Job displacement and household income: Evidence from German survey data

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Abstract Using survey data from the German socio-economic panel (SOEP) this paper analyses – with a particular focus on the household level – to what extent various income sources attenuate income losses after job displacement. Applying propensity score matching and fixed effects estimation techniques, we find high individual income losses and only limited convergence. Income from self-employment slightly reduces the earnings gap and severance payments buffer income losses in the short run. On the household level, we find rather substantial and persistent losses in per capita household labour income. Furthermore, we do not find that an added worker effect contributes to the compensation of the income losses. Considering the role of the tax and transfer system reveals that redistribution by the state plays an important role since losses in post-government household income are rather moderate in the short run and have almost completely vanished after four years.

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1 Introduction

It is often stressed in the economic literature that reallocation – both among continuing firms and through firm entry and exit – is an important driver of productivity growth (see e.g. Syverson 2011) and therefore beneficial for an economy as a whole. However, from the individual affected workers’ point of view, these reallocation processes generate “winners” and “losers”. It has been shown that involuntary job losses due to firm exits or mass layoffs that come along with reallocation and structural change affect, e.g., income, employment, well-being, and mortality of displaced workers and may even spill over to their families. The importance of this issue is well reflected both in public policy debates in modern market economies and in the academic literature (see, e.g., von Wachter 2010 or Brand 2015 for overviews of the literature). Previous research has shown that job displacement has severe and long-lasting negative impacts on individual earnings (e.g. Jacobson et al. 1993, Couch and Placzek 2010, and Hijzen et al. 2010). Besides, the literature has found serious impacts on non-monetary outcomes such as life-satisfaction, health, life expectancy, fertility decisions, and mental health of both displaced workers themselves and their spouses (see e.g. Kassenboehmer and Haisken-DeNew 2009, Black et al. 2015, Sullivan and von Wachter 2009, Del Bono et al. 2012, Huttunen and Kellokumpu 2016, Marcus 2013).

Of course, there are several ways to compensate individual income losses after involuntary job loss. In this context, previous studies have mainly addressed compensation through state transfers, increased labour supply of the spouse, and alternative work arrangements, in particular self-employment (e.g. Eliason 2011, Hardoy and Schöne 2014, Farber 1999a, von Greiff 2009). However, these studies typically focus on selected channels of compensation such as state transfers or increased labour supply of the spouse or on the role of different types of alternative work arrangements. Our paper contributes to this extant literature as it provides a more complete picture of the effects of job displacement on both individual and household income using household survey data from the German socio-economic panel (SOEP). We investigate to what extent, for example, income from self-employment or redistribution by the state attenuate the income losses of displaced workers with a particular focus on the household level.

While most of the hitherto existent literature focuses on individual income losses after job displacement, looking at the household level provides meaningful insights for several reasons: Firstly, even though the number of single households has increased over the last decades, most people are still living in multi-person households.1 Accordingly, negative income shocks as a consequence of job separations do not only affect a single person, but the entire household. Secondly, the household level is relevant for the provision of means-tested state transfers as, e.g., monetary assistance for long-term unemployed in Germany is assigned according to household rather than individual income. Given the positive effects of reallocation for the entire economy, it seems appropriate that the society

1According to census data, only 17% of the Germans lived alone in 2011 (Statistisches Bundesamt 2014).
compensates those workers and their families who are negatively affected by reallocation through layoffs and firm exits. The compensation of income losses through state transfers is therefore particularly interesting as it allows us to gain insights regarding the question to what extent the state and the society as a whole compensate those who are negatively affected by such reallocation processes and structural change. To sum up, by looking at the household level we can observe the degree to which compensation mechanisms succeed in filling the gap in the household budget after involuntary job loss. In addition, our analysis takes account of the fact that not only displaced workers themselves suffer from involuntary job loss, but also their families.

Most of the literature uses administrative data to analyse individual income losses caused by job displacement because these data are usually very reliable and consist of large samples. However, survey data offer several important advantages compared to administrative data. Firstly, survey data allow us to follow individuals even if they enter labour market statuses not included in (German) administrative data (e.g. individuals who enter self-employment or who completely drop out of the labour force). Beyond that, we are able to consider various alternative income sources such as state transfers, severance payments, and income from self-employment. Secondly, the data make it possible to observe not only individuals and their characteristics, but in addition the household, its members, and their resources (income, assets, etc.).

In accordance with the extant literature our results show high losses in individual incomes as well as hardly any convergence within five years since the displacement event. However, income from self-employment slightly reduces the earnings gap and severance payments buffer income losses in the short run. Looking at the household level our estimates show rather substantial and persistent losses in per capita household labour income. Furthermore, we do not find that an added worker effect, i.e. increased labour supply by other household members, contributes to the compensation of income losses after job displacement. Whereas private non-labour income does not reduce income losses at all, redistribution by the state through taxes considerably reduces the income gap even though full convergence is not reached within five years. Estimates for post-government income show only moderate income losses and the income gap has almost completely vanished in the fourth year after displacement. Accordingly, redistribution by the state plays an important role for compensating income losses on the household level after job displacement.

In the following Section 2, we start off with a review of the related literature. In Section 3, we describe our data and present some first descriptive results. Section 4 presents the econometric approach and discusses the regression results as well as several conducted robustness checks. Section 5 concludes.
2 Related literature

A large body of literature has dealt with the impacts of job displacement on different outcomes.\(^2\) The first strand of literature which our paper relates to deals with individual income losses after job displacement. The international literature generally agrees in the finding that job displacement harms income and earning trajectories of affected workers (see e.g. Jacobson et al. 1993 and Couch and Placzek 2010 for the US; Hijzen et al. 2010 and Upward and Wright 2015 for the UK; Oreopoulos et al. 2008 for Canada; Eliason and Storrie 2006 for Sweden; Huttunen et al. 2011 for Norway). However, size and persistence of the effect depend on various heterogeneities such as the business cycle (e.g. Davis and von Wachter 2011 and Couch 2011), the time it takes workers to find a new occupation (e.g. Bender et al. 2002), and individual socio-demographic characteristics like age or level of education (e.g. Kletzer and Fairlie 2003 and Farber 2005). For Germany, empirical evidence on income losses after involuntary job loss is scarce and results are ambiguous due to different data, empirical approaches, and observation periods. Burda and Mertens (2001) use survey data from the SOEP to impute involuntary job losses in administrative data from the Institute for Employment Research (IAB). They find slightly lower wage growth for displaced workers with the strongest effect for workers in the upper part of the pre-displacement wage distribution. Couch (2001) uses SOEP data to estimate the impact of job displacements due to firm closures on earnings and employment of German workers. He finds an immediate reduction in annual earnings by 13.5 per cent, which, two years later, diminishes to an earnings gap of 6.5 per cent. Using administrative data from the Institute for Employment Research, Bender et al. (2002) find moderate wage losses of around 1-2 per cent after displacement, but for workers who are not observed in employment in the year after displacement, an additional wage loss of 19 per cent is observed. While the hitherto presented estimates for Germany are all rather moderate, Schmieder et al. (2010) observe more substantial earnings losses of displaced workers in Germany. In particular, they use administrative data to investigate the long-term impact of mass layoffs during the 1982 recession and find permanent earnings losses of 10-15 per cent that sustain for at least 15 years. They argue that these comparably large income losses are mainly due to the economic downturn of the early 1980s whereas displacements in the other studies occurred during periods of economic prosperity.

