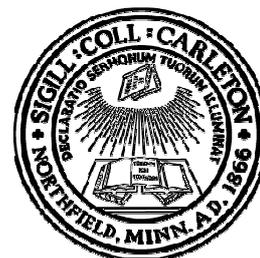


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*Added Worker Effect Revisited: The “Aubry’s  
Law” in France as a Natural Experiment*

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## **I. Introduction**

There is a popular belief among policy makers that the reduction in standard working hours would lead to increased employment. The underlying idea is that since the demand for labor is fixed, if each worker works fewer hours, available work may be distributed among more people. Recently, in many European countries, notably France, Belgium, Italy and Germany, standard working hours have been reduced. In evaluating the effectiveness of such policy, empirical research based on micro-data concentrated on the impact on people directly affected by the policy, ignoring possible spillover effects. In a household decision setting, although it is the husband who is directly affected, the spouse's work behavior may change in response to the policy. Not much is known about this potential spillover effect. The main purpose of this paper is to investigate the married women's labor force participation in response to exogenous restriction on the hours worked by husbands.

With an exogenous decrease in the standard hours worked in a week, there is a possibility that employment will decrease owing to both scale effect and substitution of workers with hours and capital (Hunt, 1996, Crepon and Kramarz, 2002). An increase in the risk of unemployment of the primary breadwinner, or the possibility of a decrease in income from exogenous working hour restrictions may induce households to send more of its family members to search for paid work, as an insurance against such risk. This is known as "The Added Worker Effect (AWE)". The literature investigating AWE asserts that when the husband loses his job, there is a decline in the family income which induces the wife to actively participate in the labor market (if her leisure is a normal good). Again, the unemployed husband can spend more time in home production, and this substitution effect again reduces the relative value of the wife's non-market time and induces her to work for wage<sup>1</sup>. But the extent to which husband and wife's non-market time are substitutes or complements is an empirical question. The AWE became a topic of considerable empirical research and debate. The empirical results are mixed. Heckman and MaCurdy (1980) showed that in a life cycle context, inter-temporal allocation of wife's labor is not affected by her spouse's transitory unemployment shock. This is because wives of husbands facing greater risk of unemployment will usually work more hours, not necessarily at the point when husbands are unemployed. As long as the income loss from a short spell of unemployment

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<sup>1</sup> See Ashenfelter (1980) for a detailed theoretical analysis.

is small relative to husband's lifetime earnings, the studies that look at the long-run relationship between husband's annual hours of unemployment and wife's labor supply will not observe any Added Worker Effect. But these long-run measures fail to capture how households respond in the short run to smooth out fluctuations in income and consumption due to the husband's transitory unemployment.

There are some studies which uncover some significant but small magnitude of AWE (Mincer 1962; Lundberg, 1985; Gruber and Cullen, 1996). Mincer (1962) in his classic paper noted that a transitory reduction in income due to the husband's brief spell of unemployment has a stronger effect on his wife's labor supply than a permanent one. Lundberg (1985) in her seminal paper, studies the AWE in terms of employment transition probabilities of wives rather than static measure of labor supply. She looks at the unemployment uncertainty of husbands and credit constraints in generating short-term participation of wives and finds a small but significant AWE for white couples. Gruber and Cullen (2000) discussed the importance of the unemployment insurance (UI) program, while investigating the AWE in households. Their results indicate that in the absence of unemployment insurance, wives' total hours of work would increase by 30% during the unemployment spells of their husbands. These papers investigate AWE when the husband becomes unemployed.

There is only one paper (Hunt, 1998) which addresses AWE when the spouse is affected by reduction in standard working hours. Hunt, using a German panel of 1984-1994 found that reductions in standard hours of full-time male manufacturing workers seem to have no effect on the employment rate of women, but have caused a small reduction in the hours of their female partners who were in the labor force, possibly due to complementarity of leisure between the couples<sup>2</sup>. The German standard work hour reduction was mostly initiated by labor unions in particular industries, was a gradual process and was always accompanied by full wage

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<sup>2</sup> Hunt (1998) in her fixed effect estimates of partner's hours on wife/partner's hours uses the male partner's standard hours as an instrument for his actual hours. The reduction in hours in Germany in a particular industry is agreed on in advance and could not be renegotiated. Her decision to participate is dependent on her expectation about her husband/partner's standard hours. This expectation, a part of the error term, can possibly be correlated with the instrument and the author didn't provide any evidence of the instruments passing the validity and non-exclusion restrictions. Moreover, the individual fixed effect estimates may be biased if there are individual specific components that vary over time and affect both the wife and husband's hour choice decision.

compensation<sup>3</sup>. Thus it is unlikely to find any income effect for women whose spouses' hours were reduced.

The mandatory reduction in weekly working hours in France known as “Aubry’s Law I” provide an excellent platform for empirical investigation of AWE due to reduction in standard hours worked by husbands. This paper contributes to the literature by using the “Aubry’s Law I” as a natural experiment to identify the two dimensions of labor supply response of women when their husbands are subject to work hours restrictions: (1) probability of participation in the labor market by unemployed or inactive wives, and (2) changes in the hours worked by the wives who are already in the labor market. The exogenous assignment of treatment, which in other situations may be endogenously related to the outcome of interest, allows better estimates of AWE. Since this law is implemented across the whole economy, there is no scope of endogenous placement. As far as I know, this is the first attempt that uses natural experiment to estimate the possible AWE attributed to the work week reduction. Most of the previous studies in their empirical estimation of AWE used micro level data sets from as early as 1950 to 1994 at the latest. This paper uses more recent data.

## **II. The Reduction of the Workweek (Aubry’s Law): A Natural Experiment**

The Law Aubry I ( June 13, 1998) stipulated that the standard work week of enterprises with more than 20 employees had to be reduced to 35 from 39 hours by February 2000 (not including civil servants: state personnel, hospital staff and local authorities), while the deadline for firms with less than 20 employees was set to January 1, 2002. The firms were provided subsidies (reductions in social security contribution) for reducing the standard working time by at least 10% of its original length. According to government sources, this would increase employment by at least 6%. Overtime would be paid to workers after the threshold of 35 hours per week. In January 19, 2000, Law Aubry II confirmed the deadlines for the legal working week under Aubry I. It introduced new methods of work organization, calculation of an effective work week, and limits and rules governing overtime hours. Maximum weekly hours limit was set at 48 hours. Hourly overtime premium pay between June 1998 and January 1, 2000 period would be 10% for

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<sup>3</sup> The initiative to reduce hours from 40 by labor unions in metal and related industries, started in 1978, gained momentum in 1982-83 and were successful in 1985 (38.5 hour week). They kept on negotiating and in 1995 they successfully reduced the work hours to 35.

the 36 to the 39 hours, 25% for the 40 to 43 hours and 44 hours onwards would receive 50% premium. It also guaranteed a minimum monthly income for employees receiving the minimum monthly wage (SMIC). In order to prevent employees on the minimum wage from being penalized by working 35 hours, the government introduced a transitional guaranteed wage provision.

