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For Peer Review

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22 **Abstract:** That displaced workers suffer long-lasting earnings losses is a stylized
23 fact, raising the question whether these losses are replaced by other means. For
24 married men, increased labour supply by the wife may be one way. Another
25 possibility is that the public welfare system offsets the same losses. I used a Swedish
26 longitudinal data set containing married couples where the husband was either
27 employed or made redundant in 1987 by an establishment closure. There was no
28 evidence that husbands' job loss positively affected wives' annual earnings.
29 Although husbands' utilization of unemployment insurance increased significantly,
30 government transfers including also sickness insurance, disability insurance, and
31 means-tested social benefits, did not fully replace husbands' long-run earnings
32 losses. Hence, displaced workers seem to suffer also from long-lasting losses in
33 family income, which in many respects is a better measure of economic welfare than
34 individual earnings or wages.
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39 **JEL Classification:** J63, J65, J22, I38, J12
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41 **Keywords:** Job displacement, added-worker effect, social security, income
42 replacement, plant closure
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1 Introduction

This paper examines the long-run effects of job displacement in Sweden on family income and on potential income replacement by increased spousal earnings and welfare state transfers. Several studies, during the last two decades, have shown that the earnings losses from job loss are not only temporary but last for many years (Ruhm, 1991; Jacobson et al., 1993; Stevens, 1997; Couch, 2001; Eliason & Storrie, 2006). That job loss seems to lower earnings persistently raises the question whether displaced workers are compensated by other means. One possible source of income replacement, for couples, is that the spouse enters the labour market or if already working increases the number of working hours (i.e., an “added worker effect”). Previous empirical literature on the added-worker effect (e.g., Lundberg, 1985; Maloney, 1987, 1991; Seitchik, 1991; Cullen & Gruber, 2000; Prieto-Rodríguez & Rodríguez-Gutiérrez, 2000; Nilsson, 2008) has shown that this possible source of income replacement within the family does not seem to be utilized to any larger extent or that the spouse face such employment constraints that this is not a viable option.¹

Another potential source of income replacement is social security; and, most importantly, for displaced workers unemployment insurance. However, the unemployment insurance is designed to cover income losses during a transitional period of unemployment, but as discussed above displaced workers suffer long-lasting earnings losses, i.e., even after re-employment they have lower levels of

¹ Most of this literature have focused on wives’ labour supply response to their husband’s *current* unemployment, and have then ignored any response before or after the occurrence of job loss. An exception is Stephens (2002) who showed that long-run increases in spousal labour supply compensated for over 25 percent of husbands’ lost income due to job displacement.

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3 earning than they otherwise would have had. There are other compensation schemes,
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5 however, for workers temporarily, or permanently, out of employment, such as
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7 disability and sickness insurance, and means-tested social benefits.
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10 Relatively little is known about the impact of job displacement on a household's
11
12 economic well-being apart from the impact on the displaced workers' own earnings
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14 or wages. Even though studies focusing on wages, or earnings, have had a central
15
16 role in the displaced worker literature, family income may in many respects be a
17
18 better measure of economic welfare (Björklund & Palme, 2000; Seitchik, 1991). Two
19
20 US studies have previously investigated the impact on family income. Stephens
21
22 (2001) showed that total family income was less volatile than the head's earnings
23
24 following job displacement and that focusing on individual income or earnings will
25
26 overestimate the overall impact on economic wellbeing. Seitchik (1991) found that
27
28 both increased spousal earnings and government transfers replaced some of the
29
30 displaced husband's earnings, but that the replacement rate on average was rather
31
32 small.
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38 The current study differs from previous work in several respects. It focuses solely
39
40 on job displacement due to plant (i.e., establishment) closure. A plant closure can be
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42 viewed, at least to some extent, as a natural experiment as all workers are laid off
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44 irrespective of their characteristics. Thus, one is more likely to estimate causal
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46 effects of job loss not contaminated by selection bias. I will also explicitly
47
48 investigate the impact of husbands' job displacement not only on family income but
49
50 on several potential sources of income replacement: increased earnings by the wife;
51
52 both spouses' utilization of unemployment insurance, sickness insurance, and
53
54 disability insurance, as well as family means-tested social assistance. Moreover, a
55
56 Swedish longitudinal data set is used and as Sweden has been pointed to as an
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3 example of the universal welfare state in practice (Esping-Andersen, 1990) this may
4
5 produce different findings from those in, for example, the US. Moreover, the high
6
7 female labour force participation in Sweden, and that both spouses are expected to be
8
9 self-supportive within marriage, may suggest that the labour supply of married
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11 women in Sweden is even less responsive than elsewhere to changes in their
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13 husband's earnings.
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20 **2 The Swedish labour market and social security system**

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22 During the period under study, dramatic changes took place in the state of the
23
24 Swedish labour market, which needs to be borne in mind when interpreting the
25
26 results. Below, I will give a very brief description of the Swedish labour market and
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28 of each of the income compensation schemes.
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34 **2.1 The Swedish labour market²**

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36 In 1987 when the job losses occurred, Sweden was in a period of remarkably low
37
38 unemployment. The unemployment rate had been falling since 1983 and in 1989 it
39
40 was down at 1.5 percent, while the employment rate, during the same period, rose
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42 continually from 79.0 to 82.9 percent. During the years that followed, Sweden
43
44 experienced the most severe recession since the 1930s. The unemployment rate rose
45
46 to 8.2 percent in 1993 and stayed about this level until 1997, and the employment
47
48 rate fell by more than ten percentage points to 72.6 percent. Thus, the displaced
49
50 workers faced a very buoyant labour market at the time of the job loss, with good
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52 opportunities to find new jobs quickly, before they had to face the impending
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54 recession.
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² See Holmlund (2003) for more details.

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3 Sweden is also internationally recognized for its high degree of women in the labour
4 force. During these years, the labour force participation was almost as high for
5 women as for men and in 1990 it peaked at 82.3 percent after rising for decades. The
6 increase was then halted by the economic crisis and subsequently fell to 73.9 percent
7 in 1998. Similarly, the female employment rate fell from 81.0 percent in 1990 to 69.4
8 percent in 1998. Although there were only small differences between the
9 employment rates of men and women, it should be noted that the employed women
10 were mainly working part time.
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25 **2.2 The Swedish social security system³**

26 The social security system in Sweden aims at providing universal financial security
27 and its structure is potentially of significant importance for both the labour supply
28 response of married women to their husbands' job loss, or unemployment, and the
29 real economic losses for families experiencing job loss. The social security system
30 offers four income sources of particular interest for displaced workers in working
31 ages: unemployment insurance, sickness insurance, disability insurance, and means-
32 tested social assistance.⁴
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43 Unemployment insurance is, of course, the key welfare state transfer for job losers
44 of working age. It will not only reduce income losses during periods of
45 unemployment, but it may also reduce the longer-term impact of job loss by allowing
46 for extended job search resulting in better-quality matches. Payment of
47 unemployment insurance is conditional on registration with the public employment
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55 ³ See Bergmark and Palme (2003) or Sjögren Lindquist and Wadensjö (2006) for a more thorough
56 description of the development and details of the Swedish social security system.
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59 ⁴ Unemployment insurance is actually not a part of the social insurance system in Sweden but comes
60 under labour market policy.

