was found, especially for women in the South of Italy. Those women were inactive but stated that they were available for work and did not actively search or were not immediately available. The authors also found a strong increase in the female employment in less qualified jobs; it increased at a 24.9% rate from 2008 to 2012 and more than tripled in Service and Trade Sectors (Addabbo, Tindara & Rodríguez-Modroño, Paula & Galvez, Lina, 2015, p. 29).

The authors concluded that though women's labour force participation has increased to sustain the lack of household's income, still women living in areas characterized by a higher level of women's unemployment were discouraged in their labour supply (Addabbo, Tindara & Rodríguez-Modroño, Paula & Galvez, Lina, 2015, p. 31). Moreover, the women's labour supply was found to be positively related to their level of education, according to the literature on the AWE. Furthermore, the labour supply of married women was decreasing with the presence of children. Only 14% of children aged less than 3 years old had access to public kindergarten in 2010, compared to much less coverage in South of Italy being only 5%. On the other hand, the presence of children aged 11 to 14 decreased the Italian mothers' labour supply by 13%.

In another article called "Participation of married women in the European labor markets and the "added worker effect"", the authors test the existence of the added worker effect in 11 European countries, including Italy (Prieto-Rodríguez & Rodríguez-Gutiérrez, 2003, p. 429). The data from European Community Household Panel corresponding to the years 1994-1996 was used. Besides including the variables capturing the personal and family characteristics, non-labour income of married women as well as some characteristics of the labour market were also taken into account (Prieto-Rodríguez & Rodríguez-Gutiérrez, 2003, p. 432). Two transitions in the labour market were considered for the husbands: transition from work to work and from work to inactivity or unemployment. Consequently, the latter transitions could generate two different responses among women: remaining inactive or going from inactivity to activity, namely either work or unemployment (Prieto-Rodríguez & Rodríguez-Gutiérrez, 2003, p. 433).

One of the first results found suggested that when a woman was inactive and her husband remained occupied, it was very likely that also the woman would remain inactive (Prieto-Rodríguez & Rodríguez-Gutiérrez, 2003, p. 435), (See Figure 13). On the other hand, when a woman was inactive and her husband became unemployed or inactive, the percentage of women that remained inactive was lower than in the previous case mentioned above. Thus, the authors conclude that there was a weak evidence of the added worker effect, as married women reacted by working or by seeking work when their husbands lost their jobs. However, the job seeking process was not very successful, as in most cases the percentage of women that were moving from inactivity to unemployment was high.

Table 3  
Inactive married women's transitions conditioned to their husbands' transitions (percentages)

	Husband-work to work			Husband-work to unemployment or inactivity			Total number of transitions
	Woman-remain inactive	Woman-inactivity to work	Woman-inactivity to unemployment	Woman-remain inactive	Woman-inactivity to work	Woman-inactivity to unemployment	
Belgium	85.0	8.9	6.1	100.0	–	–	427
Denmark	68.9	14.3	16.8	66.6	11.1	22.3	170
France	87.9	8.9	3.2	81.2	6.2	12.6	1066
Germany	90.2	7.5	2.3	80.1	6.6	13.3	1228
Great Britain	83.6	14.9	1.5	85.7	14.3	–	626
Greece	85.7	4.9	9.4	80.7	8.8	10.5	1145
Ireland	93.6	5.4	1.0	93.0	4.2	2.8	1030
Italy	92.0	4.4	3.6	84.8	5.5	9.7	2319
Holland	73.6	7.7	18.7	58.4	33.3	8.3	1107
Portugal	86.9	7.5	5.4	96.7	3.2	–	1008
Spain	90.8	4.0	5.2	81.8	5.8	12.4	2256

Figure 13 - The transitions of married women in the labour market when the husbands transition from work to work or from work to either unemployment or inactivity, expressed in percentages - “Participation of married women in the European labor markets and the “added worker effect” (Prieto-Rodríguez & Rodríguez-Gutiérrez, 2003, p. 434)

Next, the authors also computed the average number of years that women remained inactive for each category of husbands' labour force transitions (See Figure 14). When the husbands were transitioning from work to work, the average periods of inactivity of married women were longer than in the case when the husbands were transitioning from work to inactivity or unemployment (Prieto-Rodríguez & Rodríguez-Gutiérrez, 2003, p. 43, 436).

Table 4  
**Married women's average inactivity period (years)**

	Woman-remain inactive	
	Husband-work to work	Husband-work to unemployment or inactivity
Belgium	6.67	–
Denmark	3.22	2.99
France	8.26	5.32
Germany	10.20	5.03
Great Britain	6.10	6.99
Greece	6.99	5.18
Ireland	15.63	14.29
<b>Italy</b>	<b>12.5</b>	<b>6.58</b>
Holland	3.79	2.40
Portugal	7.63	30.30
Spain	10.87	5.49

Figure 14 - The average inactivity periods of married women when the husbands transition from work to work or from work to either unemployment or inactivity, expressed in years - “Participation of married women in the European labor markets and the “added worker effect” (Prieto-Rodríguez & Rodríguez-Gutiérrez, 2003, p. 435)

After finding the weak evidence of the AWE the authors applied several variables that could affect the labour force participation of married women. In particular, they applied the predicted or potential wage of married women (Prieto-Rodríguez & Rodríguez-Gutiérrez, 2003, p. 436). Moreover, they controlled for such variables as education, potential experience and number of years of unemployment over previous years. According to the final results, the added worker effect was found in Italy. Married women were reacting to the labour force transitions of their husbands till they were fifty-eight years old (Prieto-Rodríguez & Rodríguez-Gutiérrez, 2003, p. 445). Thus, the Italian women were fulfilling the AWE hypothesis over almost all their active lives and they were adopting a “secondary” role in the family labour market participation. By the latter, the authors mean that married women who were previously inactive in the labour market, decide to temporarily participate in it as a response to the loss of jobs of their husbands (Prieto-Rodríguez & Rodríguez-Gutiérrez, 2003, p. 430).

In another paper called “Can the Crisis be an Opportunity for Women?” the authors investigate whether the AWE or the DWE dominates in Italy (Ghignoni & Verashchagina, 2014, p. 258).

The added worker effect is defined as when female partners may enter the labour force in order to compensate for the loss of family income. Whereas the discouraged worker effect is when female partners remain inactive, since they believe no work is available during a crisis. The authors pointed out that Italy is a country with a “familistic society”. Although the earlier evidence suggested that the added worker effect was prevailing in developing countries, Italy being a developed country showed some common characteristics with them. First, there is the traditional distinction between the breadwinner and the caregivers. Second, is the absence of unemployment benefits which would allow smoothing consumption in times of crisis. The authors hypothesise that based on the latter characteristics, Italy might have shown the AWE during a crisis and they try to investigate it. They use three consecutive waves of the Bank of Italy Survey on Household Income and Wealth in 2006, 2008 and 2010.

