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The Effects of Displacement on Self-employment Survival

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Abstract: A large literature has studied the effect of displacement on labor market outcomes in general, but none has evaluated how the displaced manage as self-employed. This paper studies how the survival of the business is affected by displacement in connection to entry, using a discrete-time proportional hazard model on a matched sample of displaced and non-displaced individuals. The main result of the paper is that, as a consequence of previous displacement, the probability of switching from self-employment to paid employment decreases and the probability of switching to unemployment is unaffected.

JEL Codes: J24; J63; J65; M13

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1 Introduction

Extensive worker displacements have become a common reality in Western societies in the last few decades. As the phenomenon has become increasingly frequent, the literature on the subject has grown quite large. Several papers have studied the individual's cost of worker displacement by estimating earning losses, spells and duration of unemployment. The papers typically find that displaced workers face less favorable conditions on the labor market, with more frequent and longer spells of unemployment and smaller earnings. In response to the tougher conditions following displacement, Nykvist (2008) finds that the probability of self-employment is increased. Although a large literature has evaluated the impact of displacement on the labor market in general, no one has evaluated how the displaced succeed as self-employed.

In this paper, I attempt to answer the question of whether the survival of a firm is affected by previous displacement. Based on the previously presented evidence of a less favorable position on the labor market, the displaced should be expected to remain longer in self-employment since the outside options are worse. As a consequence of displacement, however, individuals with an average lower entrepreneurial ability might select into self-employment, since a lower reservation wage implies that lower entrepreneurial ability is sufficient for self-employment to yield the highest utility. This mechanism possibly counteracts the positive effect on survival. The effects of displacement on survival are hence expected to go both via a direct effect of worse outside options but also via an indirect effect, stemming from a different selection into self-employment.

To identify the effect of displacement on survival, propensity score matching is incorporated in order to create a matched sample of displaced and non-displaced individuals. Then, a duration analysis is conducted on those individuals from the matched sample who select into self-employment. A discrete-time proportional hazard model indicates that the survival of the business is increased as a consequence of displacement. However, the effect is heterogenous with respect to whether the individuals leave self-employment for unemployment, employment or inactivity.[3] The results indicate that displacement decreases the probability of leaving self-employment for employment and that the probability of leaving self-employment for unemployment and inactivity is unaffected. The effect on exits to inactivity is very uncertain, however.

The data used in the paper contain all individuals in Sweden who have been displaced due to plant closures or downsizing during 1987 and 1988 (271,873 individuals). In addition, it includes a control group consisting of 200,000 individuals who are employed in 1986. The information in the data is extensive. It includes individual and family background, labor market history as well as regional characteristics for each individual at least three years prior to and eleven years after potential displacement. The large sample size and the rich information make it possible to use a matched sample, which implies that I can control for selection into displacement without controlling for selection into

[3] Inactivity refers to the individual having left the labor force.

self-employment (selection into self-employment is part of what I want to capture). A further advantage of the data is the long follow-up period.

The rest of the paper is organized as follows. In Section 2, related literature and a theoretical framework are briefly discussed. Section 3 presents the empirical strategy and the data are described in Section 4. The empirical analysis is found in Section 5 and Section 6 concludes the paper.

2 Related literature and a theoretical framework

In previous literature, displacement is typically found to persistently decrease the wage in future employment (Hamermesh, 1987; Edin, 1988; Jacobson et al., 1993; Huff Stevens, 1997; Eliason, 2005; Huttunen et al., 2006). For instance, Eliason (2005), who uses the same data set as this paper, finds that the income for married employed men decreases by 5 percent immediately after displacement, that earning losses are the largest (11 percent) after 6 years and that earning losses are as large as 7.5 percent even after 11 years. A commonly raised explanation for the earning losses is the loss of firm-specific human capital. Other suggested explanations for earning losses are the loss of particularly good matches between individuals' human capital and the firm, the existence of wage premiums and the acceptance of lower present wages in return for higher earnings later in the same employment. Displaced individuals have also been found to have longer and more frequent spells of unemployment, both in the short and the long run (Huff Stevens, 1997; Eliason and Storrie, 2006). Both unemployment and decreased wage in employment imply a lower reservation wage of self-employment. Displacement may also have non-pecuniary effects decreasing the reservation wage for self-employment. For instance, Shapero (1975) argues that displacement creates bitterness and insulted feelings, which increases the preferences for being one's own boss.

In an occupational choice framework, a decreased reservation wage of self-employment implies an increased probability of entry. Evidence consistent with this mechanism is provided in Nykvist (2008) which finds that displacement almost doubles the probability of self-employment entry. Hence, more individuals seem to select into self-employment due to displacement. The next question is then, what are the consequences for survival? As modeled by, for instance, Jovanovic (1994), the entry decision depends on expected entrepreneurial ability and the pay-off (and hence survival) in self-employment is determined by realized entrepreneurial ability.[4] This implies that if displaced and non-displaced have similar expectations, the displaced will on average have a lower entrepreneurial ability and will thus fail to a larger extent. Hence, as an indirect effect of displacement, which works via selection into self-employment, the failure rate is expected to be higher among the displaced. An expected counteracting effect on self-employment survival stems from the presumed persistency in the decrease in labor income and increased preferences for self-employment following displacement; self-employment is to a larger extent the best occupational choice for the displaced, not

[4] Entrepreneurial ability can be considered as the ability to run a business and find profitable business opportunities which, as suggested by Casson (2003), might reflect judgement.

only when entering self-employment, but also when the choice is revised as time elapses, everything else equal.

The literature on self-employment survival is, in general, sparse.[5] Most closely related, Carrasco (1999) and Johansson (2000) find that being unemployed before entry into self-employment increases the exit rate to unemployment, which they explain by a lower entrepreneurial ability due to a lower reservation wage for job-less individuals. While there is no effect of being job-less on the exit rate to employment according to Johansson (2000), Carrasco (1999) finds a positive effect also in this respect. Taylor (1999) studies the same issue from the employment side and, consistently with Carrasco (1999), finds that individuals who have left employment for self-employment (i.e. quit their jobs before entry) survive longer as self-employed, independently of exit state. While these studies provide a descriptive analysis of the differences in self-employment survival between previously unemployed and employed individuals, this paper will capture the causal effects on survival as an entrepreneur of having lost the previous job in connection with self-employment entry.

3 Empirical strategy

There are two potential selection processes of importance for the analysis, selection into displacement and selection into self-employment. While I want to capture the latter to apprehend differences in entrepreneurial ability, the first needs to be random to enable identification. To make identification possible, a two step procedure is applied. In the first step, I create a matched sample of displaced and non-displaced individuals and then, in the second step, I perform a duration analysis on those who select into self-employment from this matched sample.[6] The identifying assumption is that displacement is randomly assigned in the matched sample.