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3 service and the recipient must be available for work and actively seek job.
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5 Entitlement is also associated with a work condition. Those not qualified for
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7 unemployment insurance could be granted unemployment assistance instead. During
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9 the time period covered here the unemployment insurance system was changed
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11 several times and the benefit level varied between 80 and 90 percent of previous
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13 earnings up to a ceiling.
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17 Considering the massive literature showing an association between job loss
18
19 (unemployment) and ill health,⁵ sickness and disability insurance may also be
20
21 important sources of income amongst displaced workers. Sickness insurance is
22
23 payable in cases of temporary illness that reduces working capacity. Just like the
24
25 unemployment insurance, it replaces a share of lost earnings up to a ceiling and for
26
27 most of the period the replacement ratio was the same as for the unemployment
28
29 insurance, whereas the ceiling has consistently been higher.
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34 In case of a more permanently reduced working capacity, a person could be
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36 eligible for disability insurance. However, until 1991 persons aged at least 60 years
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38 could also be granted disability insurance for labour market reasons only and until
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40 1997 for a combination of health and labour market reasons. Thereafter, only
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42 medical reasons for the reduced working capacity should be considered. The income
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44 ceiling for disability insurance has been the same as for sickness insurance, but the
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46 replacement rate has been lower.
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51 Finally, means-tested social assistance will be the ultimate safety net for those
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53 otherwise unable to make a living. It is means-tested on a household basis and is
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55 supposed to guarantee a “reasonable standard of living.” To be entitled to social
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⁵ See Kasl and Jones (2000) for a review.

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3 assistance, one should be unable to make a living on not only work, unemployment
4 insurance, and other benefits, but also on assets.
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8 In addition to the social security schemes mentioned above, there are a number of
9 supplementary schemes for unemployed workers. Initially, displaced workers have a
10 stipulated right to a paid wage for a certain period after given notice. This is also the
11 case if the business close down; then any wages not paid by the firm are covered by a
12 state wage guarantee. There are also a number of security agreements between
13 employer organisations and trade union organisations entitling redundant workers to
14 severance pay. The trade union organisations also provide both collective and
15 individual unemployment insurance compensating for forgone income above the
16 ceiling in the unemployment insurance scheme. A majority of all workers are
17 covered by these collective agreements and similar insurance schemes also exist in
18 the case of sickness and disability.
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34 None of the supplementary schemes will be explicitly included in the following
35 analysis due to the difficulty to identify such payments in the data. Unfortunately,
36 some of them will be implicitly included, since according to Statistics Sweden at
37 least some of the supplementary unemployment insurances will show up as earnings
38 in the administrative registers. Hence, estimates of the earnings losses from job loss
39 are likely to be underestimated and any estimates of the income replacement from
40 social security should be interpreted as the part replaced by the public social security
41 system alone.
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3 Data, method, and estimations

3.1 Data

The data used here is linked employee-employer data containing all couples where the husband was displaced in 1987, as well as a random sample of comparable couples where the husbands were not displaced in this year. To create the data set three registers (i.e., the Register Based Labour Market Statistics; the Longitudinal Database for Education, Income and Occupation; and the Income and Wealth Register) were merged to obtain information on these couples for four pre-displacement years (i.e., 1983-1986) and 13 post-displacement years (i.e., 1987-1999).⁶

The samples of married couples were constructed in four steps. First, all closing establishments with at least 10 employees were identified by the disappearance of their identity number from the administrative registers. The problem with ‘false firm deaths’ (i.e., that the disappearance of the identity number is instead due to, for example, a change of owner) emphasized in Kuhn (2002) was eliminated by Statistics Sweden by also surveying the firm.

In a second step, the workers corresponding to these establishments were identified by linking individual data to establishment data.⁷ A worker was defined as

⁶ Income taxation and the administration of the universal Swedish welfare state provide the source for many of the variables in these registers. The employer files all wage payments to the tax authorities and, as practically all transfers in the Swedish welfare state, such as disability insurance, and sickness and unemployment benefits, are liable to tax the National Social Insurance Board also files income statements on such transfers (together with non-taxable social assistance payments).

⁷ Registers can be merged and one can link employees to their establishments since every resident and every establishment in Sweden has a unique identity number (i.e., a civic registration number or an

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3 displaced if employed at a closing establishment in November 1986, but no longer in
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5 November 1987.⁸ This definition assumes that all separations were related to closure.
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8 However, separations may be voluntary quits unrelated to the closure; pre-emptive
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10 quits, i.e., quits due to the expectation of closure; and actual displacements, i.e.,
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12 where notice was served on the termination of the employment contact. Thus, using
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14 administrative data, any definition of displaced workers will probably also include
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16 certain voluntary quits unrelated to the closure.
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20 A comparison group was constructed in a third step as a random sample of
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22 married men who were employed in November of 1986 at non-closing
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24 establishments with at least 10 employees. However, some of these workers could
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26 have lost a job in 1987 for other reasons or have been displaced in any subsequent
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28 year.
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32 In a fourth step, all married male workers were linked to their spouse. This was
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34 possible since there is joint taxation of wealth for married couples in Sweden and
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36 Statistics Sweden collects the administrative records from the National Tax Board.
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38 The same information could therefore be attained for both spouses.
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45 organization number) and that the obligatory income statements filed to the taxation authorities by the
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47 employer, contain both these numbers.
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50 ⁸ This ensures that all displaced workers were employed at the same point in time as the workers in
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52 the comparison group and implies that for closures in 1987, only those who were displaced in the
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54 closing year were included in the sample and for closures in 1988, only those displaced during the
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56 calendar year before final closure given that the closing process was deemed longer than a year. The
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58 length of each individual closing process was determined *ad hoc* based on establishment size and
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60 worker flows during the three years preceding the closure. Most of the closing processes, however,
were considered less than a calendar year.

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3 Finally, I constrained the sample to couples where both spouses were of age 25-51 yrs
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5 in the end of 1986, had non-missing information for all baseline variables, and had
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7 been married during the four baseline years. The age restriction ensures that both
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9 spouses were of working age during the full follow-up period, while the latter
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11 restriction ensures that the baseline variables correspond to the two spouses as a
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13 married couple. After applying these restrictions 1,122 displaced and 29,934 non-
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15 displaced couples remained.
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21 22 **3.2 Method**

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24 The focus on displacements due to plant closures only, is likely to reduce any
25
26 selection problems. One can argue that an establishment closure is close to a natural
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28 experiment as all workers are separated from their jobs irrespective of their
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30 individual characteristics and behaviour. Nonetheless, there will be differences
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32 between displaced and non-displaced workers, since closures are not randomly
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34 distributed over the economy.⁹ In the displaced worker literature (e.g., Jacobson et al.
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36 1993; Margolis, 1999; Huttunen et al., 2006), a fixed-effect regression model
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38 including both lagged and leading dummy variables of the incidence of job
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40 displacement, have become standard when examining wage and earnings effects of
41
42 job displacement. This model exploits the panel dimension of the data in that it
43
44 control for unobserved time-invariant variables and allows the impact of job loss to
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46 set in even before the actual job loss and to be long lasting. Here, I will combine the
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⁹ See Falck (2007) for an empirical study of the impact of regional conditions on firm survival.