At the time of the study, Italy had one of the lowest female labour force participation rates in Europe (Ghignoni & Verashchagina, 2014, p. 260). However, before the crisis there was already an increasing number of women getting into work. The latter shift was due to advancement of women in educational attainments. Since 2005 and until the crisis the number of active women participating in the labour force has been on the rise (Ghignoni & Verashchagina, 2014, p. 261). Moreover, from 2010 to 2011, the number of employed and unemployed women increased, while the inactivity started to decline. The two latter trends suggest an added worker effect. However, at the start of the crisis, the share of discouraged workers in Italy was two to three times higher than the EU average. Moreover, the discouraged worker effect had a tendency to rise over the crisis and it reached a high 5.3% in the working age female population. More specifically, the authors found that the DWE prevailed in the North of Italy (Ghignoni & Verashchagina, 2014, p. 264). It manifested in 2008 for low-educated women and in 2010 for high educated women. However, in the South of Italy, an added worker effect was found, especially for low-educated women.

In their analysis, the authors controlled for such variables as age, years of education, presence of minor children, presence of elderly and the availability of childcare services in the region (Ghignoni & Verashchagina, 2014, p. 264). The effect of age remained positive and significant throughout the years meaning that younger women tend to participate less in the labour market. Years of education had a strong positive effect on female labour force participation (Ghignoni & Verashchagina, 2014, p. 265). The presence of young children aged from 0 to 6 years old had a

strong negative effect on participation, compensated by the availability of child-care services in the North, especially for highly educated women. Whereas in the South, childcare services do not play any positive role because traditionally, women rely more on the help from grandmothers.

As the crisis progressed, the lower income of the husbands increased female labour force participation both in the North and in the South of Italy (Ghignoni & Verashchagina, 2014, p. 265). The latter supported the existence of the added worker effect and for the North of Italy, it was significant especially for highly educated women. The authors conclude that if the working conditions for women do not improve, then the AWE most probably will be a temporary shift with no significant impact on female labour force participation post-crisis (Ghignoni & Verashchagina, 2014, p. 267).

Andrea Morone and Francesco Nemore have also conducted an analysis of the added worker effect in Italy in their article called “Unemployment and Labour Force Participation in Italy” (Morone & Nemore, 2020). According to the authors, the labour supply response to a demand-induced fall in employment can produce two effects: the added worker effect and the discouraged worker effect. The added workers may appear “forcefully” in the job market to smooth out fluctuations in family income when the family breadwinner becomes unemployed (Morone & Nemore, 2020, p. 2). On the other hand, there are also the discouraged workers who leave the labour force or refrain from joining it because of lower wages or more expensive job searches. The authors also point out the characteristics mentioned above about Italy being a country with traditional divisions between breadwinners and caregivers. Moreover, poor social insurance programs and the absence of unemployment benefits are unable to compensate family income losses. Thus, reduced incomes can force more than usual percentages of married women to enter the labour force to increase family income.

The authors used seasonally-adjusted quarterly data on unemployment and labour force participation rates in ISTAT, for workers aged 16-64 in Italy over the sample period from January 1998 to July 2019 (Morone & Nemore, 2020, p. 2). According to the results, women tend to enter the labour market to a greater extent than men, to compensate for income reductions induced by the unemployment of the breadwinner (Morone & Nemore, 2020, p. 4). Thus, the authors find a persistent added worker effect in Italy.

Another paper that used data from the Labor Force Survey in Italy is called “The Added Worker Effect for Married Women in Italy” by Francesco Franceschi (Franceschi, 2014, p. 214). The author first mentions the poor performance of the Italian economy in 2008, 2011 and the period of 2012 to 2013. Increased unemployment as well as increased female labour force participation was recorded in Italy during the periods mentioned. Franceschi assumed that the increase in the female labour force participation may be attributed to the added worker effect, which he defines as the increase in labour supply of married women due to their husbands’ job loss.

Franceschi measured the wife’s probability of joining the labour force and the probability of the wife becoming employed influenced by her husband’s job loss. Moreover, the author also measured whether the husband’s reverse transition from unemployment to employment increased the wife’s probability of leaving the labour force (Franceschi, 2014, p. 215). The labour force survey dataset provided information on the reason of husband’s job loss, which allowed to identify the expected job losses and those associated with income loss. When the husband’s job loss is anticipated, significant changes in the wife’s behaviour can’t be expected (Franceschi, 2014, p. 216). On the other hand, when the husband’s job loss is associated with a small income loss, any significant response from the wife’s part shouldn't be expected as well.

The author also points out that the empirical evidence about the added worker effect in the literature was mixed. Some of the studies such as those done by Mincer, Heckman and MaCurdy also mentioned in this paper, found very little evidence, while more recent studies found significant AWE when analysing the husbands’ actual transition from employment to unemployment in USA, Australia and Canada (Franceschi, 2014, p. 218).

Franceschi restricted the dataset to married individuals and by selecting all the quarters from 2004 to 2013 from the Italian labour force survey, he obtained 1,050,000 married couples (Franceschi, 2014, p. 219). The author estimates the added worker effect according to two definitions; the first one is the increase in the transition probability of married women from “non-employment” to “employment” whose husbands experienced job loss. The second definition describes the added worker effect as the increase in the probability of participating in the labour force of inactive women if the husbands lost their jobs. In other words, participating in the labour force is defined as moving from being inactive to employed or unemployed (Franceschi, 2014, p. 220). Furthermore, according to the definition of unemployment in Italy, an individual is

considered statistically unemployed in four conditions: a) he is jobless, b) he states that he wants to work, c) he did active job search during 4 weeks before the interview and d) he is willing to start working within 2 weeks from a job offer. Franceschi constructs the model in a way that requires only the first two above-mentioned conditions being met for considering the individuals unemployed; otherwise, the number of actually unemployed people is significantly underestimated as some of the officially inactive people behave in a very similar way as those counted unemployed in their transitions between labour market states (Franceschi, 2014, p. 221). Because the Italian labour force survey provides the opportunity to clearly identify those officially unemployed as well as those who would like to work but have not made any active job search during the 4 weeks before the interview, the author solves the mistake of overestimation of the unemployment made in the previous literature.

The author uses a counterfactual in order to show the empirical existence of the AWE in Italy. For the latter purpose, he chooses the sample of married women whose husbands did not lose their jobs (Franceschi, 2014, p. 221). Thus, he constructed the model as a logistic regression of the wife's transition probability by including dummy variables to show if the wife works or is unemployed when her husband experienced a job loss. Moreover, the author takes into account wives' and husbands' personal characteristics and controls for 4 different reasons of why the husband lost his job (retirement, family reasons, dismissal and health problems). The latter distinction between the husband's job loss reasons is done to capture the extent of the anticipation; if the job loss is expected or anticipated, it may produce little response, consequently insignificant AWE (Franceschi, 2014, p. 222). Thereby, Franceschi assumes that retirement and job loss because of family reasons are anticipated, whereas the dismissal and quitting the job because of health reasons are less anticipated. Finally, the author also estimates the wife's response when her husband finds a job (Franceschi, 2014, p. 223). In other words, he measures the wife's transition probability from the active state to inactive when her husband transitions from unemployment or non-employment to employment.

