Worker Displacement and Spouse Labor Supply Adjustments
in Urban China in the Late 1990s

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Abstract

The large amount of displacement due to restructuring of state owned enterprises (SOEs) in the late 1990s provides an opportunity to examine the added worker effect (AWE) in China. Using China Urban Labor Survey (CULS) conducted in five large cities at year-end 2001, this paper finds a significant increase in wives’ labor supply in response to their husbands’ displacement. Husbands’ responses to wives’ displacement are also examined, but the results are not significant. Wives also response to the receipt of public benefits provided to displaced workers, showing a “crowd-out” effects. The displaced individual’s pre-displacement tenure does not provide a significant effect on spouse labor supply.

Keywords: Displacement, Spouse Labor Supply, Added Worker Effect

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1 Introduction

There has been mixed results on wives’ labor supply responses to the unemployment of their spouse. Empirical analysis has found small “added worker effect” (AWE) using U.S. data (e.g., Lundberg, 1985; Spletzer, 1997; Cullen and Gruber, 2000), and sometimes no evidence of such an effect (Maloney, 1987, 1991). Stephens (2002) uses displacement rather than unemployment and finds significant AWE as displaced workers suffer from substantial permanent earnings losses.

As part of the restructuring program of the state-owned enterprises (SOEs), tens of millions of workers lost their jobs during the late 1990s in China. The dislocated workers suffer directly from loss of earnings while unemployed. They also appear to be reemployed for lower wages (Appleton et al., 2002). In addition, reemployment rates are low and imply that unemployment will be long-term (Giles et al., 2006b).

Income of other household members was the most frequently chosen source of private support for individuals experiencing job separations in China (Giles et al., 2006a). This raises the question that what the responses of other household members are given a worker’s displacement. However, previous studies have been on the characteristics of dislocated workers and determinants of their reemployment (Appleton et al., 2002; Giles et al., 2006a, b; etc.). Little is known about the effect of displacement at the household level.

The displacement in urban China in the late 1990s provides an opportunity to examine the AWE in China. Using China Urban Labor Survey (CULS) conducted in five large cities at year-end 2001, this paper analyses spouse labor supply adjustments to worker displacement and focuses in the urban areas. Although female labor force participation rate was high in China in the 1990s, this paper finds increases in wives’ labor supply in response to their husbands’ displacement.
Since labor force participation rate of wives was high in China, there was also a large amount of female workers who lost their jobs. Therefore, husbands’ responses to wives’ displacement are also examined, but the effects are small and insignificant.

Public subsidies were provided to the dislocated workers from SOEs; however, coverage was highly uneven (Giles et al., 2006b). Cullen and Gruber (2000) estimate the effect of Unemployment Insurance (UI) during the spell of unemployment and find a strong “crowd out” effect of UI on family self-insurance. This paper uses a measure of whether the displaced worker received displacement compensation and/or reemployment subsidies, and finds it to have a negative effect on wives’ labor supply.

This paper is set out as follows. Section II provides background information about the displacement in China in late 1990s. Section III reviews the literature related to AWE. Data used in this paper is introduced in Section IV. Section V briefly discusses the regression model and Section VI provides the results. Section VII concludes this paper.

2 Background on Displacement in Late 1990s in China

Prior to the reforms in 1980s, state owned enterprises (SOE) in China employed nearly all urban workers (Chi et al., 2012). Workers were assigned to jobs in work units by state administrative agencies, and were rarely permitted to change jobs on their own. Also, Enterprises could not lay off workers and rarely discharge them for poor performance. Thus, workers expected to have life-time employment, or were expressed to be holding “iron rice bowl” in China (Chi et al., 2012).
Non-state sector grew rapidly in the 1980s and 1990s during the economic reforms, and non-state firms earned considerable profits by undercutting prices for many goods produced in the state sector (Giles, 2006). By the mid-1990s, around 50 percent of SOEs were making losses (Meng, 2004). SOE losses became clearly unsustainable and labor redundancy emerged as a widespread phenomenon in industrial SOEs (Dong and Putterman, 2001).

Restructuring began in 1994 with an emphasis on privatizing small and medium sized SOEs while continuing to support larger enterprises, or “seizing the large and letting go of the small” (Cao, Qian and Weingast, 1999). The Company Law was passed in 1997, with the objective of shifting all enterprises to modern forms of corporate governance that define shareholders and boards of governors, shutting down unprofitable enterprises and diversifying ownership (Giles, 2006). Reform in ownership of larger SOEs followed the law passage. Total employment in the state sector continued to grow through 1996, and then dropped sharply after 1997 (Figure 1). As a result, employment in the state sector fell by 31.1 million between 1994 and 2000 (Knight and Li, 2006).

Certain personal characteristics are associated with greater probability of job losses. Appleton et al. (2002) find that female, less-educated, and middle-aged were at higher risk. However, the result that older workers faced lower risk may be caused by forced early retirement which was not reported as displacement in their survey. Some other factors include poor health conditions and not being a Communist Party member. Effect of belonging to a minority group is insignificant, neither is the dummy for whether the individual had a spouse who had been laid-off from the state sector, even though the government encouraged employers to ensure that married couples were not both laid off.
The dislocated workers suffer directly from loss of earnings while unemployed and also appear to be reemployed for lower wages. Appleton et al. (2002) estimate that the reemployed workers would receive 12% higher wages if they were paid in a like manner to workers who had never been displaced. In a study on income inequality in China, Meng (2004) observes income reductions at the lower end of the income distribution, which is mainly due to the large-scale unemployment during the radical reform period (1995-99). In addition, reemployment rates are low and imply that unemployment will be long-term. Appleton et al. (2002) find that the expected duration of unemployment would be almost 4 years, while Giles et al. (2006b) find that only 38.0 per cent of those losing jobs because of restructuring found new jobs within 12 months. Reemployment earnings are found to decline as unemployment duration becomes longer, an effect that is both statistically significant and quantitatively important given the long unemployment spell (Knight and Li, 2006).