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3 fixed-effect estimator with propensity score and inverse-probability-of-censoring
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5 weighting.¹⁰
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8 By propensity score weighting, one will ideally obtain a pseudo-sample where the
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10 distribution of observed characteristics is the same in the sample of displaced and
11
12 non-displaced couples. The propensity score (p^D) is the probability of treatment
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14 (Rosenbaum & Rubin, 1983), i.e., displacement, which is usually not known but has
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16 to be estimated; here by a logit model: $p_i^D = Pr[D_{i,baseline} = 1 | X_{i,baseline}] =$
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18 $= \{1 + \exp(-\alpha_0 - \alpha_1 X_{i,baseline})\}^{-1}$, where $D_{i,baseline}$ is an indicator taking the value 1 if
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20 worker i was displaced at baseline and 0 otherwise, and $X_{baseline}$ is a vector of
21
22 baseline covariates. To estimate the effect on those actually displaced, couple i is
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24 then assigned a weight $\omega_i^D = D_i + (1 - D_i) \cdot p_i^D / (1 - p_i^D)$.¹¹ Hence, all displaced
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26 couples are assigned a weight equal to one, while each non-displaced couple j is
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28 assigned a weight equal to $p_j^D / (1 - p_j^D)$.
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36 As Charles and Stephens (2004) recognizes, a study which focuses on couples
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38 who remain married for the whole study period is likely to underestimate true family
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40 adjustment due to job loss, as couples who remain married are likely to be those who
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42 had to make the least adjustment to the job loss.¹² To adjust for this I will adopt an
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44 additional, but similar weighting strategy, i.e., inverse-probability-of-censoring-
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46 weighting, proposed by Robins and Rotnitzky (1995). While the job loss is viewed as
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52 ¹⁰ See Hirano and Imbens (2001) for their suggested propensity score weighted regression and Robins
53
54 and Rotnitzky (1995) for their inverse-probability-of-censoring weighted estimator.

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56 ¹¹ See Hirano and Imbens (2001).

57
58 ¹² Divorce is not the only reason for a couple to be censored; marriages also dissolve upon the death of
59
60 a spouse, and even though migration of one or both spouses does not necessarily mean that the
marriage is dissolved they are no longer observed in the data.

a point treatment (i.e., it is assumed to occur at the baseline and the baseline only), censoring may occur in any year during the post-displacement period. Thus, the conditional probability of being censored is estimated for each year by a pooled logit model: $p_{i,t}^C = Pr[C_{i,t} = 1 | C_{i,t-1} = 0, D_{i,baseline}, X_{i,baseline}, Z_{i,t-1}] =$

$$= \{1 + \exp(-\beta_0 - \beta_1 X_{i,baseline} - \beta_2 Z_{i,t-1} - \sum_{k=1}^{4+} \beta_3^k D_{i,baseline} I_t^k - \gamma_t)\}^{-1},$$

where C_t is a censoring indicator, $X_{baseline}$ is again a vector of baseline variables, Z_{t-1} a vector of lagged time-varying variables, and $D_{baseline} I_t^k$ indicates time relative to baseline displacement (i.e., it is equal one if baseline displacement occurred k years prior to year t). The inverse-probability-of-censoring weights can then be defined as

$$\omega_{i,t}^C = \prod_{k=0}^t \{1 - p_{i,k}^C\}^{-1}.^{13}$$

The derived propensity score and censoring weights can then be used to construct the final weights as $\omega_{i,t} = \omega_i^D \times \omega_{i,t}^C$, which will be applied to a weighted fixed-effect regression: $y_{i,t} = \tau W_{i,t} + \sum_{k=-3}^{4+} \delta^k D_{i,baseline} I_t^k + \gamma_t + \mu_i + \varepsilon_{i,t}$, where y_t is either earnings or transfers, W_t a vector of time-varying variables unaffected by the displacement, and γ_t and μ_i are time and couple specific effects, respectively. Finally, $D_{baseline} I_t^k$ indicates as before time relative to baseline displacement. It allows the estimated impact of displacement (δ^k) to set in three years prior to the actual displacement and vary by year up to three years after displacement and is then assumed to be constant.

¹³ Instead applying the ‘stabilized’ inverse-probability-of-censoring-weights, also proposed by Robins and Rotnitzky (1995), does not alter any results in the following analysis.

3.3 Choice of conditioning variables

The baseline variables included in the estimation of the probability of job loss and of the probability of being censored were the same. Included were both spouses' age (third order); indicators of being foreign born, attained education (8 categories), and industry sector (10 categories); indicators of non-zero income, and the amounts, from employment (incl. self-employment), unemployment insurance, sickness insurance, and disability insurance; number of children aged 0–6 yrs and 7–17 yrs; county of residence (21 counties); and the couples incidence and total amount of taxable wealth and means-tested social assistance. The estimation of the probability of being censored included time-varying measures of county of residence and all income measures except for taxable wealth, which were not available for all years, while the estimation of the outcome equation only included county of residence and the spouses ages (third order).

3.4 Descriptive statistics and balancing test

Before examining the results, we will assess the degree of covariate balance. To compare comparable people, has been shown to be important in reducing selection bias in evaluation studies (Heckman et al., 1999). To investigate whether comparable samples have been obtained with respect to the baseline covariates, the differences in terms of standardized differences in means (SDM) were calculated for each single baseline (Table A2).¹⁴ ¹⁵ The most pronounced pre-displacement differences between

¹⁴ Various other balancing tests have been suggested in the literature (Smith & Todd, 2005), but there is no consensus on which of them to apply.

¹⁵ The standardized difference in means is the difference in covariate means between the displaced couples and the weighted non-displaced couples, in percentage of the pooled standard deviation (before weighting) of that covariate.

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3 the two un-weighted samples correspond to differences in economic sector where the
4 husbands were employed. As can be expected, a much smaller share of the displaced
5 men were employed in community, social, and personal services, containing much of
6 the public sector, while they to a larger extent were employed in the construction
7 sector and financial intermediation, real estate, renting, or business activities. Other
8 pronounced differences are lower earnings, and more experiences of unemployment
9 among the displaced husbands.
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20 The average of the absolute values of the SDMs before the propensity score
21 weighting was 6.99, while after weighting it decreased considerably to 0.36. The
22 largest absolute value of SDM for a single covariate decreased from 38.75 to 1.80.
23
24 As an absolute value of 20 was considered substantial in Rosenbaum and Rubin
25 (1985), while less than 10 was considered small in Normand, Landrum, Guadagnoli,
26 Ayanian, Ryan, Cleary et al. (2001), this would suggest that the two samples were
27 not that disparate even before the propensity score weighting, but that weighting the
28 non-displaced couples, nonetheless, considerably reduced any imbalances.
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41 **4 Results**

42 **4.1 The impact of husbands' job loss on both spouses earnings**

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44 A natural point of departure would be to first make a convincing case that the job
45 losses produced a shock to earnings of married men. Table 1 (left column) presents
46 the estimates of husbands' job loss on own annual earnings in thousand Swedish
47 kronor (SEK). All amounts are deflated to the 1999 values using the consumer price
48 index.
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58 There was a decline in annual earnings, although statistically non-significant, in
59 the year immediately preceding the job loss similar to what have been found in
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3 previous studies (e.g., Jacobson et al., 1993). As expected there was then a large drop
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5 in the displacement year corresponding to 9,325 SEK (4.1 %) and it dropped even
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7 further to more than 13,000 SEK (5.6 %) in the following year.¹⁶ Although the
8
9 negative impact seems to have diminished somewhat in the next year, this recovery
10
11 was only temporary. During the last nine years, the annual losses were more than
12
13 14,000 SEK (6.2 %). The larger long-run effects might be explained by the severe
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15 recession, in the early 1990s, during which it has been argued that displaced workers
16
17 were more likely to once again lose their jobs (Eliason and Storrie, 2006).¹⁷
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22 After having established that job loss inflicted rather large and persistent losses in
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24 married men's earnings we proceed to the main part of the paper investigating
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26 whether these losses were replaced by other means. One possibility would be that the
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28 wife either entered the labour market or if already working increased hours of work
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30 (i.e., an added worker effect) to compensate the reduction in family income arising
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32 from the husband's job loss. Although wives' hours of work are not observed in the
33
34 data their annual earnings are. Changes in annual earnings may only approximately
35
36 correspond to changes in labour supply, but analyzing earnings data can answer the
37
38 perhaps more important question whether the wives were able to replace the losses
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40 inflicted on their husbands' earnings.
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45
46 >>TABLE 1 ABOUT HERE<<
47

48 The earnings estimates for the wives are for most years statistically non-significant
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50 and in the initial years around the husband's job loss the estimates are also very close
51
52 to zero. From the second post-displacement year and onwards the earnings of wives
53
54

55 ¹⁶ The presented relative effects are calculated by dividing the estimate by the difference between the
56
57 weighted mean for the displaced workers and the same estimate.
58

59 ¹⁷ Stevens (1997) also showed that the main cause of the long-term effects of job loss on earnings was
60
attributable to higher risks of subsequent job losses.