According to the results obtained by the analysis, the author's hypotheses that in case of anticipated transitions from employment to non-employment the AWE was very small and statistically insignificant was confirmed (Franceschi, 2014, p. 224). Namely, when the husband retired or stopped working for family reasons, there was no response in terms of the wife's labour supply. On the other hand, when the husband was laid off, a significant increase in the wife's



transition probability from non-employment to employment was found to be 2.1% points. Moreover, when the husband quit his job for health reasons, the increase of the wife's probability of becoming employed was 2.3% points. Furthermore, Franceschi also found that the higher the wife's education the higher the probability of her becoming employed. The presence of children in the household, on the other hand, reduced the wife's probability of finding a job (Franceschi, 2014, p. 225). The probability of the transition was also found to be higher in Northern regions. An added worker effect was found as before the financial crisis (2004-2008), as well as during the crisis (2009-2013), being significantly larger in the latter case. Finally, the author also finds that active wives whose husbands got a job are not more likely to leave the labour force compared to the wives whose husbands did not find a job, at least in the short-run (during 12 months), (Franceschi, 2014, p. 226).

## 3 Statistical data analysis

### 3.1 Data

The cross-sectional data used in this paper is taken from the Italian Labour Force Survey (LFS), the last quarters of 2009 and 2018.

- Italian Labor Force Survey (LFS)

The Italian Labor Force Survey (LFS) is the main source of statistical information on the Italian labour market on which official estimates of employment and unemployment are calculated (ISTAT, 2018). It is implemented by the National Institute of Statistics (ISTAT) since 1959 (Peracchi & Viviano, 2001, p. 7). Furthermore, other information about occupation, the sector of economic activity, hours worked, training, contracts' type and duration can be obtained from the survey. Most importantly, the survey also provides information for analysing the growth of female participation in the Italian labour market, thus giving insights on the trends and changes of the population's labour force participation.

- Survey design

The Italian LFS follows a rotating sample design where households participate for two consecutive quarters, after which they temporarily exit for the two consecutive quarters and re-enter in the two remaining consecutive quarters (ISTAT, 2018). Due to the rotating scheme, 50% of the households interviewed in a quarter are re-interviewed after 3 months, 50% after 12 months and 25% after 9 and 15 months. Thus, by matching all the members of the households interviewed in different time periods, longitudinal data can be obtained.

The interviews are conducted by the National Statistics Office (Istat) continuously in every week of the year. The respondents are individuals above the age of 15 and the sample of interest consists of 70,000 households with 125,000 individuals each quarter (Franceschi, 2014, p. 219). The survey has undergone some changes in 2004 concerning the technique, the methodology and the data analysis. Since that change, the survey has become continuous and matching with Eurostat Standards ("Labour force survey – cross-sectional quarterly data: File for research purposes," 2018, p. 23-25).

The data collection mode for the survey includes Computer-Assisted Telephone Interviewing (CATI) and Computer-Assisted Personal Interviewing (CAPI). Following a two-step sampling design, the first-stage sample is the geographical unit or municipalities and the second-stage consists of randomly selecting the households within the municipalities (ISTAT, 2018). Municipalities are stratified by population size (Peracchi & Viviano, 2001, p. 6). As a general rule, municipalities with a population above a certain threshold (also called self-representative municipalities) are always included in the sample, whereas the smaller ones are selected at random. The households are made up either of persons living alone or of two or more persons, whether or not of the same family, usually living in the same dwelling and with family (marriage, relationships, adoption, guardianship) or affection ties (Eurostat, 2012, p. 23). Non-resident households, people not living in private households and household members emigrated abroad or absent from the selected household for more than one year are not covered.

The sampling frame is the population register. Although there is no legal enforcement, the response is compulsory and the response rate is usually high, above 80%. In 2010, refusals accounted for approximately 33.3% of the total non-response and 14.6% of the interviews of persons aged 15-74 years were proxy (Eurostat, 2012, p. 24). One of the main limitations of the survey is that it provides no information on individual incomes and wealth holdings (Peracchi & Viviano, 2001, p. 7).

Some of the major changes in the survey in recent years include:

- In 2006: Changes to the questionnaire to take into account the legal suppression of compulsory military or community service and to fully tie in with the EU-LFS definition of unemployment (Eurostat, 2012, p. 25).
- In 2008: From the first quarter 2008, people aged 15 are considered as out of the labour force, to take into account a change in the national legislation which increased the number of years of compulsory education. Employment and activity rates are still computed with reference to the working age population 15-64 to keep the comparability. As very few 15-year-olds are employed or unemployed, the impact on time-series is negligible (Eurostat, 2012, p. 25).

- In 2009: Small changes, in particular in the question wording of some national variables (Eurostat, 2012, p. 25).
- In 2010: From the third quarter of 2010, personal interviews (CAPI) are carried out in households of foreign people and in households with no telephone, whereas CATI interviews are conducted in all other cases (Eurostat, 2012, p. 25).

The questionnaire is divided into 11 sections (ISTAT, 2018). The 9 primary sections are described in this paper. The questionnaire starts with the *general datasheet* that collects sociodemographic information from all of the family members such as the age, gender, citizenship of the respondents and the number of people living in the household. Then *section A* asks several questions such as the name, surname, phone number of the respondents, the survey date and the principal reason why a respondent wouldn't answer the questions himself or herself. The *second section B* is only for individuals aged 15 or above and it concentrates on the employment status during the interview's week, including questions about the type of work, hours worked, motivation about the unemployment status and the type of contract. The *third section C*, is only for employed individuals and concerns the main employment activity. It covers the position in the profession, the industry, the company, if the work is part-time or full-time, working and overtime hours, shift work, job transfer and salary. The *fourth section D* concerns the secondary employment (if any). The next *section E* provides information about the previous work experience and the *section F* deals with job search, such as the reasons for seeking a job, the channels used for the job search, the type of work searched for and the actions taken for it. *Section G* concerns the information about the employment agencies and how they are used by the respondents. The *eighth section H* deals with education and training that the respondents are undergoing. Finally, the *ninth section I* asks the respondents about their auto-perception about their employment status and their residence, compared to the previous year (See Figure 15 below).