The matched sample is constructed using the propensity score, as proposed by Rosenbaum and Rubin (1985). The probability of displacement (the propensity score) is estimated using a logit model on all displaced and non-displaced individuals (see Section 4.3 for a description of the estimation of the propensity score). The goal is to create a propensity score such that displacement is independently assigned conditional on the propensity score (the conditional independence assumption).[7] If conditional independence is achieved, the non-displaced individual with an identical propensity score represents the counterfactual of the displaced and the effect of displacement can hence be identified. All variables jointly affecting survival and probability of displacement should be included in the propensity score for the assumption to be fulfilled. For each displaced

[5] For a recent review of the literature on self-employment survival, see Georgellis et al. (2005).

[6] For a similar approach using a discrete time proportional hazard model on a matched sample, see Hujer et al. (1998).

[7] As shown by Rosenbaum and Rubin (1983), assuming that outcome is independent of treatment assignment conditional on the propensity score ($Y(0),Y(1) \perp D|p(X)$) is equivalent to assuming that outcome is independent of treatment assignment conditional on the controls ($Y(0),Y(1) \perp D|X$).

individual, the non-displaced individual with the closest propensity score is then assigned and all pairs together constitute the matched sample.

From the matched sample, those selecting into self-employment in the year of potential displacement are picked out and a duration analysis is then carried out on this sub-sample. As compared to studying the individuals selecting into displacement the year after displacement, using the year of displacement maximizes the follow-up period and avoids selection of displaced individuals who enter reluctantly due to the lack of other options. Choosing the longest possible follow-up period is especially important considering that some uncertainty enters in the middle of the period due to lacking information in the data (this problem will be discussed in detail in Section 4.1). Using the year of potential displacement also ensures that the control group really consists of employed individuals. Since I cannot observe when in the year the exit occurred, self-employment entry can occur both before and after actual displacement. Based on the fact that prior displacements are arguably known at least in the same year as that in which the individuals will lose their jobs, entries both before and after can be regarded as effects of displacement. Since all individuals in the sample enter self-employment, flow sampling is employed which implies that left censoring is not an issue.

In the second step, entrepreneurial survival is estimated using the discrete-time proportional hazard model developed in Prentice and Gloeckler (1978) which uses a complementary log-log specification to model the hazard function. A discrete model is used since the data do not allow identifying at what point in time during the year the exit occurred. The discrete-time hazard is the probability of failure in $[t_{a-1}, t_a)$ divided by the probability of surviving until at least t_{a-1}. The model is the discrete representation of the proportional hazard model and resembles the Cox proportional hazard model in the sense that it does not make any assumptions about the baseline hazard. The estimates have the same interpretation as in continuous time; for small changes in the covariates, the coefficients are good approximations of the percentage effect on the hazard and for dummy variables, the percentage effect on the hazard is $100(e^{\beta}-1)$. The shape of the baseline hazard is non-parametrically estimated by including dummy variables for each duration interval.

All exits are not failures and the mechanisms behind the exit may differ considerably. To make a closer identification of the effects of displacement possible, exit states defined as employment status after self-employment exit are used. The exit states employment, unemployment and inactivity are considered. Based on assumed worse outside options following displacement, the hazard rate should be decreased by displacement when considering the employment exit state. However, since exits to employment may reflect both voluntary and involuntary exits, a positive effect is also possible and in line with the theoretical framework (based on the selection of less able individuals). Since exiting to unemployment is arguably almost exclusively involuntary, displacement is expected to increase the hazard rate when instead considering this exit state. The interpretation of the exit state inactivity is less clear, which I will return to later. By assuming the competing risks to be independent of each other, single-risk methods can be separately applied to each exit state. In each of the competing risk models, the options are hence either to continue (right censored) or to exit into the exit state in question.

4 Data and descriptive analysis

The data are longitudinal and follow displaced and non-displaced individuals during the years 1983-1999. The information in the data is extensive. At the individual level, the data set covers information on basic demographics, family, education, material welfare, labor market, region, work and health. It also consists of aggregated regional labor market information. The data include all individuals in Sweden who were displaced due to plant closures or downsizing in 1987 or 1988 (271,873 individuals). In addition, a random sample of 200,000 individuals employed in an establishment that is not closing or downsizing in November 1986 are included.[8]

The sample is restricted to include non-self-employed individuals aged 25 to 55 (the year before potential displacement) in order to exclude individuals close to retirement and those close to or still in secondary or tertiary education. The sample further excludes individuals in the construction industry and individuals with missing information concerning industry. The former restriction is implemented since in the construction industry, establishments are mobile and connected to building sites implying that it is difficult to accurately define establishments and hence, displacements. The latter restriction is implemented to avoid selection issues, which may arise since only the non-displaced have missing information on industry (the displaced without information concerning the establishment are not identified).[9]

4.1 Self-employment and exit states

A self-employed is defined as an individual who has reported to the tax authority that she has received income as a sole proprietor or from a trading partnership and that she carries the business and works at least 33 percent out of full time in it (i.e. the individual is regarded as an active owner by the Swedish tax authority). Exit from self-employment is identified by the disappearance of the business income, where the year of exit is the last year in which the individual receives business income. As previously indicated, the self-employed are divided into the exit states employment, unemployment and inactivity. Unemployed are defined as individuals who have received unemployment benefits in the

[8] The register based Labor Market Statistics (RAMS) were used to identify the displaced workers and the control group. RAMS also contains register based information about the individuals. Further information about individual characteristics was collected from the Income and Wealth register (IoF) for the years 1983-1989 and the corresponding information for the years 1990-1999 was collected from the Longitudinal Database of Education, Income and Employment (LOUISE). Classification of the municipalities based on structural characteristics was obtained from the Swedish Association of Local Authorities and Regions (The latest available classification was used which is strictly valid for 1988 to 1992. There should be no large differences compared to a potential classification for the years used in this study, that is 1985 to 1987). Regional unemployment data is based on registered unemployment from the local labor market authorities.

[9] The attrition is 4.3 percent for the sample period. In addition to the attrition, some individuals have missing values for some intermediate periods. These individuals are also excluded and correspond to an additional 0.5 percent.

year of exit;[10] employed are defined as individuals who have received labor income and not unemployment benefits in the year of exit; and inactive individuals have neither received unemployment benefits nor labor income.