1
2
3 to displaced men was actually negatively affected, opposite to what one would have
4 expected *a priori*, although statistically significant only in the third post-
5 displacement year. Thus, it can be concluded that wives did not replace any of the
6 earnings losses of their husbands. The dip in the second post-displacement year
7 coincided with the temporary recovery of husbands' earnings, which possibly could
8 signify an adjustment by the couple to improve the husband's employment, or
9 earnings, opportunities at the expense of the wife's earnings. One potential such
10 adjustment would be that they moved to maximize the husband's earnings potential
11 and the wife, as the secondary earner, would then be considered a tied mover.
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27 **4.2 Displaced couples' utilization of the social security system**

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29 As the earnings losses that married men suffered from job loss, do not seem to have
30 been replaced by increased labour supply of the wife one can then ask whether the
31 couples instead were able to offset these losses by making use of the public social
32 security system. In the following, I will present the results from investigating the
33 impact of husband's job loss on the couples' utilization of four kinds of social
34 security: unemployment insurance, sickness insurance, disability insurance, and
35 means-tested social benefits. Although the Swedish public social security system
36 encompasses also other benefits, those have to be regarded less important for couples
37 in working age. However, the supplementary insurance schemes briefly mentioned
38 above have recently been pointed to as important elements in the Swedish welfare
39 state (Sjögren Lindquist & Wadensjö, 2006).
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55 Starting with the utilization of unemployment insurance (Table 2), there was a
56 large increase in the received amount of unemployment insurance by the husband in
57 the year of the job loss. In monetary terms, it corresponds to about 6,400 SEK (428.8
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3 %) offsetting almost 70 percent of the earnings loss. During the next three years,
4
5 however, there was a sharp decrease in the utilization of unemployment insurance,
6
7 which ceased abruptly in the following year and then even reversed. The longer run
8
9 impact corresponds to roughly a 4,700 SEK (60.5 %) increase in annually received
10
11 unemployment insurance. Although it is possible that husbands' unemployment
12
13 insurance crowded-out any immediate added-worker effect, this is an unlikely
14
15 explanation of the lack of adjustment of wives' labour supply in the longer run.
16
17 Moreover, neither the lack of response in wives' labour supply (i.e., annual earnings)
18
19 during the first years nor the following decrease in earnings can be explained by
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21 higher utilization of unemployment insurance amongst the wives.
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27 >>TABLE 2 ABOUT HERE<<
28

29 A significant number of studies have found an association between job loss and ill
30
31 health. Not only may the loss of a job be stressful because of long-lasting earnings
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33 losses but it may also entail the loss of social networks and time structure, threatened
34
35 self-esteem and self-confidence, and possibly altered family relations and increased
36
37 family tensions. Some of the distress associated to job loss has been shown to extend
38
39 also to other family members.¹⁸ Thus, it seems natural to investigate whether
40
41 increased sickness or disability can be a partial explanation of either married men's
42
43 long-lasting earnings losses or wives' lack of adjustment. As can be seen in the left
44
45 columns of Table 3 and 4, there was no immediate impact of job loss on husbands'
46
47 own utilization of either sickness or disability insurance. This is the expected result
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49 when it comes to disability pension, but if one believes that job loss has adverse
50
51 health effects, one should perhaps have expected increased sickness. This does not
52
53 necessarily mean that job loss did not adversely affect health, as those unemployed
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¹⁸ For a review, see Jones (1992) or Ström (2003).

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3 may just not have bothered to report sick. However, there is, at least an indication, of
4
5 a long-run effect on the utilization of disability insurance corresponding to an annual
6
7 increase of 1,281 SEK (18.8 %). Although the possibility to be granted disability
8
9 insurance partly for labour market reasons was exhausted in 1997, this would still
10
11 have been a possibility for some of the workers here. Thus, any increased utilization
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13 of disability pension cannot be viewed in terms of deterioration in health only but
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15 also in terms of sustained labour market difficulties.¹⁹ The impact on wives'
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17 utilization of sickness and disability insurance was only minor and in no case
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19 statistically significant.
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23

24 >>TABLE 3 ABOUT HERE<<

25 >>TABLE 4 ABOUT HERE<<

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28
29 The final type of social security investigated here is also the ultimate safety net for
30
31 the unemployed. Although the overall utilization of means-tested social assistance
32
33 increased dramatically in Sweden during the 1990s, one would not expect this source
34
35 of income to be dominating in a sample of workers who all have previously been
36
37 employed and so insured. It is, nonetheless, interesting to examine to what extent job
38
39 loss increased the utilization of means-tested social assistance, since receiving it can
40
41 be viewed as an indicator of officially recognized economic hardship (Stenberg,
42
43 1998).²⁰
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48 However, the estimates reveal only a minor, and statistically non-significant,
49
50 impact of husband's job loss on the couple's utilization of means-tested social
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53 ¹⁹ For the Netherlands it has been found that approximately one quarter of the disability insurance
54
55 enrolment was hidden unemployment (Koning & van Vuuren, 2007).
56

57 ²⁰ Since the shame or social stigma associated to receiving means-tested social assistance implies that
58
59 not all of those who are poor enough to be eligible actually apply, any measure based on receiving
60
social assistance is likely to underestimate the true degree of economic hardship (Stenberg, 1998).

1
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3 assistance (Table 5). Thus, albeit the previous results have indicated that displaced
4
5 married men suffered long-lasting earnings losses it seems that job displacements in
6
7 Sweden, and at this time, did not lead to widespread severe economic hardship for
8
9 the displaced workers or their families.
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12 >>TABLE 5 ABOUT HERE<<
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15 Finally, I will summarize by showing, also in Table 5 (right), the impact of job loss
16
17 on annual pre-tax family income.²¹ Although the immediate loss of husbands' own
18
19 earnings transmits to a large loss in family income, job loss seem to have long-lasting
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21 economic impact even when including wife's income and income from
22
23 unemployment, sickness, and disability insurance, and means-tested social benefits.
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25 From the second post-displacement year and to the end of the observation period,
26
27 eleven years later, the loss in family income before taxes were more than 9,600 SEK
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29 (2.5 %) each year.
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36 **4.3 Robustness checks and the impact of censoring**

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38 As a check of robustness of the results to the choice of estimator, the fixed-effect
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40 regressions were re-estimated without applying the propensity score and inverse-
41
42 probability-of-censoring weights. I argued in Section 3, that not taking censoring into
43
44 account may produce biased estimates, as censoring occurs by the dissolution of the
45
46 couple (either by divorce, death, or migration) and one would expect these couples to
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50
51 ²¹ The measure of family income is not equivalent to total disposable family income but is the before
52
53 tax sum of both spouses' earnings and the transfers investigated here. As stated above the exclusion of
54
55 any supplementary benefits are likely to overestimate any adverse impact although diminished by the
56
57 fact that some of these benefits show up as earnings in the data. The use of family income *before*
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59 taxes, on the other hand, will probably overestimate the same effects to some extent as the progressive
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income tax is likely to offset some of the differences.