Our paper further relates to the literature dealing with compensation of individual income losses, in particular severance payments and self-employment entry. These income sources are often not included in administrative data but the literature outlined below suggests that they might play a non-negligible role. Grund (2006) finds that severance payments are granted quite regularly in Germany and that they amount to around 9,200 € on average\(^3\). However, severance payments can be expected to

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\(^2\) Recent surveys of the literature on the consequences of job displacement are provided by Brand (2015), the OECD (2013), and von Wachter (2010). An overview on the theoretical reasons for income losses after job displacement is provided by Carrington and Fallick (2014).

\(^3\) According to his calculations using SOEP waves from 1991 to 2002, around 25 per cent of male and 32 per cent of female workers receive severance payments (Grund 2006, p. 66).
buffer income losses only in the short run. Beyond that, alternative work arrangements, in particular self-employment, can compensate income losses of those displaced workers who do not get (immediately) re-employed in regular dependent work. According to economic theory, an individual’s reservation wage decreases in case of unemployment. Hence, displaced workers are presumably more likely to become self-employed even if this had not been an option for them before job loss. Against this background, von Greif (2009) finds a substantial increase in the probability to enter self-employment subsequent to job displacement for Sweden. This probability is particularly high for individuals who are disadvantaged with respect to their position in the labour market. For the US and distinguishing between different alternative work arrangements, Farber (1999a) does not find a positive effect of job displacement on the probability to become regularly self-employed, whereas the probability to work as a freelancer is increased. Røed and Skogstrøm (2014) analyse the impact of job loss on entrepreneurial behaviour using Norwegian register data. They find that four years after displacement the probability to be an entrepreneur is raised by 4.8 percentage points for men and 2.3 percentage points for women. The presented studies mainly focus on the effect of job loss on the probability to become self-employed. By contrast, our study analyses to what extent income from self-employment buffers income losses after job displacement.

Beyond that, our paper contributes to the literature that deals with compensation mechanisms in the household context, namely state transfers and the added worker effect, i.e. increased labour supply of the spouse as a reaction to involuntary job loss of the partner. Empirical evidence for the existence of an added worker effect is inconclusive. For the US, Lundberg (1985) finds only a small but significant added worker effect whereas Stephens Jr. (2002) finds substantial and persistent increases in the spouse’s labour supply as a reaction to husband’s displacement. In a more recent study for the US, Kawano and LaLumina (2015) find evidence for an added worker effect for both men and women, but only when the person who is laid off has been the main earner before job loss. In a country comparison study, McGinnity (2002) analyses the added worker effect for Germany and the UK. She finds evidence for an added worker effect in Germany but not for the UK which is likely to be due to differences in the welfare state regimes. Triebe (2015) uses SOEP data to analyse the added worker effect for Germany and finds an added worker effect for both men and women and for married couples while there is no effect for cohabiting couples. Bredtmann et al. (2014) analyse the added worker effect in a cross-country comparison for 28 European countries. An analyses for a pooled sample of these countries reveals that women whose husbands get displaced have a higher probability to enter the labour market (extensive margin) and to change from part-time to full-time employment (intensive margin) than wives whose husbands do not lose their job. Even though women’s probability to enter

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4 In early studies on the added worker effect as Lundberg (1985), the term mainly refers to the “temporary increase in the labour supply of married women whose husbands have become unemployed” (p. 11). However, more recent studies use broader definitions that also include increased labour supply of men and not only married but also cohabiting couples (see, e.g. Triebe 2015).
the labour market increases when their husband becomes unemployed, this does not necessarily mean that they also find a job and can contribute to effectively compensating income losses.\footnote{The same result is found by Giannakopoulos (2015) for Greek women whose husbands involuntarily lost their job during the economic crisis in Greece. While this made women enter the labour market, most of them did not actually start working but registered as unemployed making them formally eligible to receive state transfers.}

Considering both the role of the spouse and the state to provide insurance after involuntary job loss, Ehlert (2012) uses survey data for Germany and the US to analyse the role of these sources for compensation in the two countries. Distinguishing the effects for men and women he finds that if women get unemployed they are mainly insured by their spouses under both institutional set ups. For men in Germany, a country which is characterised by a rather comprehensive welfare state system, income losses of unemployed men are mainly buffered by the state while in the US they rely more on additional income provided by their families. Note that Ehlert (2012) does not focus on involuntary job losses and that he defines job loss as a transition from employment to unemployment without taking the reason for job termination into account. By contrast, our study focuses explicitly on involuntary job terminations and we do not restrict our analysis to job losses with subsequent unemployment spells. Accordingly, results are not directly comparable to ours since the focus of our empirical analysis is on involuntary job loss in general. Hardoy and Schöne (2014) analyse the role of the family and the welfare state to compensate income losses after job displacement in Norway, a country that is characterised by a very generous welfare state system and a large share of females participating in the labour market. It is found that the state plays a more important role than the spouse in compensating income losses after involuntary job loss. Eliason (2011) performs a comparable analysis for Sweden, a country which has very similar institutions as Norway. He finds no evidence for an added worker effect and state transfers are able to compensate a substantial part of the income losses. However, the welfare state is also not able fully compensate long-run earnings losses of displaced workers. For the UK which is characterised by very modest welfare state institutions, Upward and Wright (2015) find that state transfers only slightly reduce the income gap after involuntary job loss.