A shortcoming of the data is that owners of limited companies or individuals who are passive sole proprietors or passive owners of trading partnership cannot be identified. This implies that these business owners are excluded and that I cannot capture changes in legal organizational form or degree of activity. While disregarding the passive business owners and defining passive ownership as exit is rational and in line with previous research (see, for instance, Bates (1990)), the owners of limited companies should not be excluded and incorporating the business should not be regarded as exit. Fortunately, the exclusion is not very large since the large majority of new businesses in Sweden have the legal organizational form of sole proprietor or trading partnerships. Those individuals who change this legal organizational form to a limited company will be captured in the inactivity or employment category. All business incorporations before 1990 will be captured in the inactivity exit state. After the 1990-tax reform, the imposed income-splitting rules imply that to which of the states they are designated depends on whether they receive labor income from their limited company or not. Since businesses of interest for incorporation are likely to exceed the limit for when income must be declared as labor income, a large share will end up in the latter category. The exit states employment and inactivity will hence not only capture exits but also incorporations. However, it is reasonable to believe that potential differences in the probability of incorporating between displaced and non-displaced individuals will not drive the results, since only a small share of the sole proprietors and trading partnerships incorporate.[11]

A related complicating issue is to which exit state individuals who sell a successful business are designated. Since these individuals may receive unemployment benefits after an extended qualifying period, they may end up in all exit states. This problem is particularly unfortunate since it implies that exits to unemployment cannot exclusively be regarded as failures. If, for some reason, the non-displaced exploit unemployment benefits after selling a successful business to a larger extent than the displaced, the effect of displacement from the assumed lower entrepreneurial ability is counteracted. Another problem associated with the definition of the exit state is that individuals who leave the business in December may falsely be designated to the inactivity exit state since these individuals may not receive the first wage or unemployment benefits until the subsequent year. The problem should be more prevalent among those who enter employment, since unemployment benefits are received with only, at most, a six-day qualifying period.[12] It is also important to note that for exits in the first duration interval (individuals who enter and exit in the same year), the exit state could equally well be labor status before entry. By the definition of the control group, it is impossible for the non-displaced to be

[10] All business owners are entitled to unemployment benefits from a basic insurance scheme, at the time handled by KAS.

[11] While 22 percent of the newly established businesses in 1999 were corporations, 27 percent of the existing businesses were corporations (based on data from the Swedish Institute for Growth Policy Studies (ITPS) and Statistics Sweden).

[12] Between 1989 and 1993 there was no qualifying period.

regarded as entering inactivity in the first year. Due to this drawback, the effect of displacement in the first duration interval is separated from the total in some parts of the analysis. In the robustness analysis, unemployment benefits and labor incomes are, furthermore, measured in the year after exit. While this definition does not imply any problems in correctly designating those leaving in December or that the entry status rather than the exit status is measured, it may actually not capture the exit state since the employment status may have changed.

Self-employment in 1990

A problem with the data is the lack of information on business income in 1990. This is due to the fact that up until 1990, RAMS contains the business income for the year of declaration instead of the year of income (implying that business income refers to business income in the prior year) but then refers to the year of income. To make a duration analysis covering both the period before and after 1990 possible, some kind of imputation of whether the individual is self-employed in 1990 is necessary. In the main part of the paper, the self-employment status in 1990 is estimated using conditional probabilities exploiting the fact that the displaced have different years of entry and hence, 1990 occurs in different duration intervals. The probability of exit in a certain duration interval is calculated for the displaced (with information), separately for sub-sequent self-employed and non-self-employed. Those displaced individuals lacking information in the duration interval in question are then randomly assigned a self-employment status with the probability calculated in the previous step and conditional on the self-employment status in the following period. The method is straightforward for the displaced and should yield good approximations at the macro level if the displaced do not differ significantly among each other. For the non-displaced, it might be less obvious to use the probability of self-employment for the displaced, but it is inevitable since all non-displaced lack information on exits in duration interval 4 (the self-employment status is missing in period 5). The approach is expected to decrease the difference between the displaced and the non-displaced. Since exits in one duration interval affect all subsequent exits (since the individual can only exit once), all duration intervals following 1990 might also be affected. It is also important to note that, due to an insufficient number of observations, no consideration in terms of exit states is taken when calculating the conditional probabilities. This implies that although the share of observations of exits in 1990 will be correct, it might give misleading results when considering the exit states. Due to these concerns, the effects of displacement will be studied separately in each duration interval in predicted-hazard-graphs after the baseline regressions. Two other approaches are used in the robustness section to give self-employment status to those lacking information. In the first case, all individuals attain the same status as in the following year (1991) and in the second case, all individuals attain the self-employment status in the prior year (1989). The first case implies that no firm deaths occur in 1991 while in the second case, no firm deaths occur in 1989.

4.2 Identifying the displaced

The displaced in the paper include individuals displaced both due to plant closure and downsizing. Plant closure is the cleanest measure of displacement since selection on personal characteristics is minimized. Downsizing is included in the definition to extend the sample size, which is crucial for the use of a matched sample.

Let me start with the definition of individuals displaced due to plant closures. A closed establishment is first identified by the disappearance of its identity number from the compulsory annual payroll tax returns. All closures affecting at least ten employees were identified.[13] Excluding small plants implies that selection stemming from the fact that less able employees might increase the probability of failure and hence, closure, should be negligible. On the other hand, if individuals employed in small plants to a larger extent obtain entrepreneurial knowledge from their employer than individuals in large plants, the exclusion of small plants implies that the effect of displacement on hazard might be positively biased.

The longitudinal features of the data make it possible to define closure as a process over time and hence, to define displaced workers as those separating from the establishment within a certain time-window preceding the closure. If individuals who leave early differ from those who stay until the end, this is important since omitting the early leavers would bias the results.[14] A disadvantage with the wider time window, pointed out by Kuhn (2002), is the risk of including normal workforce turnover. Eliason (2005) minimizes this risk by first setting an upper limit equal to three calendar years for the closure process and then, after careful inspection of each process, a probable duration of the process is defined to be one, two or three years, based on worker flows and establishment size.[15] In this paper, the same definition of displaced workers is used as in Eliason (2005), that is, all separations that occurred within the time-window of the closure process determined for the particular establishment.[16]

Individuals are defined as displaced due to downsizing if separating from a plant (in 1987 or 1988) where the labor force is reduced by at least 20 percent during the year. A potential concern when using this definition is that the exits might not refer to displacements but rather to voluntary quits. This concern is more serious when considering downsizing, as compared to plant closures, since there is no information on whether the firm actually displaces employees. 20 percent of the work force may leave a plant during the same year without its having anything to do with downsizing. This is

[13] These establishments were surveyed by Statistics Sweden to ensure that the disappearance of the identity number was actually due to closure. This procedure mitigates the problem of identifying "false firm deaths" discussed by Kuhn (2002).