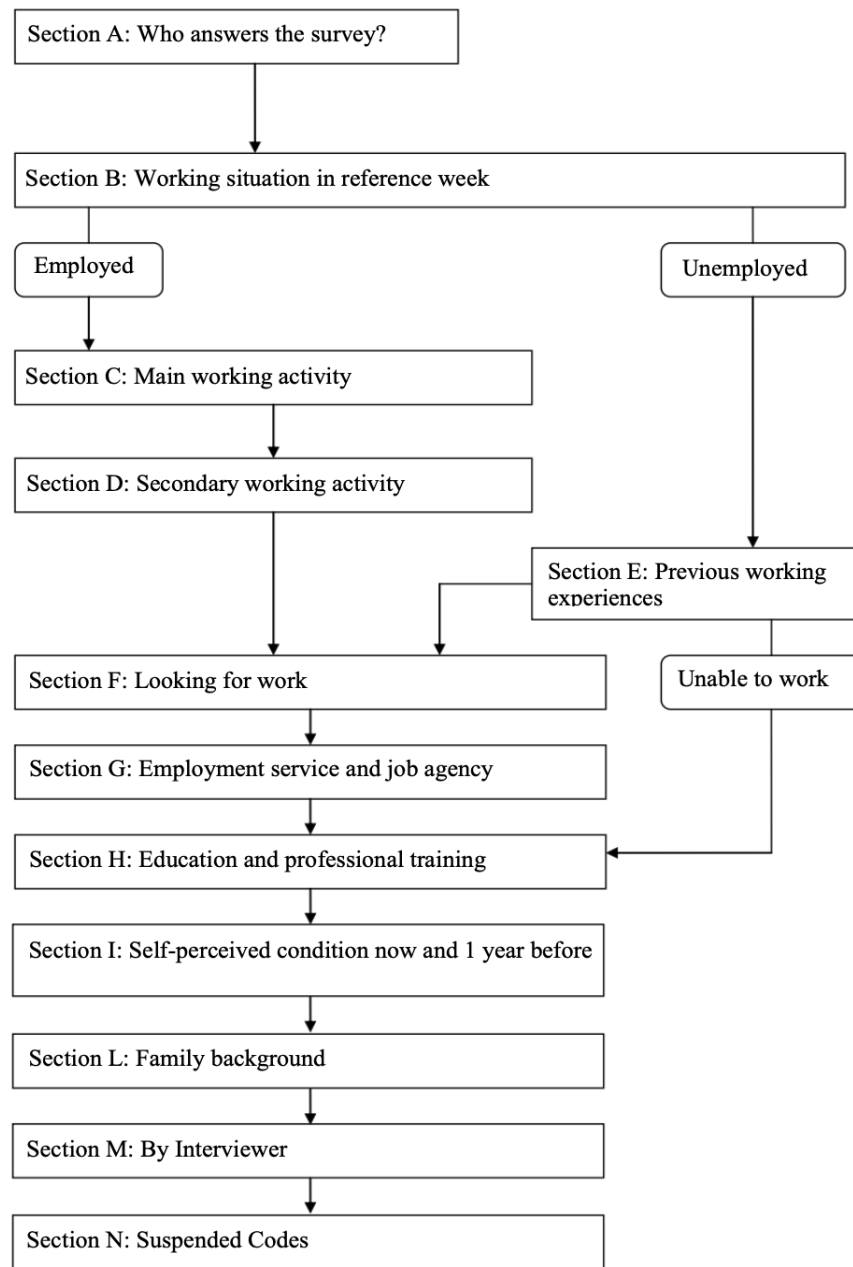


Figure 15 - The structure of the Italian Labor Force Survey Questionnaire - “Labor Force Survey, Questionnaire (MFR version)” (ISTAT, 2018)

## 3.2 Analysis Strategy

By the example of Franceschi's model mentioned in the Literature Review above, the analysis will be conducted based on a Logistic Regression where the dependent dummy variable equal to 1 will be the case when the married women are employed in time  $t$  and consequently, it will be equal to 0 when they are unemployed (Franceschi, 2014, p. 221). Another two dummy variables will be used indicating whether the husbands are employed or unemployed at the time  $t-1$  and at time  $t$ . Thus, the model will capture the probability of married women being employed or not, conditional to the working condition of their husbands in  $t$  and  $t-1$ . The case when the husband was not unemployed at time  $t-1$  while the wife is employed at time  $t$ , is the counterfactual situation taken as a reference needed for estimating the added worker effect. The time lag between  $t-1$  and  $t$ , in this case, given the data used is 12 months.

Some control variables such as individual characteristics of women will also be used in the model, including educational level and some demographic characteristics such as age, citizenship, geographical area and the number of children.

- Variables<sup>5</sup>

### ***Dependent Variable***

- *Employment condition of women in time t: Variable used is COND3 transformed in a dichotomous variable "employed", "unemployed"*

### ***Explanatory Variables***

- *Employment condition of husbands: COND3 is used for employment condition of the husbands in time t and the variable I5 for the employment condition 12 months before*
- *Employment type for both wives and husbands: Variable used is POSPRO*
- *Education of women: Reference category is compulsory education, variable used is EDULEV or HATLEV*

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<sup>5</sup> The names of the variables mentioned below are the original names taken from the ISTAT Questionnaires.

### ***Demographic Characteristics***

- *Gender: Dummy equals to 1 for males, the variable used is SG11*
- *Age: Variable used is CLETAS, is classified in 5 years intervals*
- *Citizenship: Reference category is the “Italian citizens”, the variable used is CITTAD*
- *The number of children: Reference category is 0 children*
- *Geographical area: Reference category is the “North”, the variable used is RIP3*

### 3.3 Descriptive Statistics

- Sample of 2018

Restricting the sample of the last quarter of 2018 cross-sectional data of 144,292 observations to couples with and without children excluding other cohabitants and after dropping the households with components aged 60 and above yields a sample of 60,234 observations in total. The analysis for this paper will be conducted on the latter restricted sample as the main interest to observe is the labour force participation of married women conditional on various factors such as education, age, geographical area, industry and characteristics of the husbands. In total 21 variables were chosen.

Table 1

Descriptive Statistics for the households of the restricted sample of 2018

<i>2018</i>	<i>Household</i>
<b><i>Geographical area</i></b>	
<i>North</i>	47.64%
<i>Center</i>	17.90%
<i>South and Islands</i>	34.46%
<i>Total</i>	100.00%
<b><i>Number of children</i></b>	
<i>0</i>	18.56%
<i>1</i>	31.99%
<i>2</i>	39.31%
<i>3 or more</i>	10.13%
<i>Total</i>	100.00%
<b><i>Presence or absence of children</i></b>	



<i>Without children</i>	18.56%
<i>With children</i>	81.44%
<i>Total</i>	100.00%

Table 2

Descriptive Statistics for the married couples of the restricted sample of 2018

<b>2018</b>	<b><i>Head of the family</i></b>	<b><i>Wife</i></b>
<b><i>Education</i></b>		
<i>Primary</i>	42.61%	34.50%
<i>High School</i>	42.82%	43.89%
<i>Higher Education</i>	14.58%	21.61%
<i>Total</i>	100%	100%
<b><i>Employment condition</i></b>		
<i>Employed</i>	86.97%	59.06%
<i>In Search</i>	5.23%	5.60%
<i>Inactive</i>	7.81%	35.35%
<i>Total</i>	100.00%	100.00%
<b><i>Employment type</i></b>		
<i>Manager</i>	6.58%	4.24%
<i>White-collar</i>	21.40%	28.27%
<i>Blue-collar</i>	36.13%	16.57%
<i>Self employed</i>	22.53%	9.41%
<i>Contract Worker</i>	0.33%	0.56%
<i>Total</i>	100.00%	100.00%

<b><i>Citizenship</i></b>		
<i>Italian</i>	89.87%	87.70%
<i>EU</i>	3.33%	4.40%
<i>Non-EU</i>	6.79%	7.90%
<i>Total</i>	100.00%	100.00%
<b><i>Age</i></b>		
<i>15-19</i>	0%	0.03%
<i>20-14</i>	0.14%	0.84%
<i>25-29</i>	1.98%	4.45%
<i>30-34</i>	6.89%	10.82%
<i>35-39</i>	11.91%	15.18%
<i>40-44</i>	16.99%	19.58%
<i>45-49</i>	20.55%	20.88%
<i>50-54</i>	22.11%	19.30%
<i>55-59</i>	19.43%	8.92%
<i>Total</i>	100.00%	100.00%

In total, there are 17,547 households in the restricted dataset. The percentage of married couples without children is 10.8%.