This monthly minimum wage, calculated on an hourly basis and set by the government, is adjusted for inflation rate and economic growth of the country. The law of the 35 hour week asserted that reduction in working time would not lower the real income of the minimum wage earners on a 35 hour week, requiring a rise of 11.4% in the wage rate. By July 2000, even with a rise of 3.2% in the SMIC, those working a 35 hour week received FRF 119.92 less than people working a 39 hour week<sup>4</sup>. The government's objective was to make a series of readjustments to these minimum wage rates in order to achieve a single minimum wage rate on July 1<sup>st</sup>, 2005. The law would have the effect of increasing the minimum hourly rate by 11.4% at the end of the period of minimum wage harmonization. By 2000, according to government sources, 40,293 enterprise agreements had registered allowing more than 4.1 million employees to switch over to a 35 hour week<sup>5</sup>. I am interested in the first part of the legislation, i.e., where the large firms with more than 20 employees need to reduce their hours by January 2000. This is mostly due to data availability and also because the government was more flexible in case of smaller firms adopting the law and reducing hours by the deadline of 2002.

### **III. Estimation of the AWE in France**

#### *Data*

The data from the annual French Labor Force Survey, *Enquete Emploi* (EE) for the years 1993-2000 is used in this paper. Approximately, 65,000 households are surveyed each year in March with one third of the sample being replaced each year. Hence all of the members in nearly 22,000 households are followed at most three times provided they do not move during this three year period. The data set includes individual specific information on demographic characteristics (e.g.

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<sup>4</sup> European Industrial relations observatory online (<http://www.eiro.eurofound.ie/2000/01/feature/fr0001137f.html>)

<sup>5</sup> Official Website of French Ministry of Labor and employment

age, sex, marital status, number of children present at home, level of education etc.) and labor market characteristics (e.g. labor force participation status, net monthly salary, usual hours worked in a week, region of residence etc.).

Only married couples are selected for the regression analysis. I also exclude workers employed as civil servants or in the public sector since they are not affected by the law in 2000. All young workers employed in publicly funded programs that support subsidized low wage employment or combine education with training are also excluded. The age limit for participation in these programs is 25 or less. I only kept individuals who are in the 26 to 65 age range. This sample also avoids school to work transitions of wives. All the self-employed and unemployed husbands are also excluded.

The control variables include education, age, age squared, regional dummies and regional unemployment rate. There are six education categories: Junior High School (6-16 years), basic vocational/technical school (18 years), Baccalaureate, Baccalaureate plus two years, graduate level (Baccalaureate plus 4 years), leaving no education as the reference category. The French Labor Force Survey definition of employment is the same as the International Labor Office (same as the US BLS definition). The data on minimum wages and price indices for different years are taken from the INSEE monthly bulletin<sup>6</sup>.

### *Identification Strategy*<sup>7</sup>

A transparent exogenous source of variation in the explanatory variable that determines the assignment of treatment is essential for a natural experiment study. It is clear from the discussion on Aubry's law that people who were working more than 35 hours in large firms (with more than 20 employees) are affected by this law in 2000. Thus our potential treatment group consists of people who used to work more than 35 hours in the large firms in June 1998. Our control group consists of households where the household head works 35 or fewer hours in a small firm<sup>8</sup>. Thus the identification conditions are: (1) people working 35 hours or less in a small firm are not affected by the law (control group); (2) the transition from unemployment to employment (or

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<sup>6</sup> National Institute of Statistics and Economic Studies ([http://www.insee.fr/en/home/home\\_page.asp](http://www.insee.fr/en/home/home_page.asp))

<sup>7</sup> Identification strategy adopted here is motivated by Crepon and Kramarz (2002).

<sup>8</sup> There are other potential control groups. The difficulty and drawbacks of different and alternative control groups are discussed in section V.

vice versa) or increase or decrease in working hours of the wives of the control group identify what the transition of wives of workers working more than 35 hours would have been in the absence of reduction in work week. This implies that only the policy change affects the treatment and control differently but everything else is same for both groups. It is important that the share of the treatment and control group in the labor force does not fluctuate radically over time.

Table 1 shows the composition of private sector workers working different hours in small or large firms over our sample periods. It is seen that size of the treatment and control group over time does not vary much. The efficiency of the Difference-in-Difference estimates rely on the fact that labor supply of the husbands and wives are stable over time and there were no contemporaneous shocks to the labor market over the study period<sup>9</sup>. Figure 1 shows the average weekly working hours by husbands and wives over the range of the study period. Husbands and wives worked approximately 42 hours and 34 hours per week respectively until 1998. In 2000 the average weekly hours respectively are 40.91 and 33.09. There is no fluctuation in the observed averages, except for the small but expected decline in the average working hours in 2000.

Table 2 depicts average hours worked by wives conditional on belonging to the treatment or control group. It is observed that average hours worked by wives from treatment and control households are also more or less stable over time. We thus observe no differential trend in the treatment and control groups. It is hypothesized that between 1998 and 2000 Aubry's law changed the labor supply behavior of wives whose husbands had worked more than 35 hours in large firms in 1998. Figure 2 reveals the frequency distribution of hours worked by wives in 2000 conditioned on their hours in 1998 and also belonging to either treatment or control households.

Figure 2 indicates that some of the wives who were working 35 hours or less in 1998 (W35) and from the treatment households worked more than 35 hours in 2000. Almost all wives from treatment households who worked more than 35 hours in 1998 (W>35), are also affected by the law themselves but had not reduced their hours below 35 in 2000. Almost all wives from the control households do not change their labor supply in terms of hours in 2000.

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<sup>9</sup> It is observed from the Table 30 and Figure 4 that the average usual hours worked, total employment and composition of employment in different industries for all males and females in the economy were more or less stable over the study period.

Figure 3 shows frequency distribution of different numbers of hours worked by husbands in 2000, given they worked specific ranges of hours in 1998. It is seen that almost all husbands reduced their hours of work in 2000 from their usual hours in 1998, except for husbands working exactly 35 hours. Thus a reduction in standard working hours has affected treatment households and labor supply behavior of wives, whereas there was not much effect in the control households.

Table 3 shows the summary statistics of the treatment and the control group. The mean hours worked by wives in two groups are not very different from each other. The average family size is about the same and 50% of both groups earn low income<sup>10</sup> (less than 1.3\*SMIC). The husbands and wives in the control group are on an average 4 years older than the couples in the treatment group but the age gap between the couples in both groups are same at about 2 years. There is a small difference in monthly salary earned by wives in the two groups. In terms of educational qualifications both groups are more or less similar: 39% of wives from the treatment households and 37% of wives from the control group have a post baccalaureate or technical degree respectively<sup>11</sup>. About 22% wives in each group do not have any formal diploma. About 20% of husbands in the sample from both groups do not have a diploma. The majority of the husbands have post baccalaureate or technical education, about 42% in the treatment group and 45% in the control group. Overall, the treatment and control group have similar educational background, income status and family size.