[14] Previous studies on displacement have in general neglected the fact that closure is a process over time. Two exceptions that use a wider time-window including early leavers are Hamermesh and Pfann (2001) and Huttunen et al. (2006).

[15] For a closer description, see Appendix A.

[16] Since RAMS is only available from the year 1985, workers displaced three years prior to closures in 1987 are not identified in the data.

especially true in smaller plants. Moreover, even if they are downsizing, the risk is larger that some individuals might quit voluntary if the plant is only downsizing and not closing down. A further concern is that the firm might select whom to displace based on productivity or other unobservable characteristics. Considering the restrictive seniority rules applied in Sweden, this selection should not be too severe, however. Due to the concerns associated with the definition of displaced due to downsizing, robustness checks using individuals displaced due to plant closures and downsizing separately are carried out.

4.3 Control variables and creating a matched sample

All time-variant variables at the micro level included in the estimation of the propensity score are measured three years prior to potential displacement (see Table 1) to minimize the risk of the pre-displacement information being affected by the impending displacement. Since the number of displaced is larger than the number of non-displaced, the non-displaced are allowed to be used as matches several times (i.e. matching with replacement). Using replacement also minimizes a potential bias. A concern in our particular case associated with using matching with replacement is that the weight on some individuals might become large and create a large variance in the duration analysis. Only the nearest neighbor is used in order to achieve the smallest possible bias. In general, using only one neighbor as compared to oversampling reduces the bias but also reduces the efficiency. Abadie and Imbens (2006) establish that in the case of a fixed number of neighbors and matching with replacement, the potential gains in terms of variance associated with using multiple neighbors are negligible as compared to the losses in terms of bias. Nevertheless, five neighbors will be used as robustness. Finally, to restrict the sample to only contain individuals within the common support, only those treated for which the closest match is within one percent of the propensity score are considered.

In an attempt at creating a propensity score fulfilling the conditional independence assumption, interactions and polynomials of the covariates in Table 1 are included in the propensity score until there are no significant differences (at the 1 percent level) in the covariate means between the displaced and non-displaced in the matched sample. The standardized bias in the matched sample is reduced from 6.11 to 0.379.[17] Due to the common support restriction, one treated individual is disregarded. This small loss implies that the common support is close to complete and hence, that the effects can be generalized to all displaced individuals. To further evaluate the balance of the propensity score, the approach of Dehejia and Wahba (1999), (2002) is applied. This approach involves studying the equality of the means for the treated and untreated for different deciles of the propensity score. For the final propensity score, the balance in each decile of the propensity score is above 75 percent in all 8 middle deciles.

In Table 1, the means and standard errors for the pre-displacement variables, used to estimate the propensity score, are presented for non-displaced and displaced individuals. For the non-displaced, the means in both the unmatched and matched sample are

[17] The standardized bias is calculated as $D=(x\text{-}tak_D\text{-}x\text{-}tak_C)/\sqrt{((s_D^2+s_S^2))}$.

presented. The matched sample now refers to those individuals from the whole matched sample who have selected into self-employment.

It is clear from Table 1 that in most cases, the differences between the displaced and non-displaced are smaller when considering the means in the matched sample, as compared to the unmatched sample. However, there are clear differences between the displaced and non-displaced also for the matched sample. Since there are no differences in the covariate means in the whole matched sample, this suggests that differences between the displaced and non-displaced exist both due to pre-displacement differences and due to the selection into self-employment.

In addition to the dummy variable indicating displacement, all duration analysis regressions will include the local unemployment rate and local average aggregated income as time-varying variables to control for environmental conditions.[18] In addition, one specification will include the year of entry. The intention with this inclusion is to control for macro effects potentially not controlled for by the local unemployment rate and average aggregated income, but since only the displaced enter in different years (all non-displaced entered in 1987), the dummy variables for the year of entry might be driven by differences between early and late leavers among the displaced. Since only individuals displaced due to downsizing enter in 1987, the dummy variables might furthermore reflect differences between displaced due to plant closures and downsizing, respectively.

Table 1: Descriptive Statics of the Displaced and Non-displaced workers

	Mean/Percentage share		
Pre-displacement variables	Non-displaced, Unmatched sample	Non-displaced, Matched sample[1]	Displaced
Basic Demographics and family (t-1)			
Age	39.01 (.2291)	38.56 (.1937)	37.17 (.1537)
Female (d)	.3651 (.0142)	.3478 (.0117)	.3435 (.0093)
Born in an other Nordic country (d)	.0297 (.0050)	.0338 (.0044)	.0443 (.0040)
Born in a Non-nordic country (d)	.0402 (.0058)	.0501 (.0054)	.0753 (.0052)
Children (d)	.5886 (.0145)	.5302 (.0123)	.5296 (.0098)
Married (d)	.6131 (.0144)	.5664 (.0122)	.5441 (.0097)
Education (t-1)			
High school (d)	.3755 (.0143)	.4028 (.0121)	.4077 (.0096)
College (d)	.3179 (.0138)	.3357 (.0116)	.2747 (.0087)
Graduate studies (d)	.0341 (.0054)	.0296 (.0042)	.0175 (.0025)
Material welfare and labor market (t-3)			
Labor income (SEK 100)	840.4 (16.20)	891.4 (15.60)	872.7 (11.37)
Unemployed (d)	.0471 (.0063)	.0622 (.0059)	.0726 (.0051)
Received social allowance (d)	.0122 (.0032)	.0157 (.0031)	.0519 (.0043)
Self-employed[2] (d)	.2000 (.0118)	.2566 (.0107)	.1257 (.0064)
Amount of taxable wealth (SEK 1000)	888.9 (45.22)	904.0 (37.35)	603.7 (33.81)
Residential municipality (t-1)			

Continued on next page

[18] The environmental controls refer to the conditions (over time) in the residential municipality the year of entry. The individuals are thus assumed not to move.