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3 be the ones to have required the most adjustments to the job loss. However, the
4
5 estimates obtained then not applying the inverse-probability-of-censoring weights
6
7 (Table A2) are very close to those presented earlier. Table A3 shows the
8
9 corresponding estimates when the fixed effect estimator is applied without both
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11 inverse-probability-of-censoring weights and propensity score weights. These
12
13 estimates differ somewhat more and then especially the long-run estimates. In
14
15 comparison, the estimates presented in the main analysis are in most cases the more
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17 conservative, while the unweighted estimates suggest that there are statistically
18
19 significant long-run effects of job loss on both husbands' and wives' earnings, family
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21 income, as well as husbands' utilization of all three insurances.
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29 **5 Summary and discussion**

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32 This paper has explored to which extent married men's earnings losses, following
33
34 involuntary job loss, were replaced by either increased earnings by the wife or by
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36 transfers from the public social security system. The empirical evidence on these
37
38 matters is sparse, although a vast literature establishes long-lasting earnings losses
39
40 following job loss.
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42

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44 Job displacement among the married men in this study seems to have inflicted
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46 substantial long-run earnings losses. This would suggest incentives for increased
47
48 labour supply by the wife to offset these losses. However, no such adjustment is
49
50 evident. If anything, the wives of the displaced men experience on average lower
51
52 earnings. A number of explanations have been suggested, in the literature to why an
53
54 added worker effect have not been established empirically, such as disincentives
55
56 from means-tested social insurances, both spouses are more likely to lose their job
57
58 due to assortative mating, shared restrictions stemming from common labour market
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3 circumstances, and that spouses have preferences in favour of joint leisure (Doris,
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5 1999; Prieto-Rodríguez & Rodríguez-Gutiérrez, 2000). Most of these explanations,
6
7 however, can be ruled out here. Unemployment insurance is not given on family
8
9 basis in Sweden and neither did government transfers replace a major part of
10
11 husbands' long-run earnings losses. The exclusive focus on job displacements due to
12
13 establishment closure should reasonably exclude also assortative mating as a
14
15 plausible explanation. A potential explanation, not explicitly mentioned in the
16
17 literature on the added worker effect, is that job loss may affect wives' health, and
18
19 especially mental health, which could adversely affect her productivity and work
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21 absenteeism. Although the possibility that such a mechanism was at work cannot be
22
23 rejected, it is not supported by an increase in wives' sickness insurance.
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29 To conclude, neither do wives' labour supply work as insurance for long-lasting
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31 earnings losses following married men's job displacement nor does the social
32
33 security system offset the major part of these losses; the long-run losses in family
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35 income amount to almost 10,000 SEK. As the impact on individual earnings (the
36
37 measure most frequently used in previous studies) does not necessarily reflect the
38
39 real economic impact on the individual, this adds to the current knowledge on the
40
41 individual and family welfare costs of worker displacement. Moreover, married
42
43 men's job loss did not only increase their utilization of unemployment insurance but
44
45 there is also an indication of an increased utilization of disability insurance in the
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47 long run. Although many studies have shown adverse health effects from involuntary
48
49 job loss, the increased utilization of disability insurance does not necessarily confirm
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51 such negative health effects as disability insurance was granted also for labour
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53 market reasons.
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3 No increase in utilization of social assistance was found, however, which would
4 suggest that job loss in Sweden during these years did not cause widespread severe
5 economic hardship at least. However, as displaced workers lose their jobs not by
6 fault, or behaviour, but due to economic, and structural, change beneficial to the
7 economy overall, the failure of both the family and the welfare state to replace their
8 lost earning suggests that displaced workers and their families bear the costs of
9 increased welfare for all.
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For Peer Review

Tables

Table 1. Estimates of the impact of married men's job loss on their own, and their wives', annual earnings in thousand Swedish kronor (SEK). 1,000 SEK \approx €107.

| Years before/after displacement | Husband's Earnings | | Wife's Earnings | |
|---------------------------------|--------------------|---------|-----------------|---------|
| | Coef. | (S.E.) | Coef. | (S.E.) |
| Three years before | 0.056 | (1.877) | 0.083 | (1.083) |
| Two years before | 0.155 | (2.040) | -0.071 | (1.407) |
| One year before | -2.142 | (2.283) | 0.409 | (1.574) |
| Year of displacement | -9.247 | (2.879) | -0.373 | (1.836) |
| One year after | -13.212 | (3.201) | -1.070 | (1.958) |
| Two years after | -10.783 | (3.291) | -3.546 | (2.130) |
| Three years after | -12.395 | (3.445) | -4.457 | (2.187) |
| 4-12 years after | -14.200 | (4.299) | -2.979 | (2.340) |

Table 2. Estimates of the impact of married men's job loss on own and wives' amount of annually received unemployment insurance (UI) in thousand Swedish kronor (SEK). 1,000 SEK \approx €107.

| Years before/after displacement | Husband's UI | | Wife's UI | |
|---------------------------------|--------------|---------|-----------|---------|
| | Coef. | (S.E.) | Coef. | (S.E.) |
| Three years before | -0.054 | (0.422) | -0.018 | (0.319) |
| Two years before | -0.038 | (0.508) | 0.028 | (0.378) |
| One year before | 1.177 | (0.522) | 0.468 | (0.445) |
| Year of displacement | 6.406 | (0.783) | 1.091 | (0.555) |
| One year after | 3.939 | (0.729) | 0.237 | (0.488) |
| Two years after | 1.578 | (0.586) | -0.133 | (0.493) |
| Three years after | 1.385 | (0.560) | -0.043 | (0.403) |
| 4-12 years after | 4.611 | (0.884) | 0.767 | (0.631) |

Table 3. Estimates of the impact of married men's job loss on own and the wife's amount of annually received sickness insurance (SI) in thousand Swedish kronor (SEK). 1,000 SEK \approx €107.

| Years before/after displacement | Husband's SI | | Wife's SI | |
|---------------------------------|--------------|---------|-----------|---------|
| | Coef. | (S.E.) | Coef. | (S.E.) |
| Three years before | -0.023 | (0.365) | 0.011 | (0.340) |
| Two years before | -0.027 | (0.532) | -0.001 | (0.409) |
| One year before | 0.918 | (0.678) | 0.255 | (0.503) |
| Year of displacement | -0.245 | (0.798) | 0.616 | (0.694) |
| One year after | -0.424 | (0.878) | 0.553 | (0.777) |
| Two years after | -0.029 | (0.914) | 1.016 | (0.859) |
| Three years after | 1.213 | (1.057) | 0.352 | (0.861) |
| 4-12 years after | 0.714 | (0.571) | -0.290 | (0.457) |

Table 4. Estimates of the impact of married men's job loss on own and the wife's amount of annually received disability insurance (DI) in thousand Swedish kronor (SEK). 1,000 SEK \approx €107.

| Years before/after displacement | Husband's DI | | Wife's DI | |
|---------------------------------|--------------|---------|-----------|---------|
| | Coef. | (S.E.) | Coef. | (S.E.) |
| Three years before | 0.013 | (0.021) | 0.006 | (0.120) |
| Two years before | -0.004 | (0.029) | 0.009 | (0.173) |
| One year before | 0.039 | (0.111) | -0.137 | (0.220) |
| Year of displacement | -0.012 | (0.204) | -0.162 | (0.275) |
| One year after | 0.025 | (0.339) | -0.211 | (0.321) |
| Two years after | -0.045 | (0.441) | 0.075 | (0.448) |
| Three years after | -0.287 | (0.706) | 0.068 | (0.642) |
| 4-12 years after | 1.434 | (0.870) | 0.179 | (0.669) |

Table 5. Estimates of the impact of married men's job loss on amount of annually received means-tested social benefits and annual family income in thousand Swedish kronor (SEK). 1,000 SEK \approx €107.