The size of the control group, like Crepon and Kramarz (2002) is very small, only 2.5% of the population. This might be a problem in terms of the precision of the estimates. To test the robustness of the results, I used different control groups and a different dependent variable which is discussed later.

For estimation, data on individual married women in a specific year is matched with their employment status two years later. For example, using the individual and household ID we match married females in the 1998 survey with their employment status in 2000. Only the usual weekly hours worked and the employment status variables are collected from the year  $t+2$  while all the other control variables come from period  $t$ . The dependent variable “change in wife’s hours from  $t$  to  $(t+2)$ ” was created as a difference between reported usual hours worked in the

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<sup>10</sup> This definition is chosen following Coninck and Esteveao (2003), Crepon Kramarz (2002) and Kramarz and Philippon (2001).

<sup>11</sup> For a detailed analysis of determinants and patterns of labor force supply of women in France, see Riboud (1985).

two periods. The ‘Aubry’s Law I’ came into being in June 1998 and the deadline for reducing hours by large firms was February 2000. I omitted the year 1999 as the adjustment period. In the same manner all the other panels (93-95, 94-96, 95-97, 96-98) were created, linking period  $t$  and  $(t+2)$ , ignoring the middle year  $(t+1)$  for each panel. Finally I appended these data sets to create a pooled data set which allows me to investigate the changes in the wife’s response before and after the implementation of the new standard work week. I expect a different pattern in the wife’s behavior in the 1998 panel (98-2000) compared to other panels. I am interested in how the wife’s hours change between 1998 and 2000 if the husband is working 36 or more hours in a large firm in 1998. It is hypothesized that wives from treatment households would increase their hours of work, or at least they would not lower their working hours. There is no obvious reason to believe that wives would significantly alter their hours of work prior to 1998 between  $t$  and  $t+2$  if their husbands work 36 or more hours in large firms in period  $t$ . The same argument holds for participation of unemployed and inactive wives when husbands are affected by the hour reduction policy.

*Regression Framework: “Difference-in-Difference” Estimates of the Added Worker Effect*

The reduced form participation equation:

$$(1) \quad \text{prob}(\text{employment}_{-} \text{wife}_{t+2} | X_t, H_t, t) = \alpha + \beta_1 X_t + \beta_2 H_t + \beta_3 Yr98 + \beta_4 \text{Treatment}_t + \beta_5 \text{Treatment}_t * Yr98$$

The reduced form changes in hours equation is:

$$(2) \quad E(\Delta \text{hours}_{-} \text{wife}_{t+2} | X_t, H_t, t) = \alpha + \beta_1 X_t + \beta_2 H_t + \beta_3 Yr98 + \beta_4 \text{Treatment}_t + \beta_5 \text{Treatment}_t * Yr98$$

Where,

*Treatment* is set equal to one if the husband works 36 or more hours in a large firm and zero otherwise. *Yr98* is set to one if the year is 1998 and zero otherwise. In this framework the *Treatment* control for the general time series trend of hour changes of wives when their husbands work more than 36 hours in large firms compared to the control group. *Yr98* captures how the overall economic situation affects wives of the treatment and control group in the particular year. The interaction *Treatment\*Yr98*, the Difference-in-Difference (DID) estimator captures the

responses of wives whose husbands were affected by Aubry I compared to the wives whose husbands worked 35 or less in smaller firms and were not affected the hours restriction<sup>12</sup>. The dependent variable in equation (1) is the employment dummy in period t+2 for a woman who is unemployed or inactive in period t. So this equation in effect is looking at an employment status change.

In equation (2), the dependent variable is the difference in hours worked by wives from period t+2 and t. The estimate indicates the AWE estimate, i.e. how wives respond in terms of hours worked when husbands are affected by the policy compared to the control group and other years. Even if there were no relative changes in group characteristics, controlling for wife's and husband's characteristics (H) and other variables capturing surrounding labor market and household conditions (X) might increase the precision of the coefficient of interest. I included year effects to capture any national trends in changes in hours worked by wives of the treatment group.

#### **IV. AWE Results**

##### *AWE in Terms of Hours Worked By Wives:*

Table 4 shows, how wives' hours of work change if husbands are affected by Aubry's Law. It is hypothesized that a wife from the treatment household, if she is not herself subject to the law, would increase her hours. At least she would not reduce them. The first column reports estimates for the whole sample of wives who are already in the labor force. Then the sample is split according to their status. They themselves may be subject to this work week restriction. The second column reports estimates for wives who work more than 36 hours in large firms. The third column shows estimates for wives who work 35 or fewer hours or in small or large firms in period t. The estimates indicate that if the husband is subject to the hours restriction, women significantly increase their weekly hours of work by more than 3 hours compared to the control group. In column 2, women who are directly affected by the Aubry's Law themselves do not respond to husband's hours restriction, as the coefficient of *Treatment\*Yr98* is not significant.

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<sup>12</sup> For a detailed definition of DID, see Wooldridge (2002).

This is probably due to the fact that most women in France work in the service sector and there is not much possibility of overtime for full time workers.

For the sample of women who work 35 hours or less or in a small firm, therefore not subject to hours restriction, increase their weekly hours of work by 5 ½ hours as a response to reduction in husband's standard hours<sup>13</sup>. The estimate is significant at the 5% level. This finding is partly similar to Hunt's (1998) finding. She also found that reduction in standard hours of full-time male workers had no effect on the employment rate of women but lowered the hours of working women. This is possibly because in Germany, the reduction in standard hours was accompanied by full wage compensation and thus any income-induced AWE is unlikely. But in France, the affected workers would receive full wage compensation by the end of 2005 and it is likely that they suffered some income loss during the study period due to this restriction. Moreover, Coninck and Estevao (2003) found that in 1998 Aubry's law increased the transition probability from employment to unemployment by 1.5 percent for those who worked 36 hours or more in large firms. Crepon and Kramarz (2002) found similar results when investigating the 1982 reduction in standard working hours in France. The AWE in France in terms of increase in weekly working hours by wives may also stem from the potential risk of unemployment of the husbands affected by the new standard. The Yr98 dummy is significant in both columns one and three, indicating how hours of work fell in 1998 compared to previous years. Overall, addition of the coefficients year98 and Treatment\*Yr98 indicate that hours of work for the wives from the treatment households didn't fall as fast as the hours of the wives of the control groups, providing evidence of AWE.

#### *AWE in Hours Worked and Family Income*

Again, the AWE estimate may vary by the income status of the family. We again split the sample of women who themselves were not directly affected by the reduction in standard hours according to husband's salary. It is hypothesized that AWE is more prominent in families with a credit constraint. In Column one in table 5, AWE estimate for low income workers is presented. Column 2 shows parameter estimates for the high income group. While married women in low

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<sup>13</sup> The Socialist Government in their election campaign in April 1997, committed a mandatory 35 hour work week. Separate specifications (with interaction term Treatment\*Year96) were run to investigate the possibility of any anticipatory effect. The coefficient was not significant.

income families increase their work by 7 hours a week in response to their husband's reduction in standard working hours, no significant response is seen from wives in high income households. The coefficient Yr98 is negative and significant. Adding Yr98 and Treatment\*Yr98 indicate that the overall impact of the policy is that treatment wives from the poorer households actually increased their hours of work in 2000 compared to the control group. Crepon and Kramarz (2002) found that due to the 1982 hours reduction in France, a greater number of low wage workers lost their jobs compared to the high wage group. Even though the government discouraged laying off workers and promised to increase the monthly wage to compensate for the reduction in hours, it is possible that the income loss in low income families induced increased hours of work by wives who were not directly affected by the law.