Judging from the descriptive statistics obtained, the highest labour force participation of women in 2018 was in the Northern part of Italy compared to the Center and the South, being 70.6% (See Table 3 below). On the other hand, the unemployment (described as “in search” in Table 3) was the highest in the South, including the islands Sicily and Sardinia compared to the North and to the Center. Most of the married women out of the labour force (described as “inactive” in Table 3) were also found in the South.

Most of the married women who are employed have husbands who are Blue-collar workers compared to those women who have husbands that have other employment types shown in Table 3. Next most employed are women with White-collar husbands and finally self-employed married women (See Table 3). However, in case of the employment type of women, more White-collar women are employed than those who are Blue-collar or self-employed (See Figure 16 below).

Approximately 91.45% of employed married women in the sample have Italian citizenship, next being Non-EU citizens with 4.83% and finally EU-citizen employed married women constituting 3.73%.

The highest number of married women that are employed in the sample of 2018 are those with a secondary level of education, constituting 47.25% compared to those who obtained primary and higher education levels (see Table 3 below). The most women “in search” are those with a primary level of education.

The employment of married women having 1 child or 2 children is the highest compared to those who don't have children or have 3 or more children.

When comparing married women with and without children, the latter category has lower employment; 79.09% of married women are employed that have children versus only 20.91% of married women are employed but don't have children. More married women with children also search for a job compared to those who don't have children (80.55% versus 19.45%).

Table 3

Descriptive Statistics of married women's employment condition for 2018

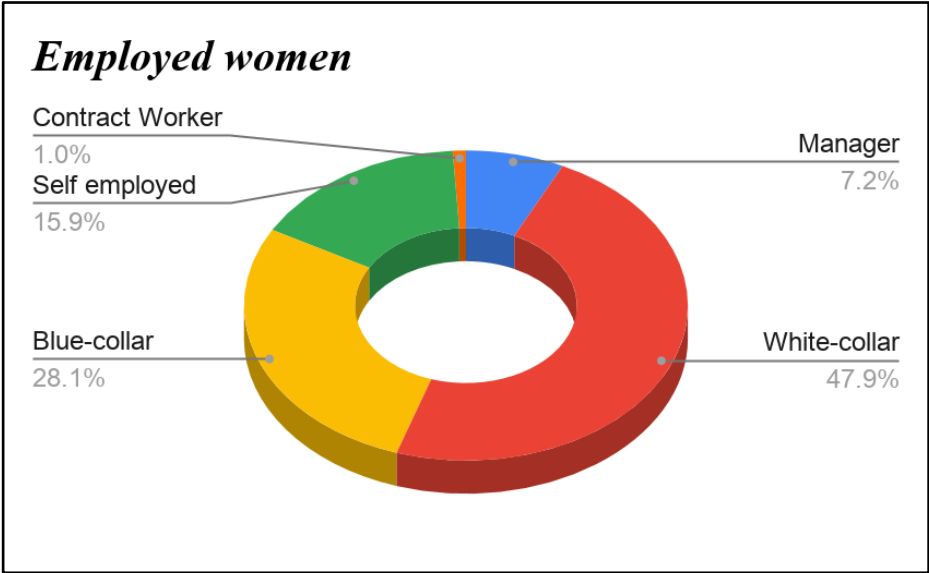
<i>2018</i>	<i>Employed</i>	<i>In Search</i>	<i>Inactive</i>
<b><i>Geographical area</i><sup>6</sup></b>			
<i>North</i>	70.60%	4.89%	24.51%
<i>Center</i>	65.78%	6.02%	28.21%
<i>South and Islands</i>	39.61%	6.35%	54.04%
<b><i>Education</i></b>			
<i>Primary</i>	22.49%	46.13%	52.73%
<i>High School</i>	47.25%	42.26%	38.54%
<i>Higher Education</i>	30.26%	11.61%	8.74%
<i>Total</i>	100.00%	100.00%	100.00%
<b><i>Presence or absence of children</i></b>			
<i>Without children</i>	20.91%	19.45%	14.50%
<i>With children</i>	79.09%	80.55%	85.51%
<i>Total</i>	100.00%	100.00%	100.00%
<b><i>Number of children</i></b>			
<i>0</i>	20.91%	19.45%	14.50%
<i>1</i>	33.51%	32.69%	29.35%
<i>2</i>	38.14%	39.31%	41.28%
<i>3 or more</i>	7.44%	8.55%	14.88%
<i>Total</i>	100.00%	100.00%	100.00%

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<sup>6</sup> The conditional distribution of the geographical area is by row

<b><i>Husband's employment condition</i></b>			
<i>Employed</i>	90.59%	76.78%	82.52%
<i>In Search</i>	3.73%	17.62%	5.76%
<i>Inactive</i>	5.67%	5.60%	11.72%
<i>Total</i>	100.00%	100.00%	100.00%
<b><i>Husband's Empl. condition 12 m.b.</i></b>			
<i>Employed</i>	90.13%	75.36%	81.73%
<i>In Search</i>	7.43%	22.61%	14.75%
<i>Inactive</i>	2.44%	2.04%	3.52%
<i>Total</i>	100.00%	100.00%	100.00%
<b><i>Employment type for men</i></b>			
<i>Manager</i>	8.49%	3.77%	3.82%
<i>White</i>	25.97%	15.99%	14.62%
<i>Blue</i>	31.65%	43.59%	42.42%
<i>Self employed</i>	24.16%	13.04%	21.32%
<i>Contract Worker</i>	0.32%	0.41%	0.34%
<i>Total</i>	100.00%	100.00%	100.00%
<b><i>Citizenship</i></b>			
<i>Italian</i>	91.45%	76.68%	83.17%
<i>EU</i>	3.73%	8.05%	4.95%
<i>Non-EU</i>	4.83%	15.28%	11.88%
<i>Total</i>	100.00%	100.00%	100.00%

Figure 16 - Employed married women in the restricted sample of 2018 based on their employment type



If we look at the employment condition of the husbands 12 months before, particularly when the husband was “in search”, 14.62% of women are employed in 2018 (See Table 5 below). On the other hand, if we look at married women who are employed while their husbands were also employed 12 months before, the percentage is much higher, being 95.23% (See Table 4). Whereas, 90.75% of married women are “inactive” in 2018, while their husbands were employed 12 months before. The latter number doesn’t change much in case when the husbands become unemployed 12 months before; 89.41% of women still remain “inactive”.