Table 1: *continued*

Pre-displacement variables	Mean/Percentage share Non-displaced, Unmatched sample	 Non-displaced, Matched sample[1]	 Displaced
Metropolitan (d)	.1362 (.0101)	.1963 (.0098)	.2358 (.0083)
Suburban (d)	.1249 (.0098)	.1522 (.0088)	.1643 (.0072)
Large sized city (d)	.2550 (.0129)	.2120 (.0100)	.2346 (.0083)
Medium sized city (d)	.1345 (.0101)	.1075 (.0076)	.1058 (.0060)
Industrial (d)	.0114 (.0031)	.0133 (.0028)	.0076 (.0017)
Sparsely populated (d)	.0638 (.0072)	.0760 (.0065)	.04356 (.0040)
Countryside (d)	.0664 (.0074)	.0652 (.0061)	.0405 (.0039)
Normal municipality (d)	.2105 (.0120)	.1775 (.0094)	.1708 (.0074)
Industry employed in (t-1)			
Agriculture, forestry, hunting, fishing (d)	.0594 (.0070)	.0839 (.0068)	.0325 (.0035)
Mining (d)	.0087 (.0028)	.0036 (.0015)	.0046 (.0013)
Manufacturing (d)	.2000 (.0119)	.1957 (.0098)	.2220 (.0081)
Electricity, gas, heating, water supply (d)	.0122 (.0032)	.0066 (.0020)	.0053 (.0014)
Trade, restaurants, hotels (d)	.1022 (.0090)	.1202 (.0080)	.1685 (.0073)
Communication (d)	.0690 (.0075)	.0725 (.0064)	.0814 (.0053)
Financial institutions, insurance, real estate, business services (d)	.0690 (.0075)	.0912 (.0071)	.1196 (.0063)
Public administration, other services (d)	.4794 (.0148)	.4263 (.0122)	.3660 (.0094)
Number of observations	1145	1656	2617

NOTE: Industry employed in according to the Swedish Industrial Classification, SNI69-code. Dummy variables are indicated by (d). [1]The matched sample consist of those who enters self-employment the year after potential displacement from the whole matched sample. [2]Due to problems in data, self-employment status refers to *(t-4)* instead of *(t-3)* for displaced in 1988. Standard errors in parantheses.

4.4 Life table estimates

In this section, life table estimates are presented for displaced and non-displaced. In Table 2, Kaplan-Meier survivor function estimates are presented together with the number of observations, right censored observations and firm deaths in each duration interval.

As can be seen in Table 2, survival clearly differs between the displaced and non-displaced while the differences are negligible between the unmatched and matched sample of non-displaced. According to a log-ratio test of the equality of the survivor functions, the displaced and non-displaced differ for both the matched and non-matched sample, while there is no difference between the non-displaced in the matched and non-matched sample. A substantially larger share of the firms survive the first year for displaced individuals compared to the non-displaced and only 3 to 4 percent of the firms survive eleven years for the non-displaced as compared to 8 percent for the displaced. The number of survivors decreases dramatically in the first years and then the decline diminishes.

Table 2: Kaplan-Meier Survivor Function Estimates in percent, the number of deaths in parenthesis

	Duration in years											N/
	1	2	3	4	5	6	7	8	9	10	11	lost
Non-displ.,	49	30	22	15	10	8	6	5	4	4	4	1145/
unmatched	(583)	(213)	(102)	(80)*	(58)	(23)	(14)	(12)	(10)	(4)	(3)	43
Non-displ.,	48	29	22	15	8	7	5	4	4	3	3	1656/
matched	(867)	(303)	(116)	(119)*	(111)	(30)	(24)	(20)	(5)	(4)	(0)	57
Displaced	60	42	28	22	18	15	13	11	10	9	8	2617/
	(1046)	(483)*	(340)*	(172)*	(111)	(80)	(58)	(36)	(32)	(26)	(11)	222

NOTE: The unmatched sample consists of all individuals who enters self-employment the year of potential displacement and the matched sample refers to those who enters self-employment from the matched sample. *Indicates that the deaths are approximated. Please note that all figures also after these duration intervals are, as a consequence, only approximative.

As described in Section 4.1, the exits in duration intervals 2, 3 and 4 are partly estimated for the displaced. For the non-displaced, all exits in duration interval 4 are estimated. This implies that the largest uncertainty is in duration interval 4, where both non-displaced and displaced have estimated exits and the largest share of the estimated exits occur. As previously indicated, however, also exits after these intervals are affected if the "wrong" individuals exit.

5 Empirical results

5.1 Baseline results

In this section, the effect of displacement on self-employment survival will be estimated using a discrete-time proportional hazard model on the matched sample (see Section 3 for a description of the empirical method). Both a single risk and a competing risks framework are considered. Specifications with and without the year of entry are used. The results are presented in Table 3.

For the single risk model, the result suggests that the risk of exiting is decreased as a consequence of displacement. The effect of displacement crucially depends on the exit state, however. While the risk of exiting to employment is significantly decreased, the risk of exiting to unemployment or inactivity is increased, although insignificantly in most of the cases. The effect of the local unemployment rate is as expected. Increased unemployment in the residential municipality implies an increased risk of exiting to unemployment and a decreased risk of exiting to employment. The local aggregated average income decreases the risk of exit to both unemployment and employment, but is significantly stronger when considering exits to unemployment. For the exit state inactivity, both the local average income and the local unemployment rate are insignificant, which may reflect the potentially large diversity in this exit state. The estimated coefficients for the year of entry indicate that the later the firm is started, the larger is the risk of exiting to employment and the smaller is the risk of exiting to

Table 3: Estimated discrete-time proportional hazard coefficients: Matched sample using the nearest neighbor.

	Single risk:		*Competing risks:*					
			Exit to employment		Exit to unemployment		Exit to inactivity	
Displaced	-.252***	-.689***	-.245***	-.92***	.100	.048	.392**	.761
	(.037)	(.225)	(.04)	(.305)	(.16)	(.505)	(.154)	(.469)
Local unempl.	-.594	-.787	-2.618**	-2.863**	12.055***	12.38***	-2.676	-2.548
	(1.086)	(1.101)	(1.23)	(1.245)	(3.407)	(3.454)	(3.215)	(3.417)
Localincome	-.0004***	-.0004***	-.0004***	-.0005***	-.002***	-.002***	.0001	.0002
	(.0001)	(.0001)	(.0001)	(.0002)	(.0006)	(.0006)	(.0003)	(.0003)
Enters 1987		.434*		.671**		.089		-.378
		(.226)		(.306)		(.503)		(.458)
Enters 1988		.463**		.707**		-.015		-.375
		(.227)		(.307)		(.513)		(.464)
Sample size	4,273	4,273	3,619	3,619	527	527	685	685
Log-likelihood	-7397.8	-7395.4	-5983.6	-5980.3	-697.1	-696.9	-1303.3	-1303.0

NOTE: The sample consists of those individuals who have selected into self-employment from the matched sample. Displaced indicate displacement the year of entry. Local unempl. is the unemployment rate in the residential municiplaity the year of entry and local income is the average of the aggregated income in the residential municipality the year of entry. Duration interval dummy variables are included to account for duration dependence.

unemployment (considering the significant effects). Based on the heavily weakening economic trend in 1990, the opposite result was expected. The result may instead be driven by selection among the displaced, as discussed in Section 4.3. The displaced in 1986, who are all displaced due to plant closure and have left the firm early (one or two years prior to closure), seem to have worse outside options and lower entrepreneurial ability as compared to the other displaced. Due to the fact that the result indicates that the year of entry mainly reflects differences between the displaced and not, as intended, different effects of the bust in 1990, and since I am only interested in capturing an average effect for all displaced, in the rest of the paper I will entirely focus on the specifications without the year of entry. Thus, I rely on the fact that the local unemployment rate and average income will capture differences in economic environment. Using the year of entry would, in these circumstances, be inconsistent since the propensity score is estimated for all displaced and not separately estimated for the displaced in the different years.