Reemployment service centers were established by enterprises and local governments to administer programs such as providing funds to cover basic living costs and various insurance premiums, retraining for new employment, and assistance in finding jobs (Lee, 2000). However, financial coverage was highly uneven, large fractions of younger and middle-aged workers lack access to public benefits (Giles et al., 2006b). Even for those receiving funds, the actual amount was often far less than what was stipulated (Lee, 2000). Unemployment insurance (UI) program was established in 1999, which can be regarded as a second level of protection for the unemployed workers (Zhang, 2003). Workers who could not be reemployed within three years by referral through reemployment service centers would then be covered by UI. Displaced workers were expected to register with these newly established reemployment centers for job search assistance. There were both incomplete coverage and leakage problems as the registration
process was cumbersome and not well targeted. Thus, income of other household members was the most frequent source of private support for individuals experiencing job separations (Giles et al., 2006a). And personal networks played an important role in providing job information to displaced individuals (Giles et al., 2006b).

3 Literature Review

Models of family labor supply suggest that other family members may increase their labor supply when one family member becomes unemployed which reduces family income. The studies in the literature on the “added worker effect” (AWE) usually examine if there were a temporary increase in the labor supply of married women in response to their husbands’ unemployment, and married women are usually treated as “secondary worker” in the household (e.g., Lundberg, 1985; Maloney, 1987, 1991; Spletzer, 1997). The reduction in household income due to husbands’ unemployment provides an income effect on the wife to increase her labor supply. In addition, the increase in husband’s nonmarket time tends to reduce the relative value of the wife’s nonmarket time, so that the wife is more likely to join the labor force. However, empirical analysis has found small AWE using U.S. data (e.g., Lundberg, 1985; Spletzer, 1997; Cullen and Gruber, 2000), and sometimes no evidence of an effect (Maloney, 1987, 1991).

In a life-cycle model of family labor supply, the AWE is expected to be small when the unemployment is anticipated, unless there are credit constraints that limit borrowing against future income (Lundberg, 1985). Other reasons mentioned in previous literature include “assortative mating” in taste of work, and the “discouraged worker effect” (DWE), which means poor labor market conditions for husbands are correlated with poor conditions for the wives and
discourage wives from entering the labor force (e.g., Maloney, 1987, 1991; Spletzer, 1997). On
“assortative mating”, Juhn and Potter (2007) find positive co-movement of employment within
couples, although the AWE is still important among a subset of couples. Cullen and Gruber
(2000) point out that previous literature ignored the potentially important role of UI program.
They estimate the effect of UI during the spell of unemployment and find a strong “crowd out”
effect of UI on family self-insurance. Spousal labor supply only provides partial insurance
against family income losses even in the absence of UI.

Stephens (2002) focuses on the husbands’ displacement rather than unemployment for
analyzing the AWE. There have been numerous studies about the unemployment effects and
negative earnings effects of displacement. Displaced workers experience more non-employment
and have a substantially reduced probability of employment (e.g., Fallick, 1996; Farber, 2004).
Even after reemployment, their hourly wages are still 9% below expected level 6 or more years
after the job loss (Stevens, 1997). Stephens (2002) argues that displaced workers suffer from
substantial permanent earnings losses, while those quitting or seasonal employed may not have
their earnings adversely affected. He also analyzes wives’ responses before and after job losses
to examine the life-cycle labor supply adjustments and find significant long-run labor supply
increases.

In the context of developing countries, AWE is more likely to be important given the less
effective social insurance schemes and safety nets (Skoufias and Parker, 2006). Skoufias and
Parker (2006) find significant added-worker effects for adult females during the peso crisis in
Mexico. A study using survey conducted in Brazilian metropolitan areas reveal a more
significant AWE than those generally reported for the United States, which may suggest a
liquidity constraint might prevent Brazilian households when the head of the family is unemployed (Fernandes and Felício, 2005). Studies on this issue in developing countries are rare.

4 Data

This analysis uses China Urban Labor Survey (CULS), which was conducted at year-end 2001 in five large Chinese cities (Fuzhou, Shanghai, Shenyang, Wuhan and Xi’an). Giles et al. (2006a) have a detailed description of the survey since the authors collaborated in the design and execution of the survey. The CULS was conducted by the Institute for Population and Labor Economics at the Chinese Academy of Social Sciences, and provincial and municipal offices of the National Bureau of Statistics. It provides a detailed description of how shocks affected China’s workers during the restructuring period from 1996 to 2001. Surveys were conducted in 3,499 households (700 in each city), and completed surveys of 8,109 adults over 16. Each household head was asked questions about the family, and then all family members above the age of 16 who were no longer in school were interviewed individually. At the time of the survey, 5,787 adults were under mandatory retirement age and 4,238 were currently employed (Giles et al., 2006a).

The CULS obtains individual work histories on calendar base. Each individual was provided a calendar for the years 1996-2001 and was asked to recall his/her work status for each month in those years. Then, based on the calendar, an individual answered detailed questions about job changes, transitions to unemployment or retirement, changes in pension, health care and housing benefits, and access to government programs since January 1996. Like many multipurpose household surveys, it also includes questions on income, expenditure, housing and
consumer durables, productive assets and wealth, health and household demographics (Giles et al., 2006a).