In the following empirical analysis, we will investigate step by step to what extent the various compensation mechanisms outlined above buffer income losses of displaced workers and their families with a particular focus on the tax and transfer system. Firstly, we follow the classic approach of the literature on income effects of involuntary job loss by examining the impact of job displacement on individual incomes from dependent employment. In addition to that, using survey data allows us to consider alternative income sources such as severance payments and self-employment. Secondly, we investigate compensation mechanisms on the household level, namely state transfers and income of other household members. With respect to the role of the state we distinguish the effects of taxes, child allowances, and other state transfers such as unemployment benefits and social assistance.
3 Data and descriptive evidence

The German Socio-economic Panel (SOEP) is a household panel survey conducted on a yearly basis since 1984. All members of a household aged at least 16 are included in the survey. Starting with a sample of around 6,000 households and 12,000 individuals in 1984, the latest available wave conducted in 2013 by now includes almost 30,000 individuals living in around 11,000 households. The data contain detailed information on socio-demographic characteristics of the respondents and their families as well as various job-related characteristics. The comprehensiveness of the contained income data allows us to gain fundamental insights about the effects of job displacement both on income losses of displaced workers themselves and in the household context.

Since it is the aim of our analysis to investigate how different compensation mechanisms succeed in filling the gap in the household budget after involuntary job loss, we consider eight different income variables. These variables stepwise include various income sources, such as severance payments, income from self-employment, non-labour income, and state transfers. The income variables used for our empirical analysis are described in Table 1. All income variables are deflated to prices in 2010 using the consumer price index. To make households of different size comparable when considering household income, we use equivalence weights according to the OECD-modified equivalence scale which assigns a weight of 1 to the first adult, 0.5 to each additional adult, and 0.3 to each child aged 0 to 14 living in a household. Equivalence weighting takes into account that costs of living do not increase one to one with the number of persons living in the household since numerous goods, such as heating, electricity, and facilities like washing machines or ovens, can be shared by the household members. Accordingly, using equivalence weighted household income allows us to quantify the average per capita income losses of all members of the affected household, including spouses and children.

Involuntary job loss is identified by the following questions: First, respondents are asked whether they have changed (or lost) their job since the last interview. Those who have experienced a job change or have become unemployed are subsequently asked for the reason of that change. For our empirical analysis we consider those workers as displaced who have lost their job due to firm closures and those who have been dismissed by their employers for other reasons. Job displacement can be defined as an “involuntary separation based on operating decisions of the employer” (Farber 1999b, p. 2445) which

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6 For more detailed information on the SOEP see Wagner et al. (2007).
7 Note that our insights do not change when we use other equivalence scales such as the OECD equivalence scale and the square root scale. The OECD equivalence scale uses the same algorithm as the above described OECD-modified scale, but uses different weights, i.e. 1 for the first adult, 0.7 for each additional adult, and 0.5 for each child aged 0 to 14 living in the household. The square root scale uses weights by taking the square root of the total number of persons living in the household. Results are available on request.
8 When using equivalence weights our results may be partly driven by changes in household size. However, looking at household sizes over time reveals that there are hardly any changes in average household size for both displaced and non-displaced workers.
9 Note that many questions in the SOEP, such as earnings or time spent in, e.g., employment, unemployment or maternity leave, refer to the year preceding the interview. Concerning the recording of job changes individuals can indicate that the job change occurred in the previous year or in the year when the interview was conducted. Accordingly, it can occur that job displacements refer to the year of the interview whereas information on incomes and earnings refer to the previous year. We account for this problem by recoding the displacement year in such a way that all relevant variables refer to the year preceding the interview.
implies that displaced workers are laid off due to reasons that are beyond their control and independent of their individual characteristics or performance. Accordingly, our definition of job displacement is rather broad as we also consider dismissed workers. However, this approach is in accordance with previous literature and corresponds to the definition of job displacement used in the Panel Study of Income Dynamics for the US, for example (see, e.g., Stephens 1997 or Farber 2015; see also Marcus 2014 for a discussion about the identification of job loss in the SOEP). Moreover, Grund (1999) finds no significant difference between post-displacement wages of displaced and dismissed workers in Germany.\textsuperscript{10} We consider involuntary job losses occurring between 1990 and 2008 and follow each of these displacement cohorts 4 years prior to and 5 years after job loss. The control group is constructed by randomly assigning a fictitious year of displacement to those who have not been displaced in the period of observation. Both our treatment and control group include workers who were full-time employed\textsuperscript{11} non-civil servants aged under 55 in the year prior to (fictitious) displacement.\textsuperscript{12} In addition, due to the unusual economic conditions in Eastern Germany after the fall of the Berlin Wall and the limited period of observation, we consider only individuals working in firms situated in the western part of Germany in the year prior to displacement.

Figure 1 shows the development of individual and household incomes (as described in Table 1) for displaced and non-displaced workers. One can see from all income variables that displaced workers have on average lower incomes than non-displaced workers already before displacement (which occurs in year 0). Individuals experience substantial cuts in all income variables after displacement. Data for the individual level further suggest that income from self-employment reduces these losses both in the short and the long run and severance payments substantially lessen the income drop in the displacement year.

Looking at the household level, which is more relevant for individual workers and their families, our results show that losses in total family labour income are overall smaller than on the individual level. This is mainly because losses are spread over all members of the household due to equivalence weighting. In contrast to income losses at the individual level, equivalence weighted household income takes into account that not only displaced workers themselves suffer from the income losses due to involuntary job loss but other members of their households as well. Accordingly, this measure accounts for the fact that the number of persons affected by job displacements is much higher than the raw number of displaced workers. Another possible reason for lower income losses at the household

\textsuperscript{10} As a robustness test we compared earnings losses of workers who have been displaced due to plant closures and those who have lost their jobs due to other reasons. The results of this robustness test, which is discussed in section 4.3, reveal that income losses of dismissed workers are slightly higher than income losses of workers displaced due to firm closures. However, the broad picture of our analysis is not affected by this differentiation.

\textsuperscript{11} Individuals who only work part-time before displacement are excluded because we want to ensure that job displacement affects a major income source of the household.

\textsuperscript{12} In case of multiple job losses we only consider the first job loss of an individual. To ensure that households are unambiguously identified as part of the treatment or the control group, we exclude households from the control group if any household member has been displaced during the period of observation.
level is additional labour income due to increased labour supply of other household members. Whether such an added worker effect contributes to compensating income losses will be investigated below.

When comparing household labour income and total pre-government income one cannot see a substantial difference between these two income variables. This suggests that non-labour income sources such as asset incomes or rental income that are included in the pre-government income variable do not play an important role for buffering income losses after displacement. However, after subtracting the total amount of yearly taxes paid by the household, the gap is already substantially reduced.

Accordingly, taxes as a means of redistribution by the state remove a part of the income gap between displaced and non-displaced workers both prior to and after displacement. Adding child allowances leads to slightly higher incomes for both displaced and non-displaced workers. Looking at post-government income reveals that other state transfers – in particular unemployment benefits and social assistance – considerably reduce both permanent differences between displaced and non-displaced workers and the income drop after displacement. Accordingly, these descriptive results suggest that taxes and state transfers are important means to reduce income losses of displaced workers and their families, but there is hardly any convergence observable after displacement since the income gap remains rather constant after displacement.