I will now return to the effects of displacement and analyze these in more detail. For the exit state employment, the risk of exiting is decreased by approximately 22 percent ($100(e^{-.245}-1)$) as a consequence of displacement (according to the specification excluding the year of entry). The longer survival is expected based on displacement implying worse outside options. Due to the inability to identify owners of corporations, the result may also reflect the fact that non-displaced incorporate to a larger extent. Based on the assumed lower entrepreneurial ability among the displaced, this may indeed be the case since arguably the most successful businesses incorporate. As previously argued, however, the number of business incorporations is small, which implies that the above result plausibly mainly reflects worse outside options. The result indicates that the

displaced view self-employment as their new means of subsistence, rather than as a transitory state between employments, which can be interpreted as self-employment being a means of getting away from paid employment rather than back to employment. For the exit state unemployment, a positive sign is expected based on the introductory theoretical reasoning. Displacement was argued to imply an average lower entrepreneurial ability among those who select into self-employment, which should imply a higher failure rate. The magnitude of the effect is small and insignificant, however, and the evidence in favor of this reasoning is hence weak. As previously indicated, the exit state may contain exits due to sales of profitable businesses. That differences between displaced and non-displaced in the propensity to exploit unemployment benefits after selling a profitable business would affect the result (and counteract a potential effect from lower entrepreneurial ability) indeed seems unreasonable, however.

Displacement significantly increases the hazard rate into inactivity for the specification excluding the year of entry. An interpretation in line with the assumed lower entrepreneurial ability and the worse outside options is that the displaced fail to a larger extent and leave the labor force due to worse outside options. Those who enter self-employment and then leave self-employment for inactivity among the displaced may be individuals determined to not once more fall under the control of others but who lack sufficient entrepreneurial ability to remain in self-employment. As previously described, however, the inactivity exit state may also contain incorporations and sales of profitable companies. If the displaced are more determined and focused (more full-time self-employment)[19] on being self-employed, it is reasonable to believe that they will incorporate the business to a larger extent, since incorporations are commonly associated with expansion. Based on the worse outside options, it is also plausible that after selling a profitable business, the displaced leave the labor force to a larger extent than the non-displaced. The latter two explanations give an intuition for a positive effect on the hazard rate without any connection to entrepreneurial ability.

As previously discussed, the exit state for the first duration interval may not be the exit state but rather the entry state and for the non-displaced, exits to inactivity are, by definition, impossible. When separating the effect of displacement in the first year from the total effect (an interaction between displaced and the first duration interval dummy variable is included), the signs are still the same but now the effect is insignificant, not only in the unemployment exit state but also for the other two exit states. For the exit state employment, the magnitude of the effect is heavily decreased to 0.07. That the first duration interval drives the result is not surprising based on the fact that it is reasonable to believe that potential differences are largest before those less suited or motivated to be self-employed are sorted out, but is worrying considering the problems in knowing whether the exit states really indicate the labor status after exit. However, it seems implausible that a larger share of the displaced, as compared to the non-displaced, who leave self-employment after the first year receives labor income and not unemployment benefits before entry and that this difference would drive the result. If anything, the opposite would be expected and hence decrease the estimated effect. Furthermore, it should be kept in mind that the single risk model also indicates a negative effect on the

[19] The year after entry, 70 percent of the displaced are part-time self-employed and 94 percent of the non-displaced are part-time self-employed (i.e. they have labor income in addition to business income).

hazard, which indicates that displaced do survive longer (this effect is also insignificant if excluding the first year). The uncertainty only concerns from which exit state this increased survival can be extracted and, based on the results, the only reasonable conclusion is that it originates from the employment exit state. For the inactivity exit state, on the other hand, the result totally eliminates any reliability of the previous results. In the rest of the paper, I will continue to report the results for inactivity but not comment on them due to this result and the difficulties in finding a meaningful interpretation. As a final remark, it is evident from studying the sample sizes in the different exit states that the large majority of all exits end since the individual enters employment. This finding is consistent with the result of Taylor (1999).

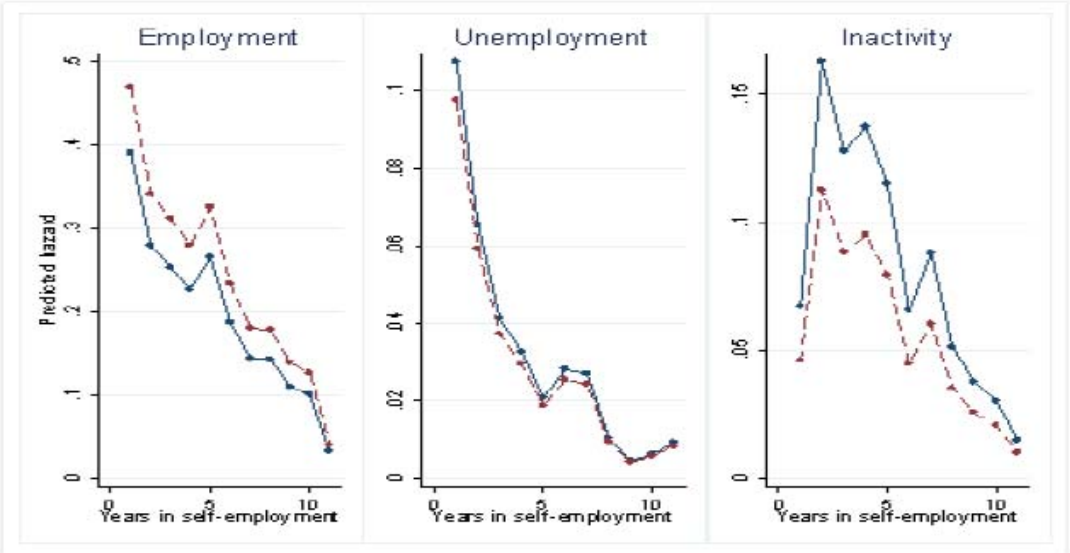

Figure 1: Predicted hazard of exits from self-employment to employment, unemployment and inactivity for displaced (solid line) and non-displaced (dashed line).