The CULS includes the starting and ending year and month for each job an individual held between 1996 and 2001, as well as the average number of days worked in a week, the number of hours worked in a day, monthly wages, and reasons for job separations for each job. It also includes such information for part-time jobs the individual held beyond the main jobs. And for periods the individual was not working, the survey has questions on the reasons for being not working and if the individual was actively looking for a job. Then variables on annual working hours, employment status and job changes are created from these work histories.

Reasons for job separations include work unit closed, went bankrupt, was merged or reorganized, other involuntary dismissals, voluntary departure, mandatory retirement and other. Displacement is defined as involuntary job separation including work unit closed, went bankrupt, was merged or reorganized, and other involuntary dismissals.

For this analysis, the sample is restricted to wives between the ages of 25 and 50, and husbands between the ages 25 and 60, because the mandatory retirement age for most ordinary female workers is 50, for female cadres and those with advanced degrees is 55, and for men is 60 in China (Maurer-Fazio et al., 2011). The empirical analysis focuses on the wife’s (husband’s) response to the spouse’s first displacement between 1996 and 2001, and while the couple has been together. Multiple displacements would lead to persistent earnings and wages losses in the long-term (Stevens, 1997). But, less than 5% of the displaced workers in the sample experienced displacement more than once.

Retrospective data suffers from recall bias because respondents’ memory of displacement erodes over time. Evans and Leighton (1995) find a dramatic undercount of the number of
displaced workers in Displaced Worker Surveys (DWS), in which the recall period was five years, survey years 1984, 1986, 1988, and 1990. Oyer (2004) analyzes a survey that mimics the DWS, and finds that workers provide ambiguous explanations for job loss and slightly overstate pre-layoff earnings, but are accurate on the dates of employment. Since workers in China used to have the expectation of life-time employment, displacement would be a significant change in their life to remember. In addition, the CULS calendar-based work histories help to provide accurate answers to displacement dates. Therefore, I expect the retrospective bias would be small on displacement information. But some variables such as working hours are less accurate than using panel data that surveys annually.

5 Regression Framework

A life-cycle labor supply model with uncertainty described in Stephens (2002) assumes that the household maximizes joint utility, which depends on the leisure of both the husband and the wife. The household updates its expectations with new information it has received since the prior period and maximizes utility over the remainder of its lifetime. It is assumed that a displacement can be represented as a low wage realization that occurs in one period, and a spread-preserving reduction in the mean of all future wage offers, so not only the period of displacement is affected. Following Stephens (2002), a reduced-form regression model is

$$F_{it} = \varphi_{i} + \alpha_{t} + \sum_{k=k_{i}}^{k_{u}} \gamma_{k} D_{it}^{k} + X_{it} \beta + v_{it}$$

where $F_{it}$ is some measure of the wife’s labor supply, $\varphi_{i}$ is a household-specific effect, $\alpha_{t}$ is a year-specific effect, and $v_{it}$ is an individual- and year-specific error term. The variable $D_{it}^{k}$ receives a value of 1 if the worker is displaced $k$ periods before the current period; $k$ can also
take on negative values in order to capture the effects in the years before displacement. $X_{it}$ is a vector of variables that representing individual characteristics, including age, education, potential experience, and number of children by age group in the household.

Linear fixed-effects approach is adopted to eliminate the household-specific effect and generate baseline estimates. Since labor supply variable, i.e. annual working hours, could be zero for some individuals, Tobit model is also applied to deal with the censored dependent variable issue. Fixed-effects Tobit requires the number of time period $T$ to be large for consistency. Given the constructed panel from CULS only have six years, correlated random-effects Tobit estimates are reported. The correlated random-effects estimator requires a balanced panel. The restructuring of SOEs in China provided a large number of displacements in a relatively short period, which makes balancing the data possible without a severe reduction in sample size.

6 Results

6.1 Descriptive Statistics

Comparison of the characteristics of never displaced and displaced families are provided in Table 1. The first two columns of Table 1 compare the characteristics of wives in the year of the husband’s displacement with the average characteristics of those whose husband never experienced a displacement. The displaced families had slightly more members in the household. Wives in the displaced families were less than one year older and with more work experience, but with lower education level. They were also less likely to have a job and worked for fewer hours in the year the husband displaced, compared to the average working hours in the never displaced group. In fact, there were 32.4% wives in the husband displaced group working zero hours in the year of the husbands’ displacement, and 28.4% in the comparison group. The
displaced families also had less number of children, especially children under age 12\textsuperscript{1}. But for families in which the wife was displaced, some characteristics show the opposite. Husbands with displaced wives were younger, work more hours, and the household size was smaller.

Because female and male workers both experienced mass layoffs during the same period, wife’s response to husband’s job loss would be affected by the wife’s own displacement, vise versa. The contents in Table 2 exclude wives who themselves were displaced between 1996 and 2001 in the first two columns, and exclude husbands who themselves were displaced in the last two columns. The variable averages are similar to those presented in Table 1. Excluding those samples resulted in a large reduction in the sample size. However, the inclusion of these samples in the analysis would affect the results negatively, showing the effect of involuntary losses in hours of work instead of labor supply decisions. So these samples are excluded from the regressions in this analysis, and the results in the regressions that use the smaller sample should be interpreted with this in mind. About 40% of the couples who both experienced displacement had worked in the same work unit, compared to 20% in same work unit in families where there was only one member displaced.