| Years before/after displacement | Couple's SA | | Couple's Total Income | |
|---------------------------------|-------------|---------|-----------------------|---------|
| | Coef. | (S.E.) | Coef. | (S.E.) |
| Three years before | 0.022 | (0.172) | 0.096 | (2.184) |
| Two years before | 0.040 | (0.235) | 0.090 | (2.495) |
| One year before | 0.273 | (0.265) | 1.261 | (2.721) |
| Year of displacement | 0.212 | (0.220) | -1.713 | (3.132) |
| One year after | 0.407 | (0.223) | -9.754 | (3.562) |
| Two years after | 0.259 | (0.224) | -11.607 | (3.779) |
| Three years after | 0.143 | (0.292) | -14.022 | (3.832) |
| 4-12 years after | 0.139 | (0.286) | -9.625 | (4.498) |

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Appendix

Table A1. Descriptive statistics, for displaced ($D=1$) and non-displaced couples ($D=0$), and balancing test of baseline covariates before and after propensity score weighting.

| Baseline variables | Unweighted sample (means) | | | Weighted sample (means) | | |
|--|------------------------------|--------|-------------|----------------------------|--------|-------------|
| | $D=1$ | $D=0$ | <i>ASDM</i> | $D=1$ | $D=0$ | <i>ASDM</i> |
| <i>Demographic variables in 1986</i> | | | | | | |
| Husband's Age (yrs) | 40.696 | 40.929 | 3.84 | 40.696 | 40.687 | 0.14 |
| Wife's age (yrs) | 38.335 | 38.790 | 7.51 | 38.335 | 38.321 | 0.23 |
| Husband foreign born (0/1) | 0.151 | 0.099 | 15.60 | 0.151 | 0.152 | 0.40 |
| Wife foreign born (0/1) | 0.155 | 0.108 | 14.00 | 0.155 | 0.157 | 0.49 |
| Children aged 0-6 yrs (no.) | 0.504 | 0.492 | 1.58 | 0.504 | 0.507 | 0.45 |
| Children aged 7-17 yrs (no.) | 0.841 | 0.831 | 1.41 | 0.841 | 0.842 | 0.19 |
| <i>Husband's education in 1986 (0/1)</i> | | | | | | |
| Unknown education | 0.051 | 0.034 | 8.56 | 0.051 | 0.051 | 0.18 |
| Compulsory school, < 9 yrs | 0.242 | 0.205 | 8.88 | 0.242 | 0.243 | 0.14 |
| Compulsory school, 9 yrs | 0.102 | 0.094 | 2.44 | 0.102 | 0.102 | 0.17 |
| Upper secondary school, < 3 yrs | 0.269 | 0.232 | 8.67 | 0.269 | 0.270 | 0.07 |
| Upper secondary school, 3-4 yrs | 0.140 | 0.165 | 7.03 | 0.140 | 0.140 | 0.06 |
| Tertiary education < 3 yrs | 0.104 | 0.102 | 0.85 | 0.104 | 0.104 | 0.05 |
| Tertiary education 3+ yrs | 0.085 | 0.150 | 20.40 | 0.085 | 0.085 | 0.01 |
| PhD studies | 0.005 | 0.017 | 11.41 | 0.005 | 0.005 | 0.01 |
| <i>Wife's education in 1986 (0/1)</i> | | | | | | |
| Unknown education | 0.061 | 0.037 | 10.79 | 0.061 | 0.062 | 0.50 |
| Compulsory school, < 9 yrs | 0.184 | 0.161 | 5.90 | 0.184 | 0.183 | 0.11 |
| Compulsory school, 9 yrs | 0.137 | 0.137 | 0.08 | 0.137 | 0.136 | 0.26 |
| Upper secondary school, < 3 yrs | 0.347 | 0.338 | 1.75 | 0.347 | 0.346 | 0.24 |
| Upper secondary school, 3-4 yrs | 0.079 | 0.070 | 3.42 | 0.079 | 0.079 | 0.06 |
| Tertiary education < 3 yrs | 0.104 | 0.125 | 6.55 | 0.104 | 0.105 | 0.07 |
| Tertiary education 3+ yrs | 0.085 | 0.125 | 13.21 | 0.085 | 0.085 | 0.11 |
| PhD studies | 0.004 | 0.005 | 1.59 | 0.004 | 0.004 | 0.41 |
| <i>Husband's industry sector in 1986 (0/1)</i> | | | | | | |
| Unidentified or non-employed | 0.002 | 0.002 | 1.09 | 0.002 | 0.002 | 0.35 |
| Agriculture, fishing, and forestry | 0.041 | 0.012 | 18.50 | 0.041 | 0.040 | 0.87 |
| Mining and quarrying | 0.000 | 0.007 | 11.80 | 0.000 | 0.000 | 0.00 |
| Manufacturing | 0.377 | 0.364 | 2.77 | 0.377 | 0.377 | 0.10 |
| Electricity, gas, and water supply | 0.017 | 0.020 | 1.95 | 0.017 | 0.017 | 0.01 |
| Construction | 0.128 | 0.080 | 15.93 | 0.128 | 0.129 | 0.16 |
| Trade, restaurants and hotels | 0.133 | 0.105 | 8.61 | 0.133 | 0.134 | 0.22 |
| Transport, storage, communication | 0.085 | 0.091 | 2.06 | 0.085 | 0.085 | 0.03 |
| Financing, insurance, real estate, etc | 0.122 | 0.084 | 12.62 | 0.122 | 0.123 | 0.40 |
| Community, social, personal services | 0.095 | 0.237 | 38.75 | 0.095 | 0.095 | 0.09 |
| <i>Wife's industry sector in 1986 (0/1)</i> | | | | | | |
| Unidentified or non-employed | 0.137 | 0.114 | 6.98 | 0.137 | 0.137 | 0.04 |
| Agriculture, fishing, and forestry | 0.009 | 0.006 | 3.45 | 0.009 | 0.009 | 0.09 |
| Mining and quarrying | 0.003 | 0.001 | 2.99 | 0.003 | 0.003 | 0.40 |
| Manufacturing | 0.112 | 0.108 | 1.51 | 0.112 | 0.112 | 0.12 |
| Electricity, gas, and water supply | 0.000 | 0.003 | 8.19 | 0.000 | 0.000 | 0.00 |
| Construction | 0.016 | 0.010 | 5.84 | 0.016 | 0.017 | 0.39 |
| Trade, restaurants and hotels | 0.106 | 0.102 | 1.26 | 0.106 | 0.106 | 0.14 |
| Transport, storage, communication | 0.040 | 0.036 | 2.01 | 0.040 | 0.040 | 0.07 |
| Financing, insurance, real estate, etc | 0.069 | 0.068 | 0.23 | 0.069 | 0.069 | 0.06 |
| Community, social, personal services | 0.508 | 0.552 | 8.75 | 0.508 | 0.509 | 0.14 |

Table A1. Cont'd.