Figure 1 illustrates the expected hazard for the specifications excluding the year of entry. The first impression from the figure is that there is a clear negative duration dependence; that is, the risk of exit is decreasing the longer is the period in which the individual has been self-employed. The result of negative duration dependence is consistent with previous empirical evidence (see, for instance, Evans and Leighton (1989); Taylor (1999); Carrasco (1999)). The risk of exiting to unemployment seems to be exponentially decreasing with the years in self-employment. Between the first and fourth year, the risk of exit decreases drastically from roughly 10 to 3 percent. There is less variation in the risk of exiting self-employment for employment but the risk still decreases substantially between the first and eleventh year. Except for the peak in self-employment in the fifth year, the risk of exiting to employment is continuously decreasing.

Figure 2 provides the predicted hazard using different baseline hazards for the displaced and the non-displaced. This figure is especially informative since it might contribute more information about whether the effects are purely driven by the first duration interval. Different baseline hazards are obtained by including interactions between the duration interval dummy variables and displacement in addition to the

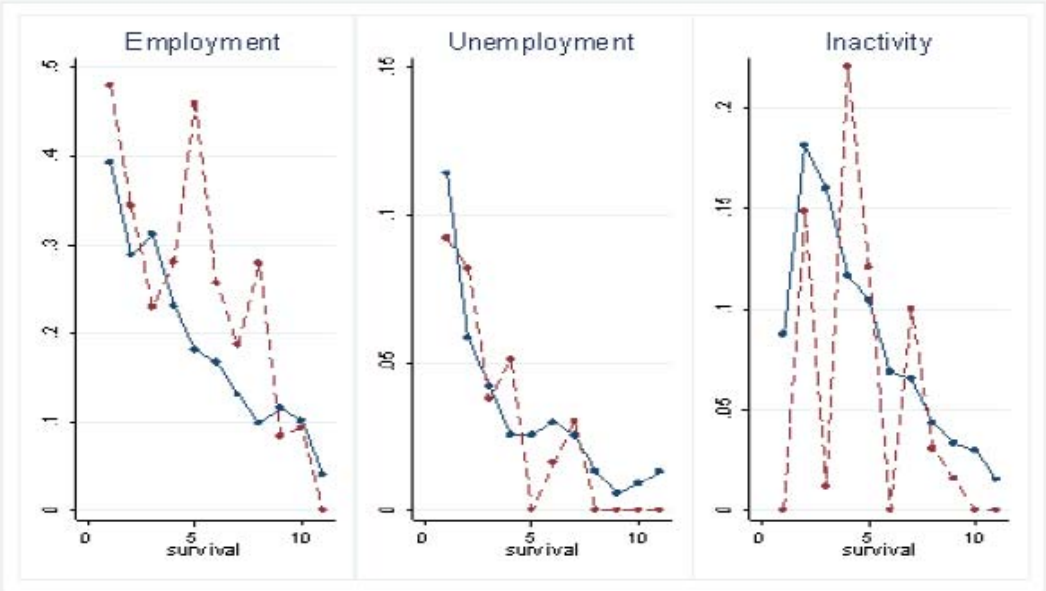

Figure 2: Predicted hazard of exits from self-employment to employment, unemployment and inactivity for displaced (solid line) and non-displaced (dashed line). Separate baseline hazards are estimated for the displaced and non-displaced.

negative duration dependence although the relationship between time and hazard for non-displaced is sometimes shaky. As discussed in Section 4.3, the latter can be explained by the fact that each non-displaced can be used several times in the matched sample and hence, some observations get a large weight. Nevertheless, for exits to employment, the predicted hazard is in most cases smaller for the displaced. The interaction term is significantly negative for the first, second, fifth, sixth, and eighth duration intervals. The only significant interaction term indicating a larger hazard for the displaced is the interaction for the third duration interval. That the hazard is smaller for the displaced in the majority of the time intervals indicates that displaced individuals really do leave self-employment for employment to a smaller extent, not only in the first duration interval. For unemployment, the differences are never significant and there is no clear pattern.

A striking feature of Figure 2 is that there are no non-displaced exits to unemployment in duration interval 5, while a large number of individuals leave for employment. The same pattern could be discerned in the previous figure. This implies that none of the displaced who receive unemployment benefits in 1991 have self-employment income in 1990 but not in 1991. This might be due to the self-employment status not being correctly assigned in 1990 for those without business income in 1991 and hence, some of the non-displaced who should have exited in duration interval 4 instead exit in duration interval 5 (they have received self-employment status 1 instead of 0 in duration interval 4). This highlights the problems which follow from the conditional probabilities not being conditioned on exit states.

5.2 Robustness analysis[20]

In this section, the sensitivity of the baseline result will be studied. I will completely focus on the competing risks framework and the specifications excluding the year of entry. As indicated before, I will also only report but not comment on the results for the exit state inactivity. To start with, I will use the alternative methods for interpolation of the self-employment status in 1990. The result can be seen in Table 4.

Table 4: Estimated discrete-time proportional hazard coefficients: Alternative methods for imputation of self-employment status in 1990.

	Exit to employment		Exit to unemployment		Exit to inactivity	
	Spec. 1991	Spec. 1989	Spec. 1991	Spec. 1989	Spec. 1991	Spec. 1989
Displaced	-.222***	-.3***	.159	.116	.406***	.411**
	(.04)	(.04)	(.16)	(.161)	(.154)	(.167)
Local unempl.	-1.9	-1.593	12.316***	11.646***	-.031	-4.225
	(1.259)	(1.168)	(3.391)	(3.305)	(3.149)	(3.188)
Local income	-.0006***	-.0002**	-.002***	-.002***	-.00002	.0003
	(.0002)	(.0001)	(.0006)	(.0006)	(.0003)	(.0003)
Sample size	3,614	3,670	556	554	715	661
Log-likelihood	-5828.066	-6260.354	-705.157	-724.047	-1328.128	-1220.861

NOTE: The sample consists of those individuals who have selected into self-employment from the matched sample. Displaced indicate displacement the year of entry. Local unempl. is the unemployment rate in the residential municiplaity the year of entry and local income is the average of the aggregated income in the residential municipality the year of entry. Duration interval dummy variables are included to account for duration dependence. Spec. 1991 refers to that the same self-employment status as in 1991 is assigned to 1990 and Spec. 1989 refers to that the same self-employment status as in 1989 is assigned to 1990.