#### *AWE in Hours Worked and Family Size*

AWE may vary by family size. Wives may be more responsive as the credit constraint rises with family size. This is because family consumption may be less flexible in larger families (fixed consumption needs that are tied to children and the dependent senior member). We split the sample of "wives not directly affected" according to family size. The first column of table 6 shows estimates for couples without children or any other dependent family member. We observe no significant response from wives when their husbands work 36 or more hours in large firm. The second and third columns show the estimates for a sub-sample of families with exactly 3 members and 4 or more members respectively. The Difference-in-Difference (DID) estimate reveals that women increase their hours of work by 8 hours and 9 hours respectively in a week for families with 3 members and 4 or more members. AWE is stronger for families with more dependent members as family size is positively correlated with the degree of credit constraint. Gruber and Cullen (2000) also found large UI effect in the presence of younger children. Same calculations were carried out for women who were directly affected by the reduction in hours as shown in table 7 and 8. The coefficient of interest is not significant in any of one of the specifications.

#### *AWE in Terms Participation in the Labor Force:*

Table 9 presents the probit estimates of participation in the labor market in period  $t+2$ , of an unemployed or inactive wife whose husband is subject to the hours restriction compared to a wife of an employee who is not affected. The first column reports the likelihood of participation in  $(t+2)$  of all non-participant (unemployed + inactive) wives from period  $t$ . The coefficient of the *Treatment\*Yr98* is negative and significant for the full sample of non-participants. These non-participant wives may have a preference for not working. Also, they may find it difficult to find employment in the presence of high unemployment in the economy. The second and third columns separately report estimates for the samples of unemployed and inactive wives in period  $t$  respectively. It is seen that the unemployed or inactive wives are unlikely to participate in the labor market if the husband is subject to the hours restriction compared to wives of employees who are not affected by the policy. The estimates are not significant. Since wives have the information that the husbands' reduced hours will be fully compensated in 2005, they probably adjust consumption instead of seeking employment. Hunt's research (1998) in Germany also found that the reduction in hours had no impact on labor force participation when the reduced hours were accompanied by full wage compensation. Gruber and Cullen (2000) found the likelihood of participation to increase by 12.7% when a woman's husband faced unemployment. But for France, the reduction of the husband's standard hours did not induce the wife's unemployment to employment transition, but did increase the number of hours by a wife already working.

Tables 10 and 11 present probit estimates of participation in  $t+2$  for all non-participants in period  $t$ , for different income categories and family sizes respectively. One important result is that non-participant wives from low income households are unlikely to participate in the market when their husband's hours are subject to restriction, as the coefficient *Treatment\*Yr98* is negative and significant at 5%. This result is unexpected. One possible explanation is that, these wives with husbands who are low wage workers, have fewer labor market skills (due to assortative mating). With a rise in minimum wage, as a part of the law, these wives are less likely to find employment. Lundberg (1985) also found similar results for the black families in the United States. Also, in the presence of a child or dependent members, the non-participant wives are less likely to participate. Larger family size (4 or more members) has no significant impact on the participation decisions of non-participant wives.

The results from French data confirm Mincer (1962) and Lundberg's (1985) central conclusion that AWE is seen in credit-constrained families due to a temporary drop in family income. This significant AWE in terms of increased hours worked by wives who are already in the market and not affected by Aubry's law can be attributed to an income decrease in the treatment households. Compared to non-participant wives, these wives are better equipped to adjust to this income shock, and able to increase working hours, thereby maintaining their optimum level of previous consumption. They find it optimal to increase hours to compensate the household income loss to some extent rather than borrowing or dissaving. But we do not observe positive and significant transitions of unemployed or inactive wives to employment due to this transitory and small income decline. This may be attributed to the forward-looking behavior of the unemployed wives as well as their labor market characteristics.

By 2005, hours reduction would be fully compensated and workers would not suffer any income loss. So probably these families adjusted their consumption expenditure during this short period of income loss and not their labor supply response. Again, it is possible that these unemployed and inactive wives lacked certain labor market skills or have other constraints and were discouraged to look for employment for this short period.

## **V. Robustness Check**

It was mentioned earlier that the size of the control group is quite small compared to the treatment group and this might affect the precision of the estimates. To test the robustness of the results I estimated the same set of equations but used several different and alternative control groups, and a different dependent variable, namely, the following:

1. Husbands working 20-35 hours in a smaller firm
2. Husbands working 35 or less, either in large or smaller firms
3. Hours worked during the week before the survey instead of usual weekly hours

The results are presented in Tables 12-29. It is seen that in case of first control group the results are very similar to the results already discussed. Moreover this control group consists of husbands who are working longer hours; in this respect they are more similar to the treatment group. But because of the smaller size of the control group in the sample and the arbitrariness involved in the choice, the original control group (less than 35 hours in small firm) was used in

the paper. Again in case 3, the reported hours worked in the week preceding the survey for both husband and wife were used to carry out the estimation. The results from all the specifications strengthen the AWE hypothesis, albeit all the coefficients of interest are insignificant. In terms of participation, the results are very similar to the ones discussed. Usually in the literature, it is debated that hours worked a week before the survey may suffer from a measurement problem. Since our assignment of treatment and control groups is crucially dependent on the hours worked variable, the estimates using this variable is not the optimal way to investigate the AWE issue. There are two other potential control groups. Husbands working 35 or less hours in large firms and husbands working 35 or more in small firms (as the deadline for smaller firms were was February 2002). But there might be large -scale effects or redistribution of work in large firms and the people working 35 or less in these firms might be affected. It has been documented that some smaller firms adopted the 35 work week by 2000 even though their deadline was 2002. The estimates would be biased if these two groups are used as control groups. Households where husbands work 35 or more hours in smaller firms would have been a more appropriate control group, with the working pattern exactly matching the treatment group. However, since some of the smaller firms signed the government contract before their stipulated deadline of 2002, using this group as a control would provide problematic results. When households where the husbands work only 35 hours or less were (in either larger or smaller firms) used as control, AWE estimates in all specifications, both in hours worked and participation specification, have the desired signs and most of them are significant. But due to the reasons cited, this is not an ideal control group. Nevertheless, it justifies the presence of AWE in terms of increased hours worked by wives when husband's hours are exogenously reduced and adds to the robustness of the estimates.