Table 2 shows means of selected socio-demographic and job-related variables for displaced and non-displaced workers in the year prior to (fictitious) displacement. Displaced workers are on average younger and have less firm tenure and job experience than their non-displaced counterparts. They are also on average less educated as they are, for example, more likely to have obtained at most general elementary education and less likely to have a university degree. These differences in human capital endowments are in line with the lower income of displaced workers already before displacement. Individuals affected by involuntary job loss also have a higher probability to be employed in small firms. This is in line with previous findings on the higher closing and job destruction rates of these firms.\textsuperscript{13} It also corroborates with empirical evidence on the relationship between firm size and wages which shows that workers in large firms obtain higher wages than workers in small firms (see e.g. Fackler et al. 2015 for recent evidence for Germany).

Looking at the household composition, one can see that on average 3.02 persons including 0.77 children live in displaced workers’ households, i.e. 3.02 persons and 0.77 children among them are on average affected by one involuntary job loss and its consequences. The results further show that displaced workers live in households with a slightly larger number of household members than their non-displaced counterparts. While the share of individuals living in single households is almost identical for displaced and non-displaced workers, displaced workers live more often in multi-person households.

\textsuperscript{13} See, e.g., Fackler et al. (2013) for an analysis of the relationship between firm size and exit risks and Fuchs and Weyh (2010) for the relationship between firm size and job creation and destruction.
households with children than non-displaced workers. This is also reflected by the finding that their average number of children is slightly higher. Moreover, displaced workers have a higher probability to be unmarried and to be at risk to be poor.14

4 Econometric analysis

Our descriptive results yield two core findings: First, when we look at the characteristics of displaced and non-displaced workers prior to (fictitious) displacement, we find substantial differences between these two groups. These findings suggest that displaced workers are not randomly selected, but rather a particularly disadvantaged group within the working population. Secondly, we do not only find severe income losses after displacement, but also a huge gap in incomes prior to job displacement, which is in line with the differences in pre-displacement characteristics (pre-displacement income trends are, however, remarkably similar). Hence, we apply an econometric strategy which combines a matching approach with individual fixed effects estimations. This allows us to take account of both differences in observable pre-displacement characteristics and differences in time-invariant unobserved characteristics.

In the first step we perform 1-to-1 nearest neighbour propensity score matching without replacement. To make sure that we compare displaced and non-displaced workers facing similar general economic conditions, we only allow for matches within the same year. This means that we only match individuals who experienced a displacement or a fictitious displacement in the same year. As covariates for the computation of the propensity score we include various socio-demographic characteristics (age, age squared, gender, marital status, number of children, household size, an indicator for living in an urban or rural area, and the federal state someone is currently living in), as well as variables representing educational attainment and employment (level of education, work experience, work experience squared, firm tenure, firm tenure squared, 2-digit industry, and firm size). The characteristics refer to the year before displacement. After matching, we end up with a sample of 939 displaced workers and the same number of non-displaced counterparts. Test results for the matching quality show that, except for one out of more than 50 covariates, there are (on the 5% significance level) no significant differences between displaced and non-displaced workers in the matched sample. Moreover, the median (mean) of the standardized bias is reduced from 6.7 (12.8) in the unmatched sample to 1.8 (2.5) in the matched sample.15

The subsequently estimated fixed effects regressions take on the following form:

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14 It is commonly defined that individuals whose equivalence weighted household income is lower than 60% of the median income are at risk to be poor (see, e.g. http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:At-risk-of-poverty_rate). Accordingly, we use equivalence weighted post-government household incomes in our data and calculate the median income for each sample wave. After that, a dummy variable is generated for each year that indicates whether a household is above or below this threshold in the respective year. This allows us to see whether households of displaced workers are at higher risk to be poor than households of non-displaced workers.

15 Caliendo and Kopeinig (2008) state that a standardized bias below 3 or 5% can be regarded as sufficient.
\[ Y_{it} = \alpha_i + \sum_{k=-3}^{5} \gamma_k T_k + \sum_{k=-3}^{5} \delta_k D_i T_k + \nu_{it} \]

On the left hand side, \( Y_{it} \) represents the different income variables on the individual and the household level (for person \( i \) in year \( t \)). \( \alpha_i \) captures individual fixed effects. \( T_k \) represents dummies for the \( k^{th} \) year relative to fictitious displacement and \( \gamma_k \) the corresponding coefficients which measure the income development for the control group. \( D_i T_k \) represents interaction terms of the relative time dummies \( T_k \) with a time invariant dummy \( D_i \) which identifies displaced workers. The corresponding coefficients of these interaction terms \( \delta_k \) catch the effect of relative time to actual displacement and measure the difference in the income development between displaced and non-displaced workers. \( \nu_{it} \) is an idiosyncratic error. Standard errors are adjusted for clustering at the personal level. The subsequent section discusses our baseline results for the whole sample, i.e. all 939 displaced and non-displaced workers.

### 4.1 Baseline estimation results

Figure 2 shows the coefficients \( \delta_k \) of the interaction terms between the relative time dummies and the displacement dummy. Overall, our results for individual incomes corroborate with previous findings as they show substantial and persistent income losses for displaced workers. Losses are highest in the first year after displacement and there is only little convergence observable in the subsequent years. Starting with individual labour income without severance payments and without income from self-employment – the type of income which is also contained in German administrative data – we find that displaced workers suffer a severe income loss of around 14,000 € in the first year after displacement compared to their non-displaced counterparts. Five years after displacement, the income gap between displaced and non-displaced workers has shrunk only to about 10,000 € indicating that there is merely little convergence in income from dependent employment within our period of observation. Including income from self-employment reduces the income gap both in the short and the long run, but only to a small extent (around 2,000 € per year). Severance payments reduce the income drop substantially in the year of displacement and slightly in the first year after the job loss, but – as expected – have no effect in the long run. Overall, involuntary job loss has a strong negative impact on individual incomes and our results suggest that individual workers hardly recover from this shock within the time span considered in our analysis.

Figure 3 shows the results for household incomes of displaced workers. As stated in section 3, losses in equivalence weighted household income measure the average per capita effects of involuntary job loss for each member of affected households which is why losses in are lower than on the individual level. In the first year after displacement, we find a gap in household labour income between displaced and non-displaced workers of around 6,000 € whereas after five years, a gap of only around 3,000 € remains. The added worker effect, i.e. increased labour supply of the partner as a reaction to an
individual’s job loss, can be one reason for lower labour income losses on the household than one the individual level. To check this hypothesis, we re-estimated our baseline regression with the (unweighted) labour income of all other household members but the displaced worker’s as the dependent variable. The estimation results that are presented in Figure 4 show that there is no clear-cut relationship between job displacement and labour income of other household members, not least because the respective coefficients are not statistically significant at all. Hence, an added worker effect does not seem to contribute to compensating income losses after job displacement. Results for total pre-government income are almost identical to those for household labour income which reveals that the additional income sources comprised in pre-government income (income from assets, private transfers and private pensions) do not reduce the income gap between displaced and non-displaced workers. It might be that displaced workers do not have access to these additional income sources which means that they can, of course, not work as income buffers in case of involuntary job loss.