Table 4

Employment status of married women in 2018 conditional to their employment status 12 months before while the employment status of their husbands is “employed” one year before

<i>Employment condition of women</i>	<i>Employed</i>	<i>In Search</i>	<i>Inactive</i>
<i>Employed</i>	95.23	23.44	5.14
<i>In Search</i>	1.58	26.82	4.12
<i>Inactive</i>	3.19	49.74	90.75
<i>Total</i>	100.00	100.00	100.00

**Table 5**

Employment status of married women in 2018 conditional to their employment status 12 months before while the employment status of their husbands is “in search” one year before

<i>2018</i>	<i>Employed</i>	<i>In Search</i>	<i>Inactive</i>
<i>Employed</i>	93.19	14.62	2.54
<i>In Search</i>	2.32	31.83	8.05
<i>Inactive</i>	4.50	53.55	89.41
<i>Total</i>	100.00	100.00	100.00

**Table 6**

Employment status of married women in 2018 conditional to their employment status 12 months before while the employment status of their husbands is “inactive” one year before

<i>2018</i>	<i>Employed</i>	<i>In Search</i>	<i>Inactive</i>
<i>Employed</i>	94.98	21.15	7.50
<i>In Search</i>	0.84	23.08	3.00
<i>Inactive</i>	4.18	55.77	89.50
<i>Total</i>	100.00	100.00	100.00

If we compare the transitions from employment conditions of the women between  $t-1$  and  $t$ , conditional to the employment status of the husband 12 month before, we can find interesting evidences. For husbands "employed" 12 months before the percentage of women that enter in the labour market in 2018 (from “inactive” to “employed” or “in search”) is about 9.3%, not much different from the percentage of women with husbands "in search" (10.5%) or inactive (10.5%). Only 14.62% of the women “in search” become employed in the case the husband is in search at  $t-1$ , compared to 21.15% when he is inactive or 23.44% when he is employed. From the simple inspection of these three dimensional tables, it seems that there is no reaction of the women to the unemployment of the husband one year after, i.e. no added work effect. These results should be confirmed by the logistic regression model.

- Sample of 2009

Restricting the sample of the last quarter of 2009 cross-sectional data of 168,655 observations to couples with and without children excluding other cohabitants yields a sample of 81,613 observations in total. As in the previous case with the dataset of 2018, also in this case in total 21 variables were chosen for the analysis.

Table 7

Descriptive Statistics for the households of the restricted sample of 2009

<i>2009</i>	<i>Household</i>
<b><i>Geographical area</i></b>	
<i>North</i>	45.98%
<i>Center</i>	15.33%
<i>South and Islands</i>	38.69%
<i>Total</i>	100.00%
<b><i>Number of children</i></b>	
<i>0</i>	17.87%
<i>1</i>	31.96%
<i>2</i>	39.59%
<i>3 or more</i>	10.58%
<i>Total</i>	100.00%
<b><i>Presence or absence of children</i></b>	
<i>Without children</i>	17.87%
<i>With children</i>	82.13%
<i>Total</i>	100.00%



Table 8

Descriptive Statistics for the married couples of the restricted sample of 2009

<i>2009</i>	<i>Head of the family</i>	<i>Wife</i>
<b><i>Education</i></b>		
<i>Primary</i>	48.62%	43.20%
<i>High School</i>	39.87%	42.67%
<i>Higher Education</i>	11.52%	14.14%
<i>Total</i>	100.00%	100.00%
<b><i>Employment condition</i></b>		
<i>Employed</i>	86.42%	54.96%
<i>In Search</i>	3.79%	4.38%
<i>Inactive</i>	9.79%	40.67%
<i>Total</i>	100.00%	100.00%
<b><i>Employment type</i></b>		
<i>Manager</i>	7.629 %	3.90%
<i>White-collar</i>	20.55%	25.09%
<i>Blue-collar</i>	33.71%	16.11%
<i>Self employed</i>	24.10%	8.91%
<i>Contract Worker</i>	0.44%	0.96%
<i>Total</i>	100.00%	100.00%
<b><i>Citizenship</i></b>		
<i>Italian</i>	91.67%	90.63%
<i>EU</i>	2.32%	2.91%
<i>Non EU</i>	6.01%	6.46%

<i>Total</i>	100.00%	100.00%
<i>Age</i>		
<i>15-19</i>	0.00%	0.08%
<i>20-14</i>	0.25%	1.26%
<i>25-29</i>	2.33%	5.62%
<i>30-34</i>	8.75%	13.59%
<i>35-39</i>	15.34%	18.39%
<i>40-44</i>	19.75%	20.60%
<i>45-49</i>	19.94%	18.99%
<i>50-54</i>	17.39%	15.14%
<i>55-59</i>	16.26%	6.33%
<i>Total</i>	100.00%	100.00%

In total, there are 23,647 households in the restricted dataset. The percentage of married couples without children is 10.36%.

As in the previous case of 2018, in 2009, the majority of employed married women are also from the North compared to the Center and the South, about 66.71% (See Table 9 below). The number of married women “in search” prevails in the Center compared to the North and the South, however, those out of the labour force are more concentrated in the South being 57.54%.

Judging from the restricted sample of 2009, most of the married employed women have a secondary educational level, just as in the case of 2018. On the other hand, the number of married women with higher educational level (university diploma) increases from 21.09% to 30.26% from 2009 to 2018.

The presence of children induces women to work more in 2009 as it was shown also above in case of the year 2018. Thus, married women who have children and are employed constitute 49.94%, while those who don't have children and are employed, constitute 20.59%. Married

women with children are also more actively “in search” for a job compared to those without children.

Compared to 2018, the most employed married women (29.78%) have husbands who were Blue-collar workers also in 2009, however, next most employed are the married women whose husbands were self-employed (25.62%) and only after the women with White-collar husbands (24.15%). As to the employment type of married women, there are more contract workers in 2009 (see Figure 17) compared to 2018. White-collar working women were again the majority in 2009, constituting 45.65%.

In 2009, 93.03% of employed married women were Italian citizens. As in 2018, in 2009 as well the next highest employed category are married women with non-EU citizenship and lastly, are the EU citizens. The employment of married women who are Italian citizens decreases from 2009 to 2018. On the other hand, the employment of married women who are non-EU and EU citizens increases from 2009 to 2018.

**Table 9**

Descriptive Statistics of married women’s employment condition for 2009

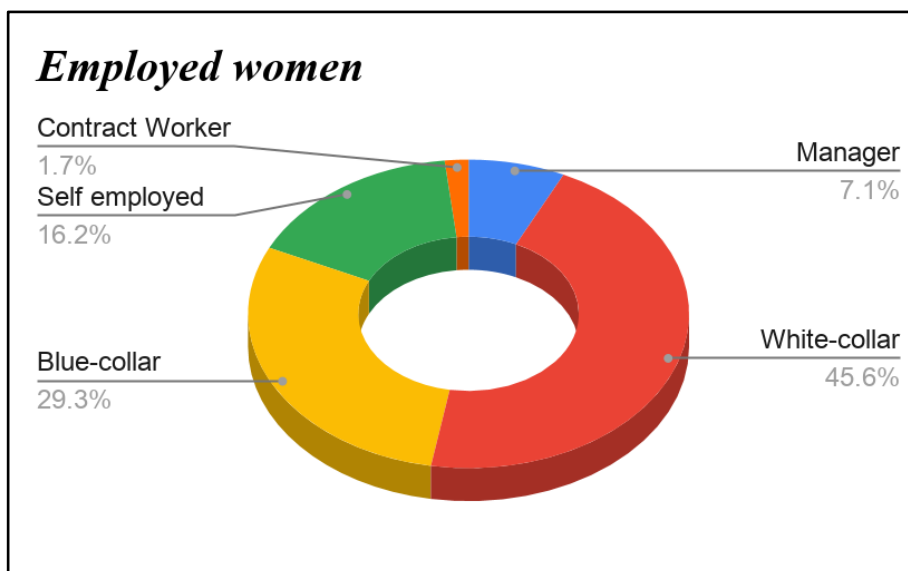
<i>2009</i>	<i>Employed</i>	<i>In Search</i>	<i>Inactive</i>
<b><i>Geographical area</i><sup>7</sup></b>			
<i>North</i>	66.71%	4.03%	29.27%
<i>Center</i>	62.28%	5.46%	32.26%
<i>South and Islands</i>	38.10%	4.36%	57.54%
<b><i>Education</i></b>			
<i>Primary</i>	28.97%	46.86%	62.03%
<i>High School</i>	49.94%	43.48%	32.75%
<i>Higher Education</i>	21.09%	9.66%	5.22%