## **VI. Conclusion**

This paper adds to the existing literature on added worker effect in several ways. It looks at married women's labor supply decisions when their husband's working hours are exogenously constrained. This empirical study emphasizes the role of credit constraint and family size in the labor force participation decision. It was observed that wives from treatment households

increased their hours of work, or at least had not reduced their hours compared to the control group. There was no significant transition to employment for unemployed or inactive wives. It is possible that even after controlling for all possible observed characteristics, unobserved differences between the treatment and control group exist and hence the estimates suffer from heterogeneity bias. In equation (2) I estimate the impact of reduction of standard hours worked by husbands on changes of hours of work by wives from period  $t$  and  $t+2$ . It is very difficult to think about any individual-specific and family-specific variable that would induce wives of treatment groups to systematically change their working hours in between two periods ( $t$  to  $t+2$ ) compared to the control group. Hence the wife's hours change equation is less likely to suffer from such bias. The same argument holds for employment transition probabilities. Also the extent of the problem is smaller in each sub-sample of people, as the group heterogeneity is likely to be small. Again, if the distributions of unobserved characteristics of the treatment and control groups are time invariant, the estimated coefficients are not contaminated

I run the same set of regressions for a different sub-set of people based on the employment category and industry of work (not reported here) and no discernible pattern is observed. Finally, as the *Enquete Emploi* survey is carried out every March, the treatment and control status is assigned by the information provided by people in March. The Law Aubry I came into being on June 1998. It is not possible to account for the people who changed their firm size and working hours between March and June 1998. Since in this data set each person can be traced at most three times, it was observed that no one in the treatment or control group reported any change in his firm size between 1998 and 2000.

The results demonstrate that an exogenous reduction in husband's working hours by 4 hours per week (10%) leads to an increase in wife's hours, who were basically part time workers, by 5 hours or more per week. This effect is more prominent in poor and larger families. One important objective of this law was to increase the quality of life. But it seems that the law contributed to some decrease in welfare for the poorer and larger households. This un-intended effect of the law needs more careful discussion and opens an interesting avenue for further study of the impact of Aubry's law.

**References:**

- Ashenfelter, O. Unemployment as Disequilibrium in a Model of Aggregate Labor Supply. *Econometrica* 1980;48; 547-564.
- Coninck, R Estevao M. The 35 Hour Workweek in France: Who Suffered from it. IMF Working Paper, International Monetary Fund, 2003.
- Crepon, B and Kramarz F. Employed 40 Hours or Not Employed 39: Lessons from the 1982 Mandatory Reduction of the Workweek. *Journal of Political Economy* 2002;110;1355-1389.
- Cullen, J B and Gruber J. Does Unemployment Insurance Crowd Out Spousal Labor Supply? *Journal of Labor Economics* 2000; 18; 546-71.
- French National Assembly. The Bill Relating to Pay the Working Week and Job Creation. October 15<sup>th</sup> 2002, [www.35h.travail.gouv.fr](http://www.35h.travail.gouv.fr)
- Heckman, J and MaCurdy T E. A Life Cycle Model of Female Labor Supply. *Review of Economic Studies* 1980; 47; 47-74.
- Hunt, J. The Response of Wages and Actual Hours Worked to the Reductions of Standard Hours NBER Working Paper 1996; 5716.
- Hunt, J. and Lawrence Katz, "Hours Reductions as Work-Sharing", *Brookings Papers on Economic Activity*; 1998; 1; 339-381.
- Kramarz F Philippon T. The Impact of Differential Payroll Tax Subsidies on Minimum Wage Employment. *Journal of Public Economics*; 2001; 82; 115-146.
- IMF Document, France, 2000 Article IV Consultation., IMF, Washington DC.
- Lundberg, S. The Added Worker Effect. *Journal of Labor Economics*; 1985; 3; 11-37.
- Mincer, J. 1962. Labor Force Participation of Married Women. In: Lewis HG (Eds), *Aspects of Labor Economics*, Princeton University Press: Princeton New Jersey; 1962. p 63-97.
- Riboud M. An Analysis of Women's Labor Force Participation in France: Cross-Section Estimates and Time Series Evidence. *Journal of Labor Economics*; 1985; 3; 177-200.
- Wooldridge J M. *Econometric Analysis of Cross Section and Panel Data*. The MIT Press: Cambridge MA; 2002.

**Table 1: Fractions of Husbands Working in Period t.**

Fraction of Husbands Working	1993	1994	1995	1996	1998
35 or less in small firm	0.024	0.025	0.023	0.025	0.024
36 or more in large firm	0.546	0.587	0.563	0.582	0.613
35 or less in large or 36 or more in small firm	0.429	0.387	0.413	0.391	0.362

**Table 2: Average Hours Worked by Wives**

year	Husband work	Husband works
	more than 35 hours	less than 35 hours
1993	35.05	33.53
1994	34.04	33.72
1995	34.44	33.58
1996	33.96	32.96
1997	33.98	33.21
1998	34.33	33.62
1999	33.59	33.42
2000	33.87	33.21

**Table 3: Summary Statistics of Treatment and Control Group**

	Treatment	Control
Average Family Size	3.72	3.46
Wife's Characteristics		
Age of Wife	41.09	45.04
Hours Worked: Wife	33.91	34.45
Monthly Salary: Wife	5649.27	5962.65
W_Post Baccalaureate and Technical Diploma (%)	38.62	36.90
W_Baccalaureate (%)	13.19	12.5
W_18 years (%)	9.08	10.71
W_6-16 years compulsory (%)	17.18	17.56
W_No diploma (%)	21.93	22.32
Husband's Characteristics		
Age of Husband	43.25	47.62
Hours Worked: Husband	41.16	23.33
Monthly Salary: Husband	8673.95	5739.11
H_Post Baccalaureate and Technical Diploma (%)	42.05	44.94
H_Baccalaureate	8.80	9.82
H_18 years	5.07	6.55
H_6-16 years compulsory	18.30	19.05
H_No diploma	20.82	19.64
Husband's Salary < 1.3*SMIC (%)	53.52	50.59
N	7545	336

**Table 4: AWE in Terms of Hours Worked by Wives Who are Already in Labor Force**

	All Women	Directly Affected by Policy	Not Directly Affected by Policy
Year98 (Yr98)	-4.516 (0.005)***	-1.180 (0.479)	-6.090 (0.016)**
Treatment	-1.118 (0.139)	0.612 (0.564)	-1.189 (0.237)
Treatment*Yr98	3.373 (0.037)**	-0.748 (0.654)	5.483 (0.032)**
Observations	4872	2069	2713

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Table 5: AWE in Terms of Hours in Low Income Families for Women Who are not Directly Affected by Policy**

	Low Income	High Income
Year98 (Yr98)	-7.316 (0.027)**	-4.267 (0.291)
Treatment	-0.539 (0.689)	-1.692 (0.290)
Treatment*Yr98	7.352 (0.027)**	2.386 (0.558)
Observations	1536	1177

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Table 6: AWE in Terms of Hours in Different Family Size for Women Who are not Directly Affected by Policy**