6.2 Regression Analysis

The estimates of annual working hours using the full sample are provided in Table 3. The OLS columns provide linear fixed-effects estimators. Wives’ responses to husbands’ displacements are shown in the first column. Although the coefficients on dummies two to four years after the displacement are positive, they are not statistically significant. And the

\footnote{For displaced families in the sample, children under 12 is not observed in the first column, and children under 6 is not observed in the third column. This is probably due to the small sample size and low birth rate in China during that period. Also, women in these displaced families seem to have children early, as the number of children between 12 & 18 is much higher than other categories.}
coefficients on dummies that represent years before displacement are large and positive. Tobit estimates are in column two, accompanied by the marginal effects in column three, which are derived by multiplying the coefficient by the proportion of non-limit observations, P=0.700 for wives, and P=0.855 for husbands. The last three columns in Table 3 show the coefficients for husbands’ responses to wives’ displacement. The pre-displacement effects are positive, and the post-displacement ones are negative, which due to the inclusion of husbands who themselves got displaced and their working hours reduced.

Estimates using the smaller sample that excludes those who themselves were displaced, are given in Table 4. Comparing to the year of displacement, wives’ annual hours of work were lower in the one to three years before the husbands’ displacement. OLS coefficients are statistically significant in the years following the displacement, ranging from 95 hours to 218 hours in magnitude. Given the average annual hours about 1260 hours for the wives in the year of husband displacement, the increases in working hours would be between 7.6 to 17 percent. The increasing pattern is consistent with theoretical predictions. Tobit estimates and marginal effects are also presented in the table, which show similar pattern as the OLS estimates. Marginal effects are derived by multiplying the coefficient by the proportion of non-limit observations again, with P=0.705 for women, and P=0.871 for men. Husbands’ responses to wives’ displacement were much smaller and not statistically significant.

Table 5 presents estimates of annual work hours with some displacement-year dummies combined. The displacement variables are Three and More Years Before Displacement, One to Two Years Before, One to Two Years After, and Three and More Years After, and the coefficients show the average effects among those years. The pattern again shows significant relative increase in wives’ working hours after husbands’ displacement. Increases in husbands’
labor supply were not significant, which may due to the fact that husbands’ were already working long hours, and there was little room for them to increase.

Another measure used for labor supply is the number of months worked in one year, which gives similar pattern but very few estimates were significant (Table 6). Choosing this measure is because each month’s working status could be obtained directly from the CULS calendar-based questions, which seems more reliable than the calculated annual hours of work. The magnitudes of the coefficients range from about 0.2 month to 0.7 month, or about 6 to 20 days. Assuming 8 hours of work per day, increases in hours would be close to estimates on annual hours.

To test the effect of displacement benefits on spousal labor supply, interaction of displacement dummies with access to benefits could be included in the regression model. Access to benefits is likely to be relatively exogenous after conditioning on individual characteristics. When required to provide benefits, employers are obligated to provide them to all eligible dislocated workers regardless of their ability (Giles et al., 2006b). There are two questions in CULS; one of them asked if the displaced worker received lump-sum compensation at the time of job separation, the other asked if the displaced worker received money to support reemployment. Using whether or not the displaced spouse received compensation or support from reemployment centers, I find wives with displaced husbands’ who received benefits would work less hours than those whose husbands’ did not receive them, at the same time, the post-displacement coefficients become more significant. The coefficients for husbands’ with displaced wives are not significant, although showing the same sign. Table 7 provides estimates of the “crowding out” effects of displacement benefits.
Table 8 presents estimates of annual hours when the interaction of displacement dummies with the displaced worker’s previous tenure are included in the linear regression. Workers with long tenures may suffer more earnings losses as wages were higher for long-tenured workers, and they may lose their specific human capital when they have to change occupation or industry after a job loss. However, the estimates of annual hours fail to be statistically significant when tenure is included for wives’ with displaced husbands. Tenure effects on annual hours for husbands with displaced wives are also small in magnitude. Tenure was not playing a clear role in increasing spouse labor supply for displaced workers. This may be correlated to how workers with different tenure were treated when being laid off. As reported in Giles et al. (2006b), young and middle-aged workers lack access to public benefits, but older workers are more likely to receive benefits which compensate losses associated with long tenure.

7 Conclusion

The restructuring in China in the late 1990s resulted in large number of displacement among urban workers. Displaced workers suffer from earning losses and long-term unemployment. At the household level, other family members, especially spouse of the displaced worker, would increase his/her labor supply theoretically. Using CULS data, I examine if such an added worker effect exists in China. Following the methodology adopted by Stephens (2002), I find wives would increase their hours of work in the case of husbands’ displacement. However, husbands’ responses are not significant to wives’ displacement. Receiving unemployment benefits would reduce wives’ labor supply. The inclusion of tenure provides no significant results, which may worth further exploration. The results are based on excluding individuals who themselves experienced displacement. Further work could be on how to better cope with such involuntary job separations.
Reference


Table 1: Comparison of Never Displaced and Displaced Families by Gender

<table>
<thead>
<tr>
<th>Variables</th>
<th>Wives</th>
<th>Husbands</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Husband</td>
<td>Husband Never</td>
</tr>
<tr>
<td>Household size</td>
<td>2.442</td>
<td>2.366</td>
</tr>
<tr>
<td>Age</td>
<td>39.399</td>
<td>38.761</td>
</tr>
<tr>
<td>Education</td>
<td>9.686</td>
<td>10.201</td>
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<td>Experience</td>
<td>10.009</td>
<td>9.691</td>
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<tr>
<td>Annual Working Hours</td>
<td>1276.940</td>
<td>1436.254</td>
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<td>Have Job(=1)</td>
<td>0.686</td>
<td>0.716</td>
</tr>
<tr>
<td>Months Working in One Year</td>
<td>7.168</td>
<td>8.186</td>
</tr>
<tr>
<td>Children Under 6</td>
<td>0.000</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>Between 6 &amp; 12</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Between 12 &amp; 18</td>
<td>0.184</td>
</tr>
<tr>
<td></td>
<td>Between 18 &amp; 24</td>
<td>0.099</td>
</tr>
<tr>
<td></td>
<td>25 and Older</td>
<td>0.025</td>
</tr>
<tr>
<td>Number of Individuals</td>
<td>283</td>
<td>1392</td>
</tr>
<tr>
<td>Number of Observations</td>
<td>8352</td>
<td>10632</td>
</tr>
</tbody>
</table>

Notes: 1. Using only the spouse’s first displacement between 1996 and 2001. Averages are for the year of displacement.