<sup>7</sup> The conditional distribution of the geographical area is by row

<i>Total</i>	100%	100%	100%
<b><i>Presence or absence of children</i></b>			
<i>Without children</i>	20.59%	20.87%	13.87%
<i>With children</i>	79.41%	79.13%	86.13%
<i>Total</i>	59.06%	5.60%	35.35%
<b><i>Number of children</i></b>			
<i>0</i>	20.59%	20.87%	13.87%
<i>1</i>	33.85%	32.657	29.34%
<i>2</i>	37.96%	36.908	42.08%
<i>3 or more</i>	7.60%	9.57%	14.72%
<i>Total</i>	100%	100%	100%
<b><i>Husband's employment condition</i></b>			
<i>Employed</i>	90.04%	82.13%	81.99%
<i>In Search</i>	3.19%	11.50%	3.78%
<i>Inactive</i>	6.76%	6.38%	14.24%
<i>Total</i>	100.00%	100.00%	100.00%
<b><i>Husband's Empl. condition 12 m.b.</i></b>			
<i>Employed</i>	90.77%	83.77%	82.90%
<i>In Search</i>	5.02%	12.56%	9.55%
<i>Inactive</i>	4.21%	3.67%	7.55%
<i>Total</i>	100.00%	100.00%	100.00%
<b><i>Employment type for men</i></b>			

<i>Manager</i>	9.96%	3.48%	4.93%
<i>White</i>	24.15%	16.72%	16.09%
<i>Blue</i>	29.78%	43.29%	37.99%
<i>Self employed</i>	25.62%	18.16%	22.69%
<i>Contract Worker</i>	0.54%	0.48%	0.29%
<i>Total</i>	100.00%	100.00%	100.00%
<b><i>Citizenship</i></b>			
<i>Italian</i>	93.03%	79.61%	88.57%
<i>EU</i>	2.88%	6.96%	2.53%
<i>Non EU</i>	4.09%	13.43%	8.90%
<i>Total</i>	100.00%	100.00%	100.00%

Figure 17 - Employed married women in the restricted sample of 2009 based on their employment type



In 2009, the employed married women with husbands also being employed 12 months before constitute 94.63% (See Table 10). If we look at the employed married women while their husbands were “in search” 12 months before, we see only 22.03% (See Table 11). The latter number, in fact, is higher than in 2018. While, if we look at married women while their husbands were employed 12 months before, we see 91.46% of them being “inactive”. Furthermore, 92.24% of “inactive” women remain as such even if their husbands were “in search” 12 months before.

**Table 10**

Employment status of married women in 2009 conditional to their employment status 12 months before while the employment status of their husbands is “employed” one year before

<i>2009</i>	<i>Employed</i>	<i>In Search</i>	<i>Inactive</i>
<i>Employed</i>	94.63	21.02	4.71
<i>In Search</i>	1.45	26.08	3.83
<i>Inactive</i>	3.92	52.90	91.46
<i>Total</i>	100.00	100.00	100.00

**Table 11**

Employment status of married women in 2009 conditional to their employment status 12 months before while the employment status of their husbands is “in search” one year before

<i>2009</i>	<i>Employed</i>	<i>In Search</i>	<i>Inactive</i>
<i>Employed</i>	91.15	22.03	3.75
<i>In Search</i>	3.67	22.03	4.02
<i>Inactive</i>	5.18	55.93	92.24
<i>Total</i>	100.00	100.00	100.00

Table 12

Employment status of married women in 2009 conditional to their employment status 12 months before while the employment status of their husbands is “inactive” one year before

<i>2009</i>	<i>Employed</i>	<i>In Search</i>	<i>Inactive</i>
<i>Employed</i>	93.83	19.70	2.45
<i>In Search</i>	1.27	27.27	1.87
<i>Inactive</i>	4.90	53.03	95.68
<i>Total</i>	100.00	100.00	100.00

Next, we compare the transitions from employment conditions of the women between  $t-1$  and  $t$ , conditional to the employment status of the husband 12 month before. For this purpose, we observe the 3-dimensional tables 10, 11 and 12 above. For husbands "employed" 12 months before the percentage of women that enter the labour market in 2009 (from “inactive” to “employed” or “in search”) is about 8.54%, not much different from the percentage of women with husbands "in search" (7.77%). The percentage of women with husbands “inactive” instead is 4.32%. Married women with a spouse being “inactive” stay inactive as well. As in the case of 2018, in 2009 there is no response of the women to the unemployment of the husband one year after, i.e. no added work effect. These results should be confirmed by the logistic regression model.

## 4 Results

- Sample of 2018

Table 13 - The Logistic Regression results and the Odds Ratios for the restricted sample of 2018

<i>Variables</i>	<i>Coefficient</i>	<i>Odds Ratio</i>
<i>Intercept</i>	-2.88011***	0.05613
<i>Geographical area (Reference North)</i>		
<i>Geographical area (Center)</i>	0.11649	1.12354
<i>Geographical area (South)</i>	0.71534***	2.04488
<i>Citizenship (Reference Italian)</i>		
<i>Citizenship (EU)</i>	0.60115***	1.82422
<i>Citizenship (Non-EU)</i>	0.60173***	1.82528
<i>Education (Reference Primary)</i>		
<i>Education (High School)</i>	-0.35096***	0.70401
<i>Education (Higher Education)</i>	-1.03154***	0.35646
<i>Husbands' emply. cond. 12 m.b. (Reference Employed)</i>		
<i>Husbands' emply. cond. 12 m.b. (In Search)</i>	-0.20913	0.81129
<i>Husbands' emply. cond. 12 m.b. (Inactive)</i>	-0.84214***	0.43079
<i>Husbands' emply. cond. (Reference Employed)</i>		
<i>Husbands' emply. cond. (In Search)</i>	0.54021***	1.71637
<i>Husbands' emply. cond. (Inactive)</i>	0.57514***	1.77737
<i>Wives' emply. cond. 12 m.b. (Reference Employed)</i>		
<i>Wives' emply. cond. 12 m.b. (In Search)</i>	4.04343***	57.02146
<i>Wives' emply. cond. 12 m.b. (Inactive)</i>	5.67061***	290.21066

*P-Values: \*\*\* less than 0.001, \*\* less than 0.01, \* less than 0.05*



After conducting the Logistic Regression the following results were obtained: the variables “age” and “number of children” were not statistically significant, thus a new model excluding these variables has been estimated. The variables: “geographical area” with the modality “South”; “citizenship” with modalities “EU” and “Non-EU” citizens; “education” with modalities “High School”, “Higher education”; “employment condition of the husbands 12 months before” with the modality “inactive”; “employment condition of the husbands in 2018” with modalities “in search” and “inactive”; “employment condition of married women 12 months before” with modalities “in search” and “inactive” were all found to be statistically significant having P-values less than 0.05. The results are shown in Table 13 above.