	2 Members	3 Members	4 or More Members
Year98 (Yr98)	1.384 (0.800)	-7.319 (0.074)*	-10.847 (0.011)**
Treatment	1.196 (0.639)	-1.800 (0.272)	-3.113 (0.038)**
Treatment*Yr98	-0.305 (0.956)	8.099 (0.049)**	9.337 (0.030)**
Observations	408	698	1607

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Table 7: AWE in Terms of Hours in Low Income Families for Women Who are Affected by Policy**

	Low Income	High Income
Year98 (Yr98)	-3.355 (0.246)	4.699 (0.407)
Treatment	-0.472 (0.549)	5.037 (0.371)
Treatment*Yr98	1.306 (0.652)	-6.635 (0.247)
Observations	1271	798

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Table 8: AWE in Terms of Hours in Different Family Size for Women Who were Affected by Policy**

	2 Members	3 Members	4 or More Members
Year98 (Yr98)	-8.055 (0.217)	-1.213 (0.532)	2.975 (0.346)
Treatment	-1.353 (0.486)	-1.786 (0.003)***	2.837 (0.356)
Treatment*Yr98	6.572 (0.316)	-1.423 (0.468)	-4.605 (0.149)
Observations	411	659	999

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Tab 9: Probit Estimates of Participation in Period t+2, Given Status in t**

	Unemployed_t+Inactive_t	Unemployed_t	Inactive_t
Year98 (Yr98)	0.799 (0.078)*	5.665 (0.000)***	0.790 (0.167)
Treatment	0.109 (0.599)	-0.306 (0.396)	0.306 (0.256)
Treatment*Yr98	-0.799 (0.081)*	-5.685 (0.563)	-0.728 (0.208)
Observations	2734	623	2111

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Tab 10: Probit Estimates of Participation in t+2, for Unemployed and Inactive Women in t, at Different Income Levels**

	Low Income	High Income
Year98 (Yr98)	1.055 (0.039)**	-5.119 (0.000)***
Treatment	0.100 (0.674)	0.226 (0.611)
Treatment*Yr98	-1.053 (0.043)**	5.032 (0.943)
Observations	1709	1025

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Tab 11: Probit Estimates of Participation in t+2, for Unemployed and Inactive Women at t and Different Family Sizes**

	2 Members	3 Members	4 or More Members
Year98 (Yr98)	-4.824 (0.000)***	1.467 (0.103)	0.559 (0.274)
Treatment	-0.525 (0.285)	0.387 (0.394)	-0.032 (0.882)
Treatment*Yr98	4.806 (0.768)	-1.576 (0.085)*	-0.499 (0.335)
Observations	493	603	1963

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Robustness Check in Hours Worked: Husbands Working 20-35 Hours in Small Firm as Control Group**

**Table 12: AWE in Terms of Hours Worked by Wives Who are Already in Labor Force**

	All Women	Directly Affected by Policy	Not Directly Affected by Policy
Year98 (Yr98)	-5.555 (0.025)**	-1.592 (0.577)	-8.128 (0.051)*
Treatment	-0.744 (0.451)	0.901 (0.605)	-0.794 (0.495)
Treatment*Yr98	4.407 (0.077)*	-0.326 (0.910)	7.508 (0.073)*
Observations	4848	2063	2695

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Table 13: AWE in Terms of Hours in Low Income Families for Women Who are not Directly Affected by Policy**

	Low Income	High Income
Year98 (Yr98)	-11.911 (0.027)**	-3.161 (0.211)
Treatment	0.116 (0.938)	-1.752 (0.325)
Treatment*Yr98	11.989 (0.027)**	1.244 (0.625)
Observations	1523	1172

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Table 14: AWE in Terms of Hours in Different Family Size for Women Who are not Directly Affected by Policy**

	2 Members	3 Members	4 or More Members
Year98 (Yr98)	1.478 (0.708)	-8.075 (0.147)	-13.396 (0.007)***
Treatment	2.598 (0.300)	-2.271 (0.067)*	-3.015 (0.093)*
Treatment*Yr98	-0.404 (0.926)	8.869 (0.111)	11.846 (0.017)**
Observations	404	694	1597

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Robustness Check: Husbands Working 35 or Less Hours in Small or Large Firm as Control Group**

**Tab 15: AWE in Terms of Hours Worked by Wives Who are Already in Labor Force**

	All Women	Directly Affected by Policy	Not Directly Affected by Policy
Year98 (Yr98)	-1.784 (0.031)**	-1.566 (0.124)	-2.123 (0.082)*
Treatment	-0.432 (0.333)	-0.316 (0.510)	-0.361 (0.575)
Treatment*Yr98	0.683 (0.417)	-0.393 (0.702)	1.601 (0.202)
Observations	5110	2148	2868

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Tab 16: AWE in Terms of Hours in Low Income Families for Women Who are not Directly Affected by Policy**

	Low Income	High Income
Year98 (Yr98)	-2.842 (0.079)*	-0.280 (0.843)
Treatment	-0.654 (0.489)	0.469 (0.585)
Treatment*Yr98	3.023 (0.066)*	-1.512 (0.304)
Observations	1621	1247

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies.

Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Tab 17: AWE in Terms of Hours in Different Family Size for Women Who are not Directly Affected by Policy**

	2 Members	3 Members	4 or More Members
Year98 (Yr98)	0.611 (0.839)	-3.288 (0.118)	-1.908 (0.285)
Treatment	0.273 (0.870)	0.119 (0.916)	-0.880 (0.328)
Treatment*Yr98	0.375 (0.904)	4.160 (0.057)*	0.461 (0.800)
Observations	440	739	1689

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Robustness check: Using the Hours Worked During the Week Before the Survey for Estimation**

**Tab 18: AWE in Terms of Hours Worked by Wives Who are Already in Labor Force**

	All Women	Directly Affected by Policy	Not Directly Affected by Policy
Year98 (Yr98)	-2.319 (0.025)**	-1.419 (0.200)	-2.859 (0.060)*
Treatment	0.117 (0.770)	0.451 (0.306)	0.174 (0.765)
Treatment*Yr98	1.345 (0.199)	-0.356 (0.750)	2.425 (0.119)
Observations	4496	1887	2528

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Tab 19: AWE in Terms of Hours in Low Income Families for Women Who are not Directly Affected by Policy**

	Low Income	High Income
Year98 (Yr98)	-2.358 (0.211)	-4.898 (0.148)
Treatment	-0.012 (0.989)	0.798 (0.422)
Treatment*Yr98	2.724 (0.154)	2.869 (0.398)
Observations	1434	1094

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Tab 20: AWE in Terms of Hours in Different Family Size for Women Who are not Directly Affected by Policy**

	2 Members	3 Members	4 or More Members
Year98 (Yr98)	-2.522 (0.554)	-3.100 (0.219)	-3.299 (0.135)
Treatment	-0.220 (0.891)	1.000 (0.348)	-0.321 (0.683)
Treatment*Yr98	2.754 (0.527)	4.072 (0.116)	2.107 (0.349)
Observations	401	650	1477