2. Averages include all observations for every woman whose husband was never displaced.

3. Averages include all observations for every man whose wife was never displaced.
Table 2: Comparison of Never Displaced and Displaced Families by Gender, Smaller Sample

<table>
<thead>
<tr>
<th>Variables</th>
<th>Wives Who Themselves Never Displaced</th>
<th>Husbands Who Themselves Never Displaced</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Husband Displaced&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Husband Never Displaced&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Household size</td>
<td>2.444</td>
<td>2.369</td>
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<tr>
<td>Age</td>
<td>39.633</td>
<td>38.739</td>
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<tr>
<td>Education</td>
<td>9.606</td>
<td>10.282</td>
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<tr>
<td>Experience</td>
<td>10.994</td>
<td>9.929</td>
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<td>Annual Working Hours</td>
<td>1259.578</td>
<td>1463.312</td>
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<tr>
<td>Have Job(=1)</td>
<td>0.633</td>
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<tr>
<td>Months Working in One Year</td>
<td>7.122</td>
<td>8.370</td>
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<td>Children Under 6</td>
<td>0.000</td>
<td>0.006</td>
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<tr>
<td>Between 6 &amp; 12</td>
<td>0.000</td>
<td>0.010</td>
</tr>
<tr>
<td>Between 12 &amp; 18</td>
<td>0.167</td>
<td>0.118</td>
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<tr>
<td>Between 18 &amp; 24</td>
<td>0.117</td>
<td>0.121</td>
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<tr>
<td>25 and Older</td>
<td>0.022</td>
<td>0.032</td>
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<tr>
<td>Number of Individuals</td>
<td>180</td>
<td>1159</td>
</tr>
<tr>
<td>Number of Observations</td>
<td>6954</td>
<td>9348</td>
</tr>
</tbody>
</table>

Notes: 1. Individuals who themselves experienced displacement between 1996 and 2001 were excluded.

2. Using only the spouse’s first displacement between 1996 and 2001. Averages are for the year of displacement.

3. Averages include all observations for every woman whose husband was never displaced.

4. Averages include all observations for every man whose wife was never displaced.
Table 3: Estimates of Annual Working Hours by Gender

<table>
<thead>
<tr>
<th>Variables</th>
<th>Wives OLS</th>
<th>Tobit</th>
<th>Marginal Effect</th>
<th>Husbands OLS</th>
<th>Tobit</th>
<th>Marginal Effect</th>
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</thead>
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<tr>
<td>Five Years Before</td>
<td>359.942**</td>
<td>409.104***</td>
<td>286.373</td>
<td>113.496</td>
<td></td>
<td>104.020</td>
</tr>
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<td>Spouse Displacement</td>
<td>(151.939)</td>
<td>(146.743)</td>
<td></td>
<td>(109.709)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Four Years Before</td>
<td>265.083***</td>
<td>273.627***</td>
<td>191.539</td>
<td>66.307</td>
<td></td>
<td>58.863</td>
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<td></td>
<td>(98.453)</td>
<td>(99.643)</td>
<td></td>
<td>(88.505)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three Years Before</td>
<td>167.051**</td>
<td>153.118*</td>
<td>107.183</td>
<td>136.921**</td>
<td>138.242**</td>
<td>118.197</td>
</tr>
<tr>
<td></td>
<td>(75.855)</td>
<td>(83.367)</td>
<td></td>
<td>(66.389)</td>
<td>(56.631)</td>
<td></td>
</tr>
<tr>
<td>Two Years Before</td>
<td>98.730</td>
<td>80.874</td>
<td>56.612</td>
<td>53.877</td>
<td></td>
<td>46.919</td>
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<tr>
<td></td>
<td>(62.933)</td>
<td>(72.532)</td>
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<td>(46.720)</td>
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<tr>
<td>One Year Before</td>
<td>77.029</td>
<td>56.142</td>
<td>39.299</td>
<td>52.708</td>
<td></td>
<td>38.651</td>
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<td>(35.206)</td>
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<td>One Year After</td>
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<td>-50.871</td>
<td>-47.040</td>
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<td>(66.599)</td>
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<td>(35.533)</td>
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<tr>
<td>Two Years After</td>
<td>54.293</td>
<td>20.483</td>
<td>14.338</td>
<td>-88.542*</td>
<td>-126.338***</td>
<td>-108.019</td>
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<tr>
<td></td>
<td>(72.541)</td>
<td>(73.253)</td>
<td></td>
<td>(50.952)</td>
<td>(46.131)</td>
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<td>Three Years After</td>
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<td>-71.703</td>
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<td></td>
<td>(96.418)</td>
<td>(83.024)</td>
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<td>(55.930)</td>
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<tr>
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<td>88.064</td>
<td>74.299</td>
<td>52.009</td>
<td>-90.254</td>
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<td>-102.036</td>
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<tr>
<td></td>
<td>(110.003)</td>
<td>(101.815)</td>
<td></td>
<td>(66.435)</td>
<td>(60.733)</td>
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</tr>
<tr>
<td>Five Years After</td>
<td>-41.119</td>
<td>-94.051</td>
<td>-65.836</td>
<td>2.603</td>
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<td>-5.386</td>
</tr>
<tr>
<td></td>
<td>(143.512)</td>
<td>(145.189)</td>
<td></td>
<td>(80.657)</td>
<td>(78.510)</td>
<td></td>
</tr>
</tbody>
</table>

Number of Obs | 10,050     | 10,050     | 12,750          | 12,750       |

Notes: 1. Robust standard errors in parentheses
2. *** p<0.01, ** p<0.05, * p<0.1
3. All OLS regressions are using fixed-effect approach. All regressions also include year effects and control variables. Control variables include year of education, age, age squared, experience, experience squared, and number of children by age groups.