Net household income comprises pre-government household income and subtracts the yearly amount of taxes paid by the household. The results for net household income reveal that redistribution by the state through taxes reduces the income gap between displaced and non-displaced workers by almost one half in the year after displacement compared to pre-government household income. This effect continues in the longer-run as, after five years, the gap in net household income has shrunk to around 1,600 € compared to 2,800 € for pre-government income. In the next step, we add the sum of yearly child allowances received by the household to net household income. We think that it is interesting to separately consider this direct state transfer as it reflects to some extent displaced households’ fertility decisions compared to the control group. Including child allowances slightly increases the income gap between displaced and non-displaced workers in comparison to pure net household income. Although the difference is very small, it indicates that couples who experience involuntary job loss receive less child allowances than their non-displaced counterparts. This suggests that involuntary job loss has a slightly negative impact on fertility of affected households which is in line with previous findings concerning the relationship between job loss and fertility.

Finally, the results for post-government household income show much more moderate losses than suggested by the losses in gross (pre-government) household income. In the year of displacement there is, surprisingly, a positive effect on post-government income, which can be explained as follows: Remember that there is only a small reduction in household labour income in the year of displacement. The reason is that displaced workers receive severance payments that reduce the income drop in the

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16 As reactions of household members might be different depending on the gender of the person who lost her job, we additionally ran separate estimations for men and women. This is because men are still more often the main earner of the family whereas it is more common for women to provide a secondary income for the household budget or they even do not work at all. Accordingly, we would expect a stronger reaction of the household in case of a man’s job loss than in case of a woman’s. However, again we do not find evidence for an added worker effect.

17 Del Bono, Weber, and Winter-Ebmer (2012) and Huttunen and Kellokumpu (2016) find a negative impact of female job displacement on fertility. Displacement of men, however, does not seem to impact fertility decisions of couples. Accordingly, we run separate regressions for men and women, which are presented in section 4.2. However, one has to keep in mind that we focus only on workers who were full-time employed prior to displacement.
displacement year substantially (as shown in our analysis for the individual level). In addition, most displaced workers already receive unemployment benefits in the year of displacement which is why post-government income is on average higher for displaced workers than for their non-displaced counterparts. While the largest drop in the other income variables is observable in the year after displacement, we find the highest but still moderate gap in post-government income (around 1,800 €) in the second year after displacement. This can be explained by the fact that unemployment benefits, which depend on earnings before job loss, are usually paid for one year in Germany. Hence, workers who do not find a new job within one year experience an additional drop in post-government household income as unemployment benefits are substantially cut down to means-tested social assistance. In the third year, a process of convergence seems to start and after four years, post-government income of displaced workers has almost returned to its pre-displacement level.

To sum up, our baseline results corroborate with the extant literature as we find substantial and rather persistent losses in individual income. Taking the household context into account allows us to quantify the average per capita income loss of displaced workers and their families which accounts for the fact that on average three persons are affected by one job loss. The results for the household level reveal that gross income losses are still substantial and long-lasting and that state interventions in terms of redistribution through taxes and transfers play an important role in compensating the income losses of displaced workers and their families.

4.2 Income losses differentiated by gender

In this section we present results separately for male and female job loss. This renders important insights since the income losses after involuntary job loss may differ by gender for the following reasons: First, men have on average higher earnings than women which is why income losses can be expected to be higher in case of male job loss. Second, women are generally more likely to work part-time or to drop out of the labour force (see e.g. Ehlert 2012 or OECD 2007) which implies that losses may be higher and more persistent in case of female job loss. It is therefore theoretically open whether losses in gross income are higher for displaced men or women.

Results for the effects of male and female job loss on individual income are depicted in Figures 5 and 6. The male sample consists of 1,285 displaced and non-displaced workers, the female sample of 593 persons. With respect to individual income, patterns are overall very similar for men and women even though women show slightly lower immediate income losses from dependent employment. For women income from self-employment does not buffer income losses at all whereas it reduces the income gap for men by around 2,000 € both in the short and the long run. This result is further supported by the finding that the share of self-employed in the matched sample is around 4 percent for displaced men in the year after displacement whereas this figure amounts to only 1 percent for displaced women. In order to investigate whether the probabilities to work full or part-time are differently affected by job loss for men and women, Figures 7 and 8 depict the shares of individuals in
full-time employment and employment in full and part-time, respectively. This indicates to what extent income losses of males and females might be driven by different employment patterns after displacement. In Figure 7 it can be seen that the share of full-time employees is overall higher for men than women (except for the year prior to displacement in which all individuals are required to work full-time by our sample restrictions). Furthermore, the difference in the share of full-time employees between displaced and non-displaced workers is only slightly higher for women than for men. Comparing the shares of individuals in full-time employment (Figure 7) and in employment without differentiating between full- or part-time (Figure 8) reveals that women are generally more likely to work part-time. The difference in employment probabilities between displaced and non-displaced workers is again very similar for men and women. These results are in line with the above presented results for individual income losses which revealed similar patterns for men and women with slightly higher losses for men.

Figures 9 and 10 show the results for household incomes of displaced men and women, respectively. Comparing household labour income or pre-government income (which does not make any substantial difference) of displaced men and women, our results are in line both with previous findings in the literature (see, e.g., Huttunen and Kellokumpu 2016) and with our results for the individual level as we see slightly higher income losses in case of male than female job loss. The same applies to net household income. In the year after displacement the income difference between displaced and non-displaced workers amounts to around 4,000 € for men and 2,500 € for women. Five years after displacement, we still find an income gap of around 2,000 € for men whereas the difference between displaced and non-displaced women amounts to only around 1,000 €. There may be two reasons for this finding: Firstly, this may simply reflect the overall higher income losses of displaced men compared to women. Secondly, this may be due to incentives incorporated in the German tax system which generates advantages for married couples. Specifically, married couples can be jointly assessed by tax authorities and pay over all a lower tax rate, which decreases ceteris paribus with the income difference between the spouses. This may generate incentives for women – who are usually not the household’s main earner – to work part-time or to drop out of the labour force. This is in accordance with Figures 7 and 8 which show that – both in the group of displaced and non-displaced workers – the share of full-time employees (Figure 7) as well as the probability to participate in the labour market (Figure 8) are considerably higher for men than for women. The resulting monetary advantages combined with the higher probability of women to work part-time after involuntary job loss may be another explanation for lower net household income losses of female than male displaced workers.