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Robustness Check for Participation of Wives: Husbands Working 20-35 Hours in Small Firm as Control Group**

**Table 21 : Probit Estimates of Participation in Period t+2, Given Status in t**

	Unemployed_t+Inactive_t	Unemployed_t	Inactive_t
Year98 (Yr98)	0.422 (0.431)	5.637 (0.000)***	0.484 (0.495)
Treatment	0.204 (0.396)	-0.265 (0.565)	0.549 (0.123)
Treatment*Yr98	-0.423 (0.434)	-5.658 (0.544)	-0.428 (0.550)
Observations	2717	619	2098

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Table 22: Probit Estimates of Participation in t+2, for Unemployed and Inactive Women in t, at Different Income Levels**

	Low Income	High Income
Year98 (Yr98)	0.602 (0.308)	-5.003 (0.000)***
Treatment	0.123 (0.648)	0.406 (0.482)
Treatment*Yr98	-0.587 (0.326)	4.891 (0.435)
Observations	1702	1020

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Table 23: Probit Estimates of Participation in t+2, for Unemployed and Inactive Women at t and Different Family Sizes**

	2 Members	3 Members	4 or More Members
Year98 (Yr98)	-4.982 (0.000)***	1.829 (0.121)	-0.149 (0.813)
Treatment	-0.686 (0.211)	0.751 (0.369)	0.016 (0.948)
Treatment*Yr98	4.960 (0.549)	-1.934 (0.105)	0.194 (0.761)
Observations	485	598	1952

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust P Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Robustness Check for Participation: Husbands Working 35 or Less Hours in Small or Large Firm as Control Group**

**Table 24: Probit Estimates of Participation in Period t+2, Given Status in t**

	Unemployed_t+Inactive_t	Unemployed_t	Inactive_t
Year98 (Yr98)	0.485 (0.038)**	0.379 (0.403)	0.470 (0.125)
Treatment	0.098 (0.479)	-0.049 (0.851)	0.170 (0.359)
Treatment*Yr98	-0.483 (0.048)**	-0.408 (0.389)	-0.402 (0.210)
Observations	2863	652	2211

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Table 25: Probit Estimates of Participation in t+2, for Unemployed and Inactive Women in t, at Different Income Levels**

	Low income	High income
Year98 (Yr98)	0.494 (0.051)*	0.162 (0.794)
Treatment	0.036 (0.818)	0.290 (0.327)
Treatment*Yr98	-0.466 (0.082)*	-0.271 (0.670)
Observations	1813	1059

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Table 26: Probit Estimates of Participation in t+2, for Unemployed and Inactive Women at t and Different Family Sizes**

	2 Members	3 Members	4 or More Members
Year98 (Yr98)	0.239 (0.668)	1.077 (0.082)*	0.412 (0.115)
Treatment	-0.309 (0.419)	0.506 (0.254)	0.028 (0.855)
Treatment*Yr98	-0.254 (0.677)	-1.196 (0.065)*	-0.365 (0.183)
Observations	521	629	2050

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Robustness Check for Participation: Using the Hours Worked During the Week Before the Survey for Estimation**

**Table 27: Probit Estimates of Participation in Period t+2, Given Status in t**

	Unemployed_t+Inactive_t	Unemployed_t	Inactive_t
Year98 (Yr98)	-0.188 (0.559)	-0.543 (0.395)	-0.121 (0.776)
Treatment	-0.100 (0.377)	-0.290 (0.175)	0.025 (0.869)
Treatment*Yr98	0.166 (0.616)	0.522 (0.424)	0.131 (0.765)
Observations	2539	577	1962

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust P Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Table 28: Probit Estimates of Participation in t+2, for Unemployed and Inactive Women in t, at Different Income Levels**

	Low income	High Income
Year98 (Yr98)	0.065 (0.850)	-5.531 (0.000)***
Treatment	0.027 (0.839)	-0.132 (0.455)
Treatment*Yr98	-0.038 (0.915)	5.339 (0.839)
Observations	1706	1132

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust P Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

**Table 29: Probit Estimates of Participation in t+2, for Unemployed and Inactive Women at t and Different Family Sizes**

	2 Members	3 Members	4 or More Members
Year98 (Yr98)	-6.520 (0.000)***	0.354 (0.595)	-0.329 (0.288)
Treatment	-0.287 (0.270)	0.047 (0.831)	-0.135 (0.219)
Treatment*Yr98	6.315 (0.851)	-0.452 (0.510)	0.357 (0.267)
Observations	509	671	2078

The other controls include age and education of the spouses, regional unemployment rate, year dummies, Paris and Urban dummies. Robust p Values in Parentheses, \* Significant at 10%; \*\* Significant at 5%; \*\*\* Significant at 1%