4. Marginal effects are derived by multiplying the coefficient by the proportion of non-limit observations, P=0.700 for wives, and P=0.855 for husbands.

5. Number of Observations by year to displacement is in Table A1.
Table 4: Estimates of Annual Working Hours by Gender, Smaller Sample

<table>
<thead>
<tr>
<th>Variables</th>
<th>Wives</th>
<th>dine</th>
<th>Husbands</th>
<th>Husbands</th>
</tr>
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<tr>
<td></td>
<td>OLS</td>
<td>Tobit</td>
<td>Marginal</td>
<td>OLS</td>
</tr>
<tr>
<td>Spouse Displacement</td>
<td>78.168</td>
<td>38.836</td>
<td>27.379</td>
<td>72.656</td>
</tr>
<tr>
<td></td>
<td>(156.464)</td>
<td>(154.033)</td>
<td>(111.501)</td>
<td>(95.793)</td>
</tr>
<tr>
<td>Five Years Before</td>
<td>52.772</td>
<td>14.831</td>
<td>10.456</td>
<td>30.583</td>
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<tr>
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<td>(108.267)</td>
<td>(106.716)</td>
<td>(92.256)</td>
<td>(65.425)</td>
</tr>
<tr>
<td>Spouse Displacement</td>
<td>-16.075</td>
<td>-81.472</td>
<td>-57.438</td>
<td>71.035</td>
</tr>
<tr>
<td></td>
<td>(73.454)</td>
<td>(89.936)</td>
<td>(57.888)</td>
<td>(56.855)</td>
</tr>
<tr>
<td>Four Years Before</td>
<td>-43.720</td>
<td>-115.696</td>
<td>-81.566</td>
<td>-4.982</td>
</tr>
<tr>
<td></td>
<td>(52.263)</td>
<td>(79.258)</td>
<td>(39.098)</td>
<td>(49.039)</td>
</tr>
<tr>
<td>Three Years Before</td>
<td>-40.498</td>
<td>-100.131</td>
<td>-70.592</td>
<td>-4.619</td>
</tr>
<tr>
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<td>(48.540)</td>
<td>(72.391)</td>
<td>(27.566)</td>
<td>(44.117)</td>
</tr>
<tr>
<td>Two Years Before</td>
<td>95.076**</td>
<td>85.166</td>
<td>60.042</td>
<td>3.447</td>
</tr>
<tr>
<td></td>
<td>(45.291)</td>
<td>(72.096)</td>
<td>(22.482)</td>
<td>(42.029)</td>
</tr>
<tr>
<td>One Year Before</td>
<td>129.440*</td>
<td>134.149*</td>
<td>94.575</td>
<td>30.207</td>
</tr>
<tr>
<td></td>
<td>(69.247)</td>
<td>(79.313)</td>
<td>(31.391)</td>
<td>(46.009)</td>
</tr>
<tr>
<td>One Year After</td>
<td>185.678*</td>
<td>207.001**</td>
<td>145.936</td>
<td>42.786</td>
</tr>
<tr>
<td></td>
<td>(99.921)</td>
<td>(89.733)</td>
<td>(38.777)</td>
<td>(49.733)</td>
</tr>
<tr>
<td>Three Years After</td>
<td>217.706*</td>
<td>272.887**</td>
<td>192.385</td>
<td>76.730</td>
</tr>
<tr>
<td></td>
<td>(119.274)</td>
<td>(108.845)</td>
<td>(46.853)</td>
<td>(57.550)</td>
</tr>
<tr>
<td>Two Years After</td>
<td>184.999</td>
<td>273.107*</td>
<td>192.540</td>
<td>94.714</td>
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<tr>
<td></td>
<td>(145.243)</td>
<td>(153.376)</td>
<td>(61.515)</td>
<td>(72.931)</td>
</tr>
</tbody>
</table>

Number of Obs 8,034 8,034 10,818 10,818

Notes: 1. Robust standard errors in parentheses
2. *** p<0.01, ** p<0.05, * p<0.1
3. All OLS regressions are using fixed-effect approach. All regressions also include year effects and control variables. Control variables include year of education, age, age squared, experience, experience squared, and number of children by age groups.
4. Marginal effects are derived by multiplying the coefficient by the proportion of non-limit observations, P=0.705 for wives, and P=0.871 for husbands.
Table 5: Estimates of Annual Working Hours by Gender, Smaller Sample, Years Combined