| Baseline variables | Unweighted sample (means) | | | Weighted sample (means) | | |
|---|------------------------------|---------|-------|----------------------------|---------|------|
| | D=1 | D=0 | ASDM | D=1 | D=0 | ASDM |
| <i>Region of residence in 1986 (0/1)</i> | | | | | | |
| Stockholm county | 0.173 | 0.172 | 0.26 | 0.173 | 0.175 | 0.55 |
| Uppsala county | 0.030 | 0.034 | 1.93 | 0.030 | 0.030 | 0.07 |
| Södermanland county | 0.025 | 0.030 | 2.85 | 0.025 | 0.025 | 0.03 |
| Östergötland county | 0.038 | 0.050 | 5.69 | 0.038 | 0.039 | 0.11 |
| Jönköping county | 0.017 | 0.041 | 14.56 | 0.017 | 0.017 | 0.01 |
| Kronoberg county | 0.020 | 0.024 | 3.09 | 0.020 | 0.019 | 0.42 |
| Kalmar county | 0.019 | 0.029 | 6.86 | 0.019 | 0.019 | 0.24 |
| Gotland county | 0.001 | 0.005 | 8.03 | 0.001 | 0.001 | 0.00 |
| Blekinge county | 0.031 | 0.021 | 6.59 | 0.031 | 0.031 | 0.09 |
| Skåne county | 0.090 | 0.130 | 12.70 | 0.090 | 0.090 | 0.11 |
| Halland county | 0.053 | 0.031 | 10.93 | 0.053 | 0.053 | 0.22 |
| Västra Götaland county | 0.207 | 0.172 | 8.92 | 0.207 | 0.207 | 0.17 |
| Värmland county | 0.025 | 0.031 | 3.84 | 0.025 | 0.024 | 0.35 |
| Örebro county | 0.051 | 0.032 | 9.41 | 0.051 | 0.051 | 0.02 |
| Västmanland county | 0.052 | 0.034 | 8.79 | 0.052 | 0.052 | 0.10 |
| Dalarna county | 0.053 | 0.031 | 10.85 | 0.053 | 0.049 | 1.79 |
| Gävleborg county | 0.037 | 0.033 | 1.99 | 0.037 | 0.037 | 0.15 |
| Västernorrland county | 0.006 | 0.031 | 18.26 | 0.006 | 0.006 | 0.02 |
| Jämtland county | 0.004 | 0.010 | 7.46 | 0.004 | 0.004 | 0.04 |
| Västerbotten county | 0.021 | 0.028 | 4.22 | 0.021 | 0.021 | 0.18 |
| Norrbottn county | 0.049 | 0.032 | 8.41 | 0.049 | 0.050 | 0.26 |
| <i>Husband's labour market position in 1983</i> | | | | | | |
| Any earnings (0/1) | 0.977 | 0.991 | 11.72 | 0.977 | 0.975 | 1.59 |
| Earnings (tSEK) | 198.587 | 210.415 | 11.80 | 198.587 | 198.357 | 0.23 |
| Any unemployment insurance (0/1) | 0.111 | 0.053 | 21.31 | 0.111 | 0.114 | 0.92 |
| Unemployment insurance (tSEK) | 3.079 | 1.444 | 14.42 | 3.079 | 3.173 | 0.83 |
| Any sickness insurance (0/1) | 0.611 | 0.621 | 2.15 | 0.611 | 0.607 | 0.64 |
| Sickness insurance (tSEK) | 4.438 | 4.395 | 0.38 | 4.438 | 4.404 | 0.31 |
| Any disability insurance (0/1) | 0.001 | 0.002 | 1.77 | 0.001 | 0.001 | 0.05 |
| Disability insurance (tSEK) | 0.043 | 0.093 | 2.40 | 0.043 | 0.043 | 0.01 |
| <i>Wife's labour market position in 1983</i> | | | | | | |
| Any earnings (0/1) | 0.883 | 0.902 | 6.09 | 0.883 | 0.882 | 0.36 |
| Earnings (tSEK) | 91.138 | 96.429 | 8.23 | 91.138 | 91.041 | 0.15 |
| Any unemployment insurance (0/1) | 0.096 | 0.069 | 9.81 | 0.096 | 0.097 | 0.16 |
| Unemployment insurance (tSEK) | 2.423 | 1.849 | 5.70 | 2.423 | 2.438 | 0.16 |
| Any sickness insurance (0/1) | 0.010 | 0.009 | 0.64 | 0.010 | 0.010 | 0.04 |
| Sickness insurance (tSEK) | 0.706 | 0.662 | 0.58 | 0.706 | 0.709 | 0.04 |
| Any disability insurance (0/1) | 0.642 | 0.616 | 5.24 | 0.642 | 0.640 | 0.29 |
| Disability insurance (tSEK) | 4.304 | 4.052 | 2.20 | 4.304 | 4.267 | 0.32 |
| <i>Husband's labour market position in 1984</i> | | | | | | |
| Any earnings (0/1) | 0.979 | 0.994 | 13.59 | 0.979 | 0.976 | 1.99 |
| Earnings (tSEK) | 202.674 | 216.088 | 13.34 | 202.674 | 202.401 | 0.27 |
| Any unemployment insurance (0/1) | 0.087 | 0.040 | 19.32 | 0.087 | 0.088 | 0.72 |
| Unemployment insurance (tSEK) | 2.949 | 1.161 | 16.02 | 2.949 | 3.085 | 1.23 |
| Any sickness insurance (0/1) | 0.600 | 0.604 | 0.91 | 0.600 | 0.598 | 0.34 |
| Sickness insurance (tSEK) | 4.993 | 4.579 | 3.24 | 4.993 | 4.991 | 0.01 |
| Any disability insurance (0/1) | 0.001 | 0.002 | 3.14 | 0.001 | 0.001 | 0.03 |
| Disability insurance (tSEK) | 0.042 | 0.121 | 3.38 | 0.042 | 0.042 | 0.01 |

Table A1. Cont'd.

| Baseline variables | Unweighted sample (means) | | | Weighted sample (means) | | |
|---|------------------------------|---------|-------|----------------------------|---------|------|
| | D=1 | D=0 | ASDM | D=1 | D=0 | ASDM |
| <i>Wife's labour market position in 1984</i> | | | | | | |
| Any earnings (0/1) | 0.911 | 0.915 | 1.54 | 0.911 | 0.909 | 0.54 |
| Earnings (tSEK) | 96.286 | 100.808 | 7.06 | 96.286 | 96.216 | 0.11 |
| Any unemployment insurance (0/1) | 0.090 | 0.068 | 8.11 | 0.090 | 0.089 | 0.22 |
| Unemployment insurance (tSEK) | 2.556 | 1.839 | 6.92 | 2.556 | 2.555 | 0.01 |
| Any sickness insurance (0/1) | 0.012 | 0.011 | 0.66 | 0.012 | 0.012 | 0.00 |
| Sickness insurance (tSEK) | 0.785 | 0.753 | 0.41 | 0.785 | 0.789 | 0.04 |
| Any disability insurance (0/1) | 0.618 | 0.614 | 0.86 | 0.618 | 0.618 | 0.04 |
| Disability insurance (tSEK) | 4.741 | 4.354 | 3.17 | 4.741 | 4.703 | 0.31 |
| <i>Husband's labour market position in 1985</i> | | | | | | |
| Any earnings (0/1) | 0.992 | 0.997 | 6.28 | 0.992 | 0.991 | 1.84 |
| Earnings (tSEK) | 208.909 | 220.810 | 11.56 | 208.909 | 208.712 | 0.19 |
| Any unemployment insurance (0/1) | 0.081 | 0.029 | 23.28 | 0.081 | 0.083 | 1.00 |
| Unemployment insurance (tSEK) | 2.829 | 0.809 | 19.35 | 2.829 | 2.978 | 1.42 |
| Any sickness insurance (0/1) | 0.613 | 0.642 | 6.01 | 0.613 | 0.614 | 0.08 |
| Sickness insurance (tSEK) | 6.114 | 5.305 | 5.26 | 6.114 | 6.106 | 0.05 |
| Any disability insurance (0/1) | 0.001 | 0.003 | 3.98 | 0.001 | 0.001 | 0.00 |
| Disability insurance (tSEK) | 0.042 | 0.153 | 4.32 | 0.042 | 0.041 | 0.02 |
| <i>Wife's labour market position in 1985</i> | | | | | | |
| Any earnings (0/1) | 0.921 | 0.926 | 2.05 | 0.921 | 0.920 | 0.44 |
| Earnings (tSEK) | 98.696 | 103.574 | 7.70 | 98.696 | 98.794 | 0.15 |
| Any unemployment insurance (0/1) | 0.088 | 0.066 | 8.20 | 0.088 | 0.088 | 0.15 |
| Unemployment insurance (tSEK) | 2.368 | 1.773 | 5.83 | 2.368 | 2.317 | 0.50 |
| Any sickness insurance (0/1) | 0.012 | 0.013 | 1.63 | 0.012 | 0.012 | 0.06 |
| Sickness insurance (tSEK) | 0.860 | 0.927 | 0.78 | 0.860 | 0.857 | 0.03 |
| Any disability insurance (0/1) | 0.654 | 0.651 | 0.63 | 0.654 | 0.653 | 0.18 |
| Disability insurance (tSEK) | 4.957 | 4.813 | 1.06 | 4.957 | 4.926 | 0.23 |
| <i>Couple's assets in 1983</i> | | | | | | |
| Any social assistance (0/1) | 0.032 | 0.022 | 6.12 | 0.032 | 0.034 | 1.25 |
| Social assistance (tSEK) | 0.833 | 0.345 | 8.07 | 0.833 | 0.991 | 2.60 |
| Any taxable wealth (0/1) | 0.068 | 0.084 | 6.17 | 0.068 | 0.068 | 0.05 |
| Taxable wealth (tSEK) | 64.994 | 88.575 | 5.84 | 64.994 | 64.986 | 0.00 |
| <i>Couple's assets in 1984</i> | | | | | | |
| Any social assistance (0/1) | 0.043 | 0.025 | 10.05 | 0.043 | 0.045 | 1.28 |
| Social assistance (tSEK) | 1.053 | 0.385 | 9.89 | 1.053 | 1.195 | 2.10 |
| Any taxable wealth (0/1) | 0.038 | 0.048 | 4.65 | 0.038 | 0.038 | 0.04 |
| Taxable wealth (tSEK) | 47.607 | 59.458 | 3.07 | 47.607 | 48.291 | 0.18 |
| <i>Couple's assets in 1985</i> | | | | | | |
| Any social assistance (0/1) | 0.042 | 0.023 | 10.71 | 0.042 | 0.044 | 1.22 |
| Social assistance (tSEK) | 0.957 | 0.393 | 8.39 | 0.957 | 1.078 | 1.80 |
| Any taxable wealth (0/1) | 0.049 | 0.060 | 4.70 | 0.049 | 0.049 | 0.23 |
| Taxable wealth (tSEK) | 80.625 | 70.968 | 1.30 | 80.625 | 63.572 | 2.30 |