According to the results obtained from the Odds Ratios, there is a probability of 104.49% increase in the labour force participation of married women if they are in the South of Italy compared to the reference category “the North”. Next, looking at the citizenship, there is a probability of 82.42% increase in the labour force participation of married women if they are EU-citizens and 82.52% increase if they are non-EU citizens both cases compared to the reference category “Italian citizens”. In case of the education, there is a probability of 42.86% (1/0.7) decrease in the labour force participation of married women if they have a High School education and a probability of 177.78% (1/0.36) decrease if they have a Higher level of education both cases compared to the reference category “Primary education”. Looking at the employment condition of the husbands 12 months before, there is a probability of 132.56% (1/0.43) decrease in the labour force participation of married women if their husbands were out of the labour force (“inactive”) 12 months before compared with if their husbands were employed 12 months before. Whereas, there is a probability of 71.64% increase in the labour force participation of married women if their husbands are currently “in search” and a probability of 77.74% increase if their husbands are currently “inactive”. Finally, there is a probability of 57.02 times increase in the labour force participation of married women if they were “in search” 12 months before and a probability of 290.21 times increase if they were “inactive” 12 months before.

The results obtained about the educational level adversely affecting the labour force participation of married women are counterintuitive; one might suppose that the employment of married women should increase together with the educational level obtained as the labour market demands higher education. However, in the Descriptive Statistics shown above, the employment of married women in 2018 was higher if they had High School education compared to Primary and Higher educational levels obtained. Moreover, if we look at the type of employment of

married women in 2018 (See Figure 16 above), then those working as Blue-collar employees (28.1%) had higher employment than married women working as managers (7.2%). Thus, the counterintuitive result mentioned above can be explained by the following assumptions: 1) the level of competition in 2018 was high, consequently, there was a shortage of workplaces for married women having a Higher educational level to find a job; 2) those women with Higher educational level were overqualified for the market demands at the time, as Blue-collar workers were prevailing and managers were constituting only 7.2%.

Next, if the employment condition of the husbands 12 months before is adversely affecting the labour force participation of married women, then according to the analysis no added worker effect is found for 2018. Moreover, the labour force participation of married women is positively affected not by the previous but by the current labour force condition of their husbands; when the husbands are “in search” or “inactive” at time  $t$ , the chance of married women being employed increases.

- Sample of 2009

Table 14 - The Logistic Regression results and the Odds Ratios for the restricted sample of 2009

<i>Variables</i>	<i>Coefficient</i>	<i>Odds Ratio</i>
<i>Intercept</i>	-2.81876***	0.05968
<i>Geographical area (Reference North)</i>		
<i>Geographical area (Center)</i>	0.26509***	1.30354
<i>Geographical area (South)</i>	0.70282***	2.01945
<i>Citizenship (Reference Italian)</i>		
<i>Citizenship (EU)</i>	0.16501	1.17941
<i>Citizenship (Non-EU)</i>	0.57454***	1.77631
<i>Education (Reference Primary)</i>		
<i>Education (High School)</i>	-0.37968***	0.68408

<i>Education (Higher Education)</i>	-0.81453***	0.44285
<i>Husbands' emply. cond. 12 m.b. (Reference Employed)</i>		
<i>Husbands' emply. cond. 12 m.b. (In Search)</i>	-0.17354	0.84068
<i>Husbands' emply. cond. 12 m.b. (Inactive)</i>	-0.08568	0.91789
<i>Husbands' emply. cond. (Reference Employed)</i>		
<i>Husbands' emply. cond. (In Search)</i>	-0.16064	0.85160
<i>Husbands' emply. cond. (Inactive)</i>	0.34016*	1.40517
<i>Wives' emply. cond. 12 m.b. (Reference Employed)</i>		
<i>Wives' emply. cond. 12 m.b. (In Search)</i>	3.91539***	50.16840
<i>Wives' emply. cond. 12 m.b. (Inactive)</i>	5.65712***	286.32413

***P-Values: \*\*\* less than 0.001, \*\* less than 0.01, \* less than 0.05***

After conducting the Logistic Regression for the restricted sample of 2009, the following results were obtained: the variables “age” and “number of children” were not statistically significant, thus a new model excluding these variables has been estimated. The variables: “geographical area” with the modalities “Center” and “South”; “citizenship” with modality “Non-EU” citizens; “education” with modalities “High School”, “Higher education”; “employment condition of the husbands in 2009” with the modality “inactive”; “employment condition of married women 12 months before” with modalities “in search” and “inactive” were all found to be statistically significant having P-values less than 0.05. The variable “employment condition of the husbands 12 months before” was not statistically significant.

According to the results obtained from the Odds Ratios, there is a probability of 30.35% increase in the labour force participation of married women if they are in the Center of Italy and a probability of 101.94% increase if they are in the South, in both cases compared to the reference category the “North”. Next, looking at the citizenship, there is a probability of 77.63% increase in the labour force participation of married women if they are non-EU citizens. In case of education, there is a probability of 47.06% (1/0.68) decrease in the labour force participation of married

women if they have a High School education and a probability of 127.27% (1/0.44) decrease if they have a Higher level of education both compared to the reference category “Primary education”. Looking at the current employment condition of the husbands, there is a probability of 40.52% increase in the labour force participation of married women if their husbands are currently “inactive”. Finally, there is a probability of 50.16 times increase in the labour force participation of married women if they were “in search” 12 months before and a probability of 286.32 times increase if they were “inactive” 12 months before.

As in the case of 2018, no added worker effect was found in 2009 according to the analysis. Only the current working condition of the husbands affects the labour force participation of married women in 2009. The same counterintuitive results about the level of education adversely affecting the labour force participation of married women are also present in 2009.

## 5 Conclusion

In this paper the response of married women's labour supply conditional on some individual characteristics such as age, citizenship, number of children and their husbands' employment condition are studied. Thus, this study also examines the added worker effect in Italy. Analysing the data taken from the Italian Labour force Survey we identify the employment condition of both husbands and wives in time  $t$  and time  $t-1$ . The time  $t-1$  represents 12 months before. The analysis covers the years 2009 and 2018.

According to the analysis conducted for this paper, no added worker effect was found neither for 2009 nor for 2018 in Italy. A correlation was found between some other variables examined in the study such as geographical area, citizenship, education, the current employment condition of the husbands, the previous working condition of the wives and the labour force participation of married women.

Although no added worker effect was found in this paper for Italy in 2009 and 2018, the results found should be confirmed with further analysis as the model used in this paper is a static one. The model does not take into account the response of married women to transition of husbands from employment to unemployment from time  $t-1$  to time  $t$ ; instead it only considers the employment status of married women conditional to the employment status of their husbands at  $t-1$  and at  $t$ . For the later analysis it could be interesting to examine also the "discouraged worker" effect as well as longer-term effects on the labour force participation of married women.

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