What is more, including child allowances does not make a substantial difference compared to net household income. Finally, considering post-government household income shows results that are

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18 This is in accordance with Huttunen and Kellokumpu (2016) who find a stronger loss in family income for displaced men than for women, but very similar individual income losses of men and women.

19 In order to make a more precise statement about female income losses in the household context we exclude single households from our separate regressions for men and women. Results are similar to those for household income losses of displaced female workers including all types of households which makes our results even more reliable.
quite similar in magnitude for displaced men and women, although the income gap between displaced and non-displaced women is no longer statistically significant. Taken together, one can conclude that the overall effects of involuntary job loss on household income are very similar for men and women.

4.3 Further heterogeneities and robustness tests

Beyond the results presented above, we have investigated several further heterogeneities and run a number of robustness tests (results are available on request). First, our period of observation includes one of the most extensive labour market reforms of the last decades in Germany, namely the Hartz reforms. The most important part of this labour market policy reform which included severe impacts on state transfers for unemployed workers and their families was implemented in January 2005 (see, e.g., Hüfner and Klein 2012 for more details on the Hartz reforms). Hence, one could suspect that post-government household income losses were affected by this reform. In order to test this hypothesis we run separate regressions for workers displaced prior to and since 2005, respectively. We find overall very similar patterns to our baseline results even though losses are slightly higher for workers who experienced an involuntary job loss after the Hartz reforms. However, in terms of interpretation of this finding it must be kept in mind that the two displacement cohorts lost their jobs under different macro-economic conditions which is why higher losses of workers displaced after the Hartz reforms cannot be unambiguously ascribed to this particular change in labour market policies. Nevertheless, the analysis shows that the changes in labour market policies accompanied by the Hartz reforms did not have substantial negative income effects on displaced workers and their families.

Second, we address the fact that we included both workers who lost their jobs due to plant closures and due to dismissals in our sample of displaced workers. As argued above, this is generally in line with previous literature on the effects of job displacement (see, e.g. Stevens 1997 and Marcus 2014). However, Gibbons and Katz (1991) find that dismissed workers have higher earnings losses than workers displaced due to plant closures. They argue that this is due to stigma effects which might occur because dismissed workers are selected based on their ability whereas this type of within-plant selectivity is not possible in case of plant closures. By contrast, Krashinsky (2002) argues that higher losses of dismissed workers are due to differences in pre-displacement plant size because small plants are more often affected by closures and pay on average lower wages. For Germany, Grund (1999), however, does not find differences in earnings losses of dismissed workers and those affected by plant closures at all. To examine whether there is a difference in income losses of these two kinds of displaced workers observable for our sample, we include interaction terms in our baseline estimations to segregate the effects of involuntary job loss for dismissed workers and workers displaced because of plant closures. Our results reveal that dismissed workers suffer slightly higher income losses both on the individual and on the household level. This proves evidence for the fact that dismissed workers are indeed worse off than those laid off during plant closures. Further descriptive evidence shows that dismissed workers have, on average, lower earnings from dependent employment at all points in time
relative to the displacement which suggests that dismissed workers are particularly disadvantaged already before the job loss. Accordingly, our estimated effects of involuntary job loss on subsequent incomes of displaced compared to non-displaced workers (in absolute numbers) may be higher than they would be if we only considered displacements due to plant closures. However, income trajectories are very similar for displaced and dismissed workers, which is why our main insights are not affected.

Third, we address the problem that job losses, in particular due to plant closures, might anticipated by affected plants’ work forces which allows employees to strategically react to an upcoming displacement event by leaving their firm before it finally closes down. In this context, Schwerdt (2011) finds that so-called “early leavers”, i.e. those workers who leave closing plants already before the final shut-down, have better post-displacement outcomes than those who stay until the end. Accordingly, this implies that those who stay until the end are a rather selective group of low ability workers which is why studies that make use of linked employer-employee data include early leavers in the group of displaced workers. Since this is not possible with our data we address this aspect by making use of a question included in the SOEP that asks individuals about their self-assed job security and re-estimate our baseline models by distinguishing expected and unexpected job losses. An unexpected job loss is defined as a job loss that was not expected one year before the job loss. Overall, the effects of an unexpected job loss on individual incomes are very similar to our baseline results suggesting that our measure is well applicable to approximate the effect of unexpected involuntary and therefore exogenous job loss. Moreover, individuals who expected the job loss have overall slightly higher individual income losses than those who did not see the job loss coming. Interestingly, this effect is not observable for the household level. Households seem to adapt better to an expected job loss than individuals alone. Hence, we conducted an analysis of the added worker effect differentiated by expected and unexpected job loss in order to check whether this better adaption of households who expected the job loss is reflected in increased labour incomes of other household members. The results in Figure 11 show that there is indeed a positive effect of expected involuntary job loss on household labour income of all other household members (effects are statistically significant in the three years subsequent to the job loss). Unexpected job losses, however, do not significantly affect household labour incomes of other household members.

Fourth, we test our results using two alternative equivalence scales, i.e. the OECD equivalence scale and the square root scale (see Footnote 7 above for a more detailed description of the weighting schemes). Overall, the pattern of income losses remains widely unchanged. In absolute numbers and compared to our baseline results losses are lower when we use the OECD equivalence scale and higher when the square root scale is applied. This is, however, not surprising as it corresponds to the resulting weights of each equivalence scale which produce the highest per capita incomes with the square root

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20 Against the argument of Krashinsky (2001) our analysis does not reveal that dismissed workers are more often employed in larger firms than workers displaced due to plant closures.
scale (as it results in the smallest denominators) and the lowest per capita income when the OECD equivalence scale is applied (which produces the largest denominators). Accordingly, our results are robust to different equivalence scales and our choice to use the commonly used OECD-modified scale is as well justified as it results in per capita household income losses that are in between those of the two other more extreme alternatives.