<table>
<thead>
<tr>
<th>Variables</th>
<th>Wives</th>
<th></th>
<th>Husbands</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OLS</td>
<td>Tobit</td>
<td>Marginal Effect</td>
<td>OLS</td>
</tr>
<tr>
<td>Three and More Years Before</td>
<td>18.295</td>
<td>-32.325</td>
<td>-22.789</td>
<td>60.511</td>
</tr>
<tr>
<td>Displacement</td>
<td>(82.170)</td>
<td>(76.860)</td>
<td>(67.556)</td>
<td>(47.819)</td>
</tr>
<tr>
<td>One to Two Years Before</td>
<td>-41.496</td>
<td>-104.951*</td>
<td>-73.990</td>
<td>-2.134</td>
</tr>
<tr>
<td></td>
<td>(45.819)</td>
<td>(63.117)</td>
<td>(30.445)</td>
<td>(38.426)</td>
</tr>
<tr>
<td>One to Two Years After</td>
<td>111.569**</td>
<td>108.075*</td>
<td>76.193</td>
<td>14.191</td>
</tr>
<tr>
<td></td>
<td>(49.457)</td>
<td>(62.976)</td>
<td>(24.312)</td>
<td>(36.686)</td>
</tr>
<tr>
<td>Three and More Years After</td>
<td>194.944*</td>
<td>234.010***</td>
<td>164.977</td>
<td>60.357</td>
</tr>
<tr>
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<td>(99.398)</td>
<td>(76.993)</td>
<td>(40.519)</td>
<td>(42.161)</td>
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<td>Number of Obs</td>
<td>8,034</td>
<td>8,034</td>
<td>10,818</td>
<td>10,818</td>
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</table>

Notes: 1. Robust standard errors in parentheses
2. *** p<0.01, ** p<0.05, * p<0.1
3. All OLS regressions are using fixed-effect approach. All regressions also include year effects and control variables. Control variables include year of education, age, age squared, experience, experience squared, and number of children by age groups.
4. Marginal effects are derived by multiplying the coefficient by the proportion of non-limit observations, P=0.705 for wives, and P=0.871 for husbands.
Table 6: Estimates of Number of Months Working in One Year by Gender

<table>
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<tr>
<th>Variables</th>
<th>Wives OLS</th>
<th>Wives Tobit</th>
<th>Wives Marginal Effect</th>
<th>Husbands OLS</th>
<th>Husbands Tobit</th>
<th>Husbands Marginal Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five Years Before Spouse Displacement</td>
<td>0.240</td>
<td>0.022</td>
<td>0.016</td>
<td>0.430</td>
<td>0.494</td>
<td>0.430</td>
</tr>
<tr>
<td></td>
<td>(0.848)</td>
<td>(0.776)</td>
<td></td>
<td>(0.605)</td>
<td>(0.434)</td>
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<tr>
<td>Four Years Before</td>
<td>0.232</td>
<td>0.023</td>
<td>0.016</td>
<td>0.113</td>
<td>0.211</td>
<td>0.184</td>
</tr>
<tr>
<td></td>
<td>(0.556)</td>
<td>(0.536)</td>
<td></td>
<td>(0.372)</td>
<td>(0.296)</td>
<td></td>
</tr>
<tr>
<td>Three Years Before</td>
<td>-0.076</td>
<td>-0.418</td>
<td>-0.295</td>
<td>0.269</td>
<td>0.336</td>
<td>0.293</td>
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<tr>
<td></td>
<td>(0.382)</td>
<td>(0.452)</td>
<td></td>
<td>(0.263)</td>
<td>(0.257)</td>
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</tr>
<tr>
<td>Two Years Before</td>
<td>-0.235</td>
<td>-0.591</td>
<td>-0.417</td>
<td>-0.014</td>
<td>0.034</td>
<td>0.030</td>
</tr>
<tr>
<td></td>
<td>(0.305)</td>
<td>(0.397)</td>
<td></td>
<td>(0.188)</td>
<td>(0.221)</td>
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</tr>
<tr>
<td>One Year Before</td>
<td>-0.181</td>
<td>-0.498</td>
<td>-0.351</td>
<td>-0.043</td>
<td>-0.016</td>
<td>-0.014</td>
</tr>
<tr>
<td></td>
<td>(0.259)</td>
<td>(0.362)</td>
<td></td>
<td>(0.124)</td>
<td>(0.199)</td>
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</tr>
<tr>
<td>One Year After</td>
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<td>0.181</td>
<td>0.128</td>
<td>0.049</td>
<td>0.054</td>
<td>0.047</td>
</tr>
<tr>
<td></td>
<td>(0.197)</td>
<td>(0.361)</td>
<td></td>
<td>(0.105)</td>
<td>(0.189)</td>
<td></td>
</tr>
<tr>
<td>Two Years After</td>
<td>0.341</td>
<td>0.193</td>
<td>0.136</td>
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<td>0.234</td>
</tr>
<tr>
<td></td>
<td>(0.255)</td>
<td>(0.398)</td>
<td></td>
<td>(0.170)</td>
<td>(0.207)</td>
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<tr>
<td>Three Years After</td>
<td>0.702*</td>
<td>0.641</td>
<td>0.452</td>
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<td>0.319</td>
<td>0.278</td>
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<tr>
<td></td>
<td>(0.416)</td>
<td>(0.449)</td>
<td></td>
<td>(0.213)</td>
<td>(0.224)</td>
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</tr>
<tr>
<td>Four Years After</td>
<td>0.651</td>
<td>0.658</td>
<td>0.464</td>
<td>0.511**</td>
<td>0.566**</td>
<td>0.493</td>
</tr>
<tr>
<td></td>
<td>(0.591)</td>
<td>(0.545)</td>
<td></td>
<td>(0.248)</td>
<td>(0.259)</td>
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</tr>
<tr>
<td>Five Years After</td>
<td>0.790</td>
<td>1.051</td>
<td>0.741</td>
<td>0.590**</td>
<td>0.655**</td>
<td>0.571</td>
</tr>
<tr>
<td></td>
<td>(0.882)</td>
<td>(0.770)</td>
<td></td>
<td>(0.292)</td>
<td>(0.327)</td>
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</tr>
</tbody>
</table>

Number of Obs 8,034 8,034 10,818 10,818

Notes: 1. Robust standard errors in parentheses
2. *** p<0.01, ** p<0.05, * p<0.1
3. All OLS regressions are using fixed-effect approach. All regressions also include year effects and control variables. Control variables include year of education, age, age squared, experience, experience squared, and number of children by age groups.