Table A2. Propensity score weighted fixed effect estimates of husbands' job displacement.

| Years before/after displacement | Husband's | | | | Wife's | | | | Couple's | |
|---------------------------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| | Earnings | UI | SI | DI | Earnings | UI | SI | DI | SA | Total Income |
| | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) |
| Three years before | 0.02 (1.87) | -0.05 (0.42) | -0.02 (0.36) | 0.01 (0.02) | 0.08 (1.08) | -0.02 (0.32) | 0.01 (0.34) | 0.01 (0.12) | 0.02 (0.17) | 0.05 (2.18) |
| Two years before | 0.11 (2.04) | -0.04 (0.51) | -0.02 (0.53) | 0.00 (0.03) | -0.08 (1.41) | 0.02 (0.38) | 0.00 (0.41) | 0.01 (0.17) | 0.04 (0.23) | 0.04 (2.49) |
| One year before | -2.19 (2.28) | 1.17 (0.52) | 0.92 (0.68) | 0.04 (0.11) | 0.39 (1.57) | 0.47 (0.44) | 0.25 (0.50) | -0.13 (0.22) | 0.27 (0.26) | 1.20 (2.72) |
| Year of displacement | -9.30 (2.87) | 6.37 (0.78) | -0.26 (0.78) | 0.02 (0.20) | -0.42 (1.83) | 1.08 (0.55) | 0.62 (0.69) | -0.16 (0.27) | 0.21 (0.22) | -1.84 (3.12) |
| One year after | -13.30 (3.19) | 3.95 (0.72) | -0.47 (0.84) | 0.07 (0.33) | -1.07 (1.95) | 0.23 (0.48) | 0.51 (0.75) | -0.20 (0.32) | 0.38 (0.22) | -9.88 (3.55) |
| Two years after | -10.89 (3.27) | 1.57 (0.58) | 0.03 (0.88) | 0.00 (0.41) | -3.54 (2.12) | -0.12 (0.48) | 1.03 (0.83) | 0.05 (0.43) | 0.23 (0.21) | -11.64 (3.77) |
| Three years after | -12.36 (3.42) | 1.32 (0.55) | 1.12 (1.01) | -0.20 (0.65) | -4.51 (2.17) | -0.01 (0.40) | 0.39 (0.83) | 0.15 (0.60) | 0.14 (0.28) | -13.96 (3.82) |
| 4-12 years after | -14.05 (4.17) | 4.67 (0.86) | 0.72 (0.54) | 1.16 (0.80) | -2.67 (2.29) | 0.75 (0.61) | -0.19 (0.44) | 0.13 (0.64) | 0.16 (0.27) | -9.32 (4.37) |

Table A3. Unweighted fixed effect estimates of husbands' job displacement.

| Years before/after displacement | Husband's | | | | Wife's | | | | Couple's | |
|---------------------------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| | Earnings | UI | SI | DI | Earnings | UI | SI | DI | SA | Total Income |
| | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) | Coef. (S.E.) |
| Three years before | -1.30 (1.84) | 0.14 (0.39) | 0.38 (0.36) | -0.05 (0.02) | 0.86 (1.06) | 0.13 (0.31) | 0.15 (0.33) | -0.02 (0.12) | 0.18 (0.16) | 0.48 (2.14) |
| Two years before | 0.37 (1.98) | 0.36 (0.47) | 0.79 (0.52) | -0.12 (0.03) | 0.54 (1.38) | 0.01 (0.37) | -0.08 (0.40) | -0.12 (0.17) | 0.08 (0.21) | 1.83 (2.43) |
| One year before | -0.65 (2.19) | 0.57 (0.48) | 1.83 (0.66) | -0.11 (0.11) | 0.31 (1.55) | 0.53 (0.43) | 0.50 (0.49) | -0.25 (0.21) | 0.25 (0.23) | 2.97 (2.64) |
| Year of displacement | -7.85 (2.82) | 5.31 (0.76) | 0.99 (0.76) | -0.07 (0.20) | -0.75 (1.81) | 1.06 (0.54) | 1.05 (0.67) | -0.23 (0.27) | -0.01 (0.17) | -0.50 (3.06) |
| One year after | -11.39 (3.12) | 2.77 (0.70) | 0.84 (0.81) | 0.07 (0.32) | -1.21 (1.93) | 0.27 (0.46) | 1.04 (0.74) | -0.23 (0.31) | 0.12 (0.17) | -7.72 (3.48) |
| Two years after | -8.96 (3.23) | 0.19 (0.55) | 1.29 (0.87) | 0.11 (0.40) | -4.00 (2.10) | -0.17 (0.47) | 1.81 (0.82) | 0.15 (0.42) | -0.09 (0.16) | -9.65 (3.70) |
| Three years after | -12.44 (3.42) | -0.21 (0.52) | 2.46 (1.00) | 0.10 (0.63) | -5.92 (2.14) | -0.26 (0.39) | 1.15 (0.81) | 0.48 (0.58) | -0.38 (0.22) | -15.02 (3.78) |
| 4-12 years after | -16.89 (4.17) | 5.06 (0.83) | 1.29 (0.53) | 1.88 (0.78) | -5.31 (2.25) | 1.11 (0.60) | -0.08 (0.43) | 0.89 (0.62) | -0.34 (0.21) | -12.40 (4.35) |