5 Conclusion

Using household survey data from the German socio-economic panel (SOEP) we investigated the impact of job displacement on individual and household incomes of affected workers and their families. We estimated income losses after involuntary job loss by comparing workers who experienced a job loss between 1990 and 2008 to their non-displaced counterparts using an econometric approach that combines propensity score matching and fixed effects regressions. On the individual level, we found substantial and rather persistent income losses of displaced workers compared to their non-displaced counterparts. Furthermore, our results reveal that income from self-employment slightly reduces individual income losses in the short and in the long run for men but not for women. Severance payments buffer the income drop considerably in the year of displacement and slightly one year later, but – as expected – have no impact in the longer run. However, even when these additional income sources are considered, the income gap is only reduced by one third five years after displacement, which indicates that job displacement has a severe and long-lasting negative impact on income trajectories of affected individuals. These results for the individual level are mainly in line with the extant literature as it has been continuously found (especially for the US) that involuntary job loss causes severe and persistent individual income losses (e.g., Jacobson et al. 1993, Couch and Placzek 2010). Compared to the hitherto existing evidence for Germany our estimated individual income losses are rather high (see, e.g., Burda and Mertens 2001, Couch 2001, Bender et al. 2002) and resemble most the estimates of Schmieder et al. (2010) who examined the effects of job displacements that occurred during the economic crisis of the early 1980s. However, these differences can be a result of different econometric approaches, data, time-spans, and imposed sample restrictions. Despite, our approach should be well suited to estimate average income loss of workers affected by involuntary job loss because our period of observation covers job displacements that occurred over almost twenty years. Hence, it can be assumed that our approach captures the average effects of job displacements under different economic conditions. Moreover, our imposed sample restrictions ensure that the intended group of prime age workers in dependent employment is included, but does not neglect individuals who, e.g., drop out of the labour force or become self-employed after job loss.

Looking at the household level reveals rather substantial and persistent losses in per capita household labour income. Estimates for net household income show that redistribution by the state through taxes considerably reduces the income gap after involuntary job loss. Finally, when we look at post-government household income we still find small income losses, but the income gap between
displaced and non-displaced workers has almost completely vanished four years after job loss. Our results suggest that redistribution by the state through taxes and unemployment benefits is mainly responsible for a reduction in per capita income losses on the household level. Moreover, we find no substantial differences in the effects of involuntary job loss for males and females compared to their non-displaced counterparts. Furthermore, with respect to the labour supply reactions of other household members after involuntary job loss our results are in line with previous literature as many studies do not find evidence for the existence of an added worker effect (see, e.g., Eliason 2011 and Hardoy and Schöne 2014). Also, previous literature has shown that state transfers are generally an important means to buffer income losses after involuntary job loss, but to a larger extent in social welfare state regimes like the Scandinavian countries than in liberal welfare states as the US or the UK (see, e.g., Upward and Wright 2015 and Hardoy and Schöne 2014). To sum up, our results reveal that the German welfare state buffers income losses of families affected by job displacement to a large extent whereas individual reactions contribute only little to the compensation of the income losses after job displacement.

Despite our findings that the state considerably reduces income losses of displaced workers and their families, it must be kept in mind that this paper only deals with the monetary effects of involuntary job loss. Job displacement may still have severe negative effects, e.g., on health, life satisfaction, mortality, and employment outcomes of affected workers. Moreover, spill over effects may be an important issue as involuntary job loss negatively affects educational attainment and future employment outcomes of children of displaced workers. Accordingly, even though state transfers seem to be effective in securing the economic situation of the family, the disruption of daily structures, social contacts, and social acceptance that are accompanied by a job loss are further aspects that are not reflected in the pure monetary effects of job losses. To sum up, our results show that the German welfare state is able to buffer income losses of displaced workers and their families quite well. However, the high and persistent individual income losses suggest that individuals do not recover that easily from involuntary job loss. Beyond pure monetary support, more targeted active labour market policies may be suitable means to improve the employment prospects of displaced workers. For example, it has been shown for Germany that start-up subsidies can improve both the earnings and employment situation of previously unemployed workers (Caliendo and Künn 2011).

Moreover, one has to keep in mind that redistribution and transfers by the state may affect individual job search behaviour. With respect to unemployment benefits, empirical evidence has shown a clear positive relationship between the length of unemployment benefit reception and unemployment duration whereas analyses of long-term effects on post-unemployment wages have rendered

\[21\] Concerning spill over effects of parental job displacement on children’s employment outcomes, Brand and Thomas (2014) find a negative effect of the job displacement of single mothers on their children’s educational attainment for the US. For Canada, Oreopoulos et al. (2008) find negative impacts of fathers’ job displacement on their sons’ subsequent earnings as well as an increased likelihood to become recipients of unemployment insurance and social assistance. Maeder et al. (2015) find a negative correlation between German fathers’ displacement and subsequent employment outcomes of their sons, even though they do not find evidence for a causal effect.
ambiguous results. On the one hand it can be argued that longer unemployment benefit duration allows individuals to find better and more stable employment which is in favour of longer unemployment benefit durations (see, e.g., Nekoei and Weber 2015). On the other hand longer unemployment benefit durations can make individuals reluctant to search intensely for a new job which may cause longer unemployment duration which is accompanied by skill depreciations and stigmatization and, hence, lower post-unemployment wages (see, e.g., von Wachter and Bender 2014). In this context, Schmieder et al. (2012) argue that unemployment benefit duration should be flexibly adjusted according to the economic situation with longer duration in recessions. Taken together, one cannot clearly state to what extent the state should provide compensation of income losses after involuntary job losses. One always has to take account of the incentives imposed on individuals by the welfare state. However, as reallocation and structural change are beneficial for the entire economy, it seems appropriate that those who suffer from the consequences of firm exits or layoffs that come along with these processes are compensated accordingly.
References


### Tables

<table>
<thead>
<tr>
<th>Income variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual labour income from dependent employment</td>
<td>Yearly gross individual labour income from dependent employment, without income from self-employment and severance payments</td>
</tr>
<tr>
<td>Individual labour income without severance payments</td>
<td>Yearly gross individual labour income from dependent employment and income from self-employment without severance payments</td>
</tr>
<tr>
<td>Individual labour income</td>
<td>Total yearly gross individual labour income including income from self-employment and severance payments</td>
</tr>
<tr>
<td>Household labour income</td>
<td>Total yearly gross labour income of all household members</td>
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<tr>
<td>Pre-government household income</td>
<td>Total yearly gross household income from labour earnings, private transfers, private pensions, and asset income</td>
</tr>
<tr>
<td>Household net income</td>
<td>Pre-government household income minus household taxes</td>
</tr>
<tr>
<td>Household net income plus child allowance</td>
<td>Pre-government household income minus household taxes plus child allowance</td>
</tr>
<tr>
<td>Post-government household income</td>
<td>Total yearly post-government income (includes all income sources, after taxes)</td>
</tr>
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*Table 1: Description of income variables.*