4. Marginal effects are derived by multiplying the coefficient by the proportion of non-limit observations, P=0.705 for wives, and P=0.871 for husbands.
Table 7: Estimates of Annual Working Hours, Effects of Displacement Benefits

<table>
<thead>
<tr>
<th>Variables</th>
<th>Wives OLS</th>
<th>Husbands OLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three and More Years Before Displacement</td>
<td>8.380</td>
<td>61.893</td>
</tr>
<tr>
<td></td>
<td>(82.250)</td>
<td>(67.692)</td>
</tr>
<tr>
<td>One to Two Years Before</td>
<td>-38.904</td>
<td>-2.069</td>
</tr>
<tr>
<td></td>
<td>(45.416)</td>
<td>(30.311)</td>
</tr>
<tr>
<td>One to Two Years After</td>
<td>148.845***</td>
<td>41.983</td>
</tr>
<tr>
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<td>(56.329)</td>
<td>(30.204)</td>
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<tr>
<td>Three and More Years After</td>
<td>244.606**</td>
<td>69.194</td>
</tr>
<tr>
<td></td>
<td>(104.736)</td>
<td>(48.273)</td>
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</table>

Interaction With Receiving Displacement Benefits (=1):

<table>
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<th>Variables</th>
<th>Wives OLS</th>
<th>Husbands OLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three and More Years Before</td>
<td>28.346</td>
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</tr>
<tr>
<td></td>
<td>(162.427)</td>
<td></td>
</tr>
<tr>
<td>One to Two Years Before</td>
<td>-298.897</td>
<td>-23.092</td>
</tr>
<tr>
<td></td>
<td>(313.126)</td>
<td>(46.265)</td>
</tr>
<tr>
<td>One to Two Years After</td>
<td>-258.276*</td>
<td>-139.451</td>
</tr>
<tr>
<td></td>
<td>(152.953)</td>
<td>(98.142)</td>
</tr>
<tr>
<td>Three and More Years After</td>
<td>-598.115**</td>
<td>-45.961</td>
</tr>
<tr>
<td></td>
<td>(271.133)</td>
<td>(88.815)</td>
</tr>
</tbody>
</table>

Number of Obs

<table>
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<th></th>
<th>Wives</th>
<th>Husbands</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8,034</td>
<td>10,818</td>
</tr>
</tbody>
</table>

Notes: 1. Robust standard errors in parentheses
2. *** p<0.01, ** p<0.05, * p<0.1
3. All OLS regressions are using fixed-effect approach. All regressions also include year effects and control variables. Control variables include year of education, age, age squared, experience, experience squared, and number of children by age groups.
Table 8: Estimates of Annual Working Hours, Effects of Spouse’s Tenure

<table>
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<th>Wives OLS</th>
<th>Husbands OLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three and More Years Before Displacement</td>
<td>-141.848</td>
<td>206.386**</td>
</tr>
<tr>
<td></td>
<td>(125.214)</td>
<td>(84.554)</td>
</tr>
<tr>
<td>One to Two Years Before</td>
<td>-1.163</td>
<td>-17.158</td>
</tr>
<tr>
<td></td>
<td>(106.496)</td>
<td>(75.226)</td>
</tr>
<tr>
<td>Three and More Years After</td>
<td>104.768</td>
<td>-81.099</td>
</tr>
<tr>
<td></td>
<td>(109.142)</td>
<td>(74.235)</td>
</tr>
<tr>
<td>Interaction With Spouse’s Tenure:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three and More Years Before</td>
<td>7.763</td>
<td>-8.941*</td>
</tr>
<tr>
<td></td>
<td>(6.961)</td>
<td>(4.973)</td>
</tr>
<tr>
<td>One to Two Years Before</td>
<td>-7.283</td>
<td>1.747</td>
</tr>
<tr>
<td></td>
<td>(6.061)</td>
<td>(4.458)</td>
</tr>
<tr>
<td>Three and More Years After</td>
<td>0.230</td>
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</tr>
<tr>
<td></td>
<td>(8.116)</td>
<td>(5.384)</td>
</tr>
</tbody>
</table>

Number of Obs: 8,034, 10,818

Notes: 1. Robust standard errors in parentheses
2. *** p<0.01, ** p<0.05, * p<0.1
3. All OLS regressions are using fixed-effect approach. All regressions also include year effects and control variables. Control variables include year of education, age, age squared, experience, experience squared, and number of children by age groups.
Figure 1: Urban Employment 1993-2001 (Millions)

<table>
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<tr>
<th></th>
<th>All</th>
<th>Individuals Who Themselves Never Displaced</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Together</td>
</tr>
<tr>
<td>Five Years Before Spouse Displacement (=1)</td>
<td>72</td>
<td>54</td>
</tr>
<tr>
<td>Four Years Before</td>
<td>185</td>
<td>130</td>
</tr>
<tr>
<td>Three Years Before</td>
<td>287</td>
<td>189</td>
</tr>
<tr>
<td>Two Years Before</td>
<td>406</td>
<td>264</td>
</tr>
<tr>
<td>One Year Before</td>
<td>515</td>
<td>338</td>
</tr>
<tr>
<td>Year of Displacement</td>
<td>636</td>
<td>425</td>
</tr>
<tr>
<td>One Year After</td>
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<td>371</td>
</tr>
<tr>
<td>Two Years After</td>
<td>451</td>
<td>295</td>
</tr>
<tr>
<td>Three Years After</td>
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<td>236</td>
</tr>
<tr>
<td>Four Years After</td>
<td>230</td>
<td>161</td>
</tr>
<tr>
<td>Five Years After</td>
<td>121</td>
<td>87</td>
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</table>