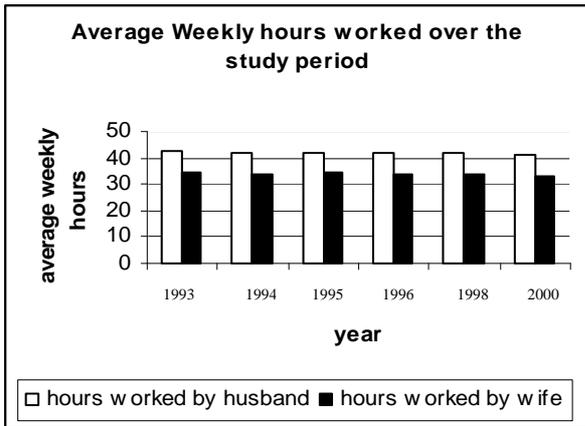


Figure1: Average Hours Worked Over the Study Period

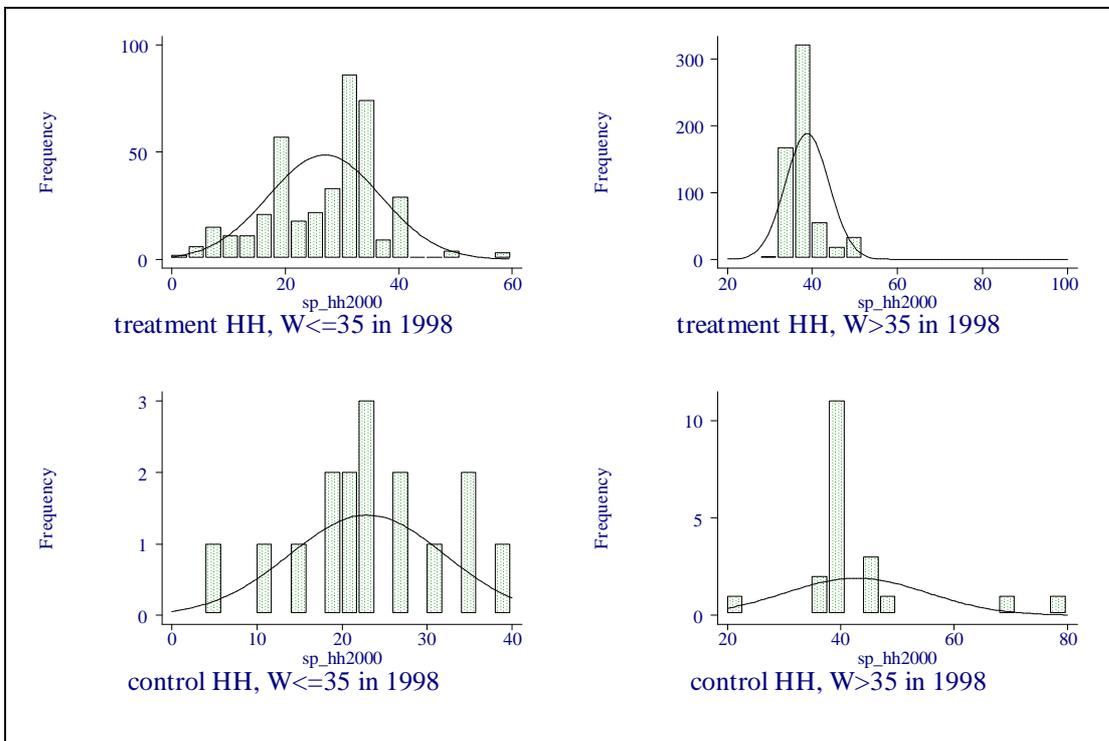


Figure 2: Frequency Distribution of Hours Worked by Wives in 2000 Conditioned on Being from the Treatment and Control Households and Her Hours of Work in 1998

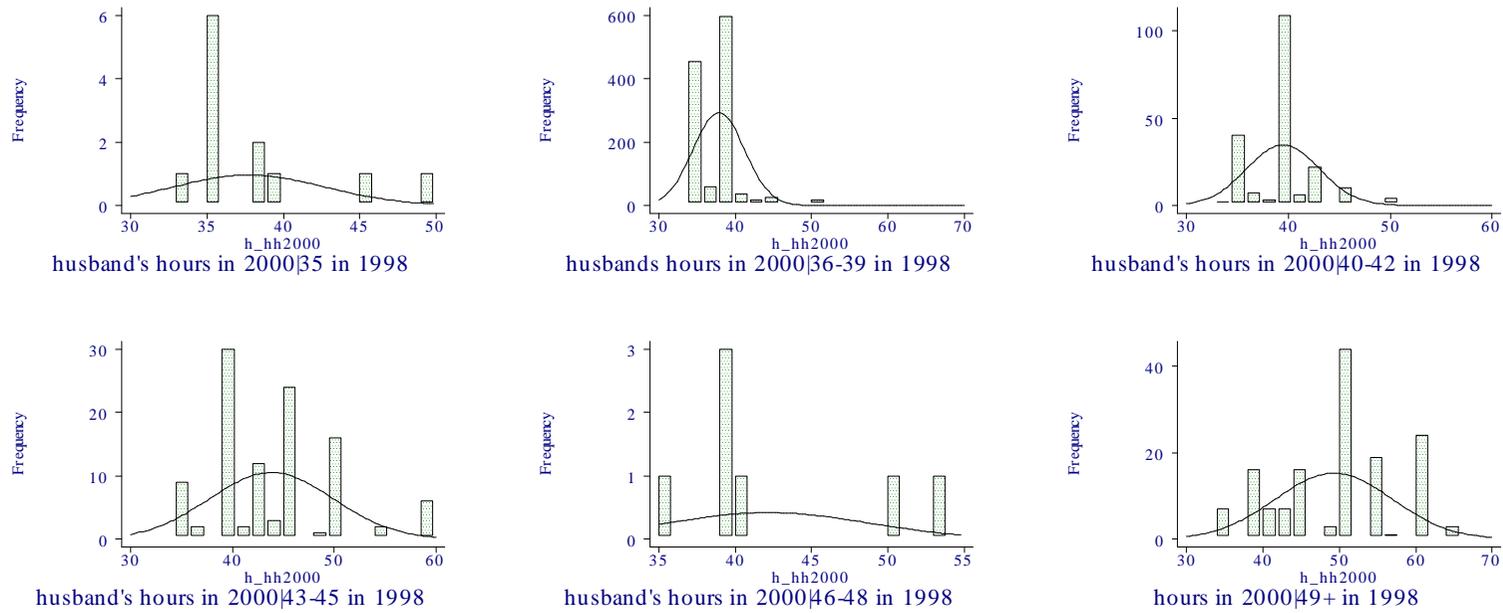


Figure 3: Frequency Distribution of Different Numbers of Hours Worked by Husbands in 2000, Given They Worked Specific Ranges of Hours in 1998

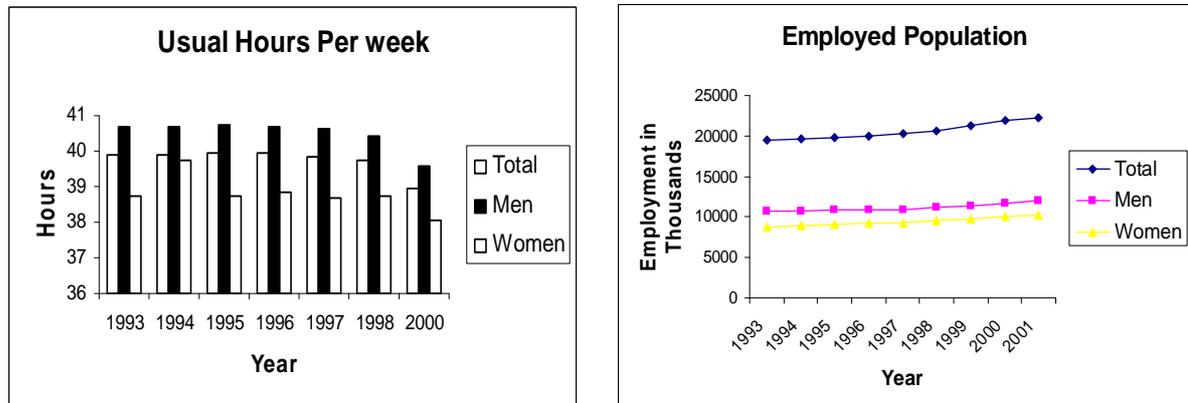


Figure4: Hours and Labor Force Participation of Women in France:  
Source: INSEE and International Labor Organization (ILO)

Tab 30: Wage and Labor Force Participation Statistics:				
<b>Labor Force of France</b>	1980	1990	1995	2000
Total (millions)	24	25	26	27
Female (% of total)	40	43	44	45
<b>Employment: Industry</b>				
Male (% of male labor force)	50	41	38	35
Female (% of female labor force)	25	18	15	13
<b>Employment: Services</b>				
Male (% of male labor force)	48	57	61	63
Female (% of female labor force)	75	82	84	86
<b>Female wages (% of male wages)</b>				
Non-agriculture	87	81	..	81
Manufacturing	77	79	..	79
<b>Unemployment</b>				
Male (% of male labor force)	4.1	7	9.8	8.5
Female (% of female labor force)	9.1	12	13.9	11.9

Source: World Bank Country Report