Note: All income variables are deflated to 2010 prices. Household incomes are equivalence weighted using OECD-modified equivalence weights.
<table>
<thead>
<tr>
<th></th>
<th>displaced</th>
<th></th>
<th>non-displaced</th>
<th></th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Mean</td>
<td>Std. Dev.</td>
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<td>Age*</td>
<td>36.2989</td>
<td>9.7391</td>
<td>41.9976</td>
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<td>Female</td>
<td>0.3032</td>
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<td>Firm tenure (years)</td>
<td>6.0276</td>
<td>7.1205</td>
<td>11.8405</td>
<td>9.5249</td>
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<td>Job experience (years)</td>
<td>12.6342</td>
<td>9.4327</td>
<td>18.2057</td>
<td>11.0871</td>
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<tr>
<td>Firm size (dummies)</td>
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<tr>
<td>&lt;=20</td>
<td>0.3290</td>
<td>0.4701</td>
<td>0.1628</td>
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<tr>
<td>21-199</td>
<td>0.3428</td>
<td>0.4749</td>
<td>0.2605</td>
<td>0.4390</td>
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<tr>
<td>200-1999</td>
<td>0.1869</td>
<td>0.3900</td>
<td>0.2802</td>
<td>0.4492</td>
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<td>2000 or more</td>
<td>0.1413</td>
<td>0.3484</td>
<td>0.2965</td>
<td>0.4568</td>
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<td>Level of education (dummies)</td>
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<tr>
<td>No school degree at all</td>
<td>0.0525</td>
<td>0.2232</td>
<td>0.0298</td>
<td>0.1700</td>
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<td>General Elementary</td>
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<td>Middle Vocational</td>
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<td>Vocational plus Abi</td>
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<td>divorced/ separated</td>
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<td>0.0903</td>
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<td>Other</td>
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<td>Household size (no. of persons)</td>
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<td>1.4787</td>
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<td>0.9811</td>
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<td>Single</td>
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<td>Multi-person household without children</td>
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<td>poor (dummy)</td>
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<td>Number of persons</td>
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<td>3,390</td>
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*Table 2: Means of selected variables for displaced and non-displaced workers.*

Note: The table shows own calculations of mean values using data from the SOEP and comprises the displacement cohorts 1990-2008. For age, we calculate the mean for displaced and non-displaced workers in the year of (fictitious) displacement; all other variable means refer to the year prior to (fictitious) job displacement. Included are only individuals with non-missing information on all included characteristics as well as the income variables in the year before displacement.
Figures

Figure 1: Means of incomes of displaced and non-displaced individuals over time.

Note: Results are based on own calculations from SOEP sample waves 1987-2013. The horizontal axis depicts years relative to (fictitious) job loss are displayed with the base year t=0, yearly incomes in Euro deflated to prices in 2010 are shown on the vertical axis. We included only individuals with non-missing information on the covariates of interest displayed in Table 2 below as well as none of the income variables in the year prior to displacement which leaves us with 1,161 displaced and 3,390 non-displaced workers in the year before displacement.
Figure 2: Fixed effects estimates of the costs of job loss on individual incomes over time.
Note: Results refer to the matched sample of displaced and non-displaced workers. The horizontal axis depicts time relative to the job loss in the base year t=0, income losses in Euro deflated to prices in 2010 of displaced workers compared to their non-displaced counterfactuals are shown on the vertical axis.

Figure 3: Fixed effects estimates of the costs of job loss on equivalence weighted household incomes over time.
Note: Results refer to the matched sample of displaced and non-displaced workers. The horizontal axis depicts time relative to the job loss in the base year t=0, income losses in Euro deflated to prices in 2010 of displaced workers compared to their non-displaced counterfactuals are shown on the vertical axis.
Figure 4: Fixed effects estimates of the impact of job loss on absolute total household labour income of other household members but the displaced workers’.
Note: We use deflated total unweighted household labour income of other household member to analyse the added worker effect. Results refer to the matched sample. The horizontal axis depicts time relative to the job loss in the base year t=0, household labour incomes of all other household members except for the displaced workers’ compared to their non-displaced counterfactuals are shown on the vertical axis. Note that all coefficients are insignificant on the 10% significance level.

Figure 5: Fixed effects estimates of the costs of job loss on individual incomes over time.
Note: Results refer to the matched sample of male displaced and non-displaced workers. The horizontal axis depicts time relative to the job loss in the base year t=0, income losses in Euro deflated to prices in 2010 of displaced workers compared to their non-displaced counterfactuals are shown on the vertical axis.
Figure 6: Fixed effects estimates of the costs of job loss on individual incomes over time.
Note: Results refer to the matched sample of female displaced and non-displaced workers. The horizontal axis depicts time relative to the job loss in the base year $t=0$, income losses in Euro deflated to prices in 2010 of displaced workers compared to their non-displaced counterfactuals are shown on the vertical axis.

Figure 7: Shares of full-time employed displaced and non-displaced workers differentiated by gender.
Note: Results refer to the matched sample of displaced and non-displaced workers. The horizontal axis depicts years relative to displacement with the base year of job loss $t=0$, shares of individuals per group working in full-time employment are shown on the vertical axis. Notice that, by construction of our sample, all individuals are full-time employed in the year before displacement.
Figure 8: Shares of full-time or part-time employed displaced and non-displaced workers differentiated by gender.
Note: Results refer to the matched sample of displaced and non-displaced workers. The horizontal axis depicts years relative to displacement with the base year of job loss $t=0$, shares of individuals per group working in full-time or part-time employment are shown on the vertical axis. Notice that, by construction of our sample, all individuals are full-time employed in the year before displacement.

Figure 9: Fixed effects estimates of the costs of job loss on equivalence weighted household incomes over time.
Note: Results refer to the matched sample of male displaced and non-displaced workers. The horizontal axis depicts years relative to displacement with the base year of job loss $t=0$, income losses in Euro deflated to prices in 2010 of displaced workers compared to their non-displaced counterfactuals are shown on the vertical axis.
**Figure 10:** Fixed effects estimates of the costs of job loss on equivalence weighted household incomes over time
Note: Results refer to the matched sample of female displaced and non-displaced workers. The horizontal axis depicts years relative to displacement with the base year of job loss $t=0$, income losses in Euro deflated to prices in 2010 of displaced workers compared to their non-displaced counterfactuals are shown on the vertical axis.

**Figure 11:** Fixed effects estimates of the impact of job loss on absolute total household labour income of other household members but the displaced workers’ differentiated by expected and unexpected job loss.
Note: We use deflated total unweighted household labour income of other household members to analyse the added worker effect differentiated separately for expected and unexpected job loss. Results refer to the matched sample. The horizontal axis depicts time relative to the job loss in the base year $t=0$, household labour incomes of
all other household members except for the displaced workers’ compared to their non-displaced counterfactuals are shown on the vertical axis.