As can be seen, the results are very similar to those in the baseline regression. Once more, the risk of exiting to employment is significantly decreased by displacement, while the risk of exiting to unemployment is insignificant. This result indicates that the estimation of 1990 does not drive the baseline results. The next robustness concerns the employment status in the year following exit, instead of in the year of exit. The result can be seen in Table 5.

Thus, the risk of exiting to employment is decreased by displacement. This result is ensuring based on the inability to know whether the exit state really refers to labor status after exit for the first duration interval. It should convince the still doubting reader about there being no differences in the entry state that drive the effect for the exit state employment. The result also indicates that misspecifications of the exit state for individuals exiting in December do not have any important effect on the results. The effect is still insignificant for the unemployment exit state, but now the sign is negative. It is interesting to note that the risk of exiting to inactivity is now insignificant, which supports the view that the effect of displacement in the baseline regression is spurious.

As a next robustness check, 5 instead of 1 neighbor is used to create the matched sample. Since there are differences in two of the covariate means in the matched sample for the baseline propensity score when considering 5 neighbors, the propensity score is

[20] Empirical results, not presented in the section, are available upon request.

re-estimated. The result using the baseline propensity score is presented for comparability and can be seen together with the new propensity score results in Table 6.[21]

Table 5: Estimated discrete-time proportional hazard coefficients: Exit states defined as labor status the year after exit.

	Exit to employment	Exit to unemployment	Exit to inactivity
Displaced	-.254***	-.024	-.025
	(.04)	(.161)	(.145)
Local unempl.	-1.407	12.622***	.478
	(1.207)	(3.384)	(3.502)
Local income	-.0004***	-.001***	.0004
	(.0001)	(.0005)	(.0004)
Sample size	3,680	532	621
Log-likelihood	-6165.309	-759.064	-1114.465

NOTE: The sample consists of those individuals who have selected into self-employment from the matched sample. Displaced indicate displacement the year of entry. Local unempl. is the unemployment rate in the residential municiplaity the year of entry and local income is the average of the aggregated income in the residential municipality the year of entry. Duration interval dummy variables are included to account for duration dependence.

Table 6: Estimated discrete-time proportional hazard coefficients: Matched sample using the 5 nearest neighbors.

	Exit to employment		Exit to unemployment		Exit to inactivity	
	Baseline p(x)	New p(x)	Baseline p(x)	New p(x)	Baseline p(x)	New p(x)
Displaced	-.131***	-.127***	.204**	.231**	.7***	.617***
	(.029)	(.029)	(.101)	(.103)	(.094)	(.093)
Local unempl.	-3.407***	-2.232***	5.442**	5.211**	-7.043***	-5.36**
	(.764)	(.788)	(2.185)	(2.536)	(2.62)	(2.614)
Local income	-.001***	-.001***	-.003***	-.002***	-.0004*	-.00005
	(.0001)	(.0001)	(.0004)	(.0004)	(.0003)	(.0003)
Sample size	9,707	9,717	1,056	1,062	1,141	1,185
Log-likelihood	-15146.87	-15271.23	-1346.134	-1355.835	-1982.148	-2062.727

NOTE: The sample consists of those individuals who have selected into self-employment from the matched sample. Displaced indicate displacement the year of entry. Local unempl. is the unemployment rate in the residential municiplaity the year of entry and local income is the average of the aggregated income in the residential municipality the year of entry. Duration interval dummy variables are included to account for duration dependence.

In Table 6, the hazard coefficient for displacement is significantly negative for the employment exit state and significantly positive for the unemployment exit state, for both the re-estimated and the baseline propensity score. Hence, the results are in line with the previous ones but the effect in the unemployment exit state is now significant. The size of

[21] There are no differences in covariate means in the re-estimated propensity score. The standardized bias is 0.362 and no observations are off the common support. In the baseline propensity score using 5 neighbors, the standardized bias is .360 and 1 observation is off the common support.

the effect is increased and the standard error decreased. The latter can be explained by the larger sample size. If studying each duration interval separately, however, it appears that the effect is only significantly positive in the sixth duration interval.

When using 5 neighbors, the sample size also allows for dividing the displaced into displaced due to downsizing and plant closure, respectively. Propensity scores are estimated separately for each group of displaced.[22] The results can be seen in Table 7.

Table 7: Estimated discrete-time proportional hazard coefficients: Matched sample using the 5 nearest neighbors for displaced due to downsizing and plant closure separetely.

	Exit to employment		Exit to unemployment		Exit to inactivity	
	Plant closure	Downsizing	Plant closure	Downsizing	Plant closure	Downsizing
Displaced	-.237**	-.106***	-.11	.225**	.614	.785***
	(.116)	(.03)	(.285)	(.113)	(.376)	(.103)
Local unempl.	-11.676***	-3.639***	-8.735	10.971***	-3.74	-5.089*
	(3.41)	(.779)	(8.475)	(2.681)	(9.336)	(2.799)
Local income	-.001***	-.001***	-.002**	-.002***	-.001**	-.00009
	(.0004)	(.0001)	(.001)	(.0005)	(.001)	(.0003)
Sample size	457	2989	78	435	76	610
Log-likelihood	-879.304	-14681.85	-134.084	-1134.133	-133.466	-1776.537

NOTE: The sample consists of those individuals who have selected into self-employment from the matched sample. Displaced indicate displacement the year of entry. Local unempl. is the unemployment rate in the residential municiplaity the year of entry and local income is the average of the aggregated income in the residential municipality the year of entry. Duration interval dummy variables are included to account for duration dependence.

For employment, the effect on the risk of exiting displacement is significantly negative for both groups of displaced. The effect of displacement is, however, much larger for the displaced due to plant closure as compared to downsizing. This result may reflect that the outside options are not as bad for those where the plant is not closed, which is reasonable based on the fact that the business and potential contacts still exist. It may also reflect a larger share of voluntary quits among the displaced due to downsizing, which was discussed as a potential concern in Section 4.2. For unemployment, the effect is non-significantly negative for plant closures and significantly positive for downsizing. Based on the theoretical framework, this should be interpreted as there being a selection of self-employed among those displaced due to downsizing but not among those displaced due to plant closure. It is reasonable to believe that the previous result of a significantly positive effect on the hazard using five neighbors is driven by the displaced due to downsizing. Once more, the effect is only significant in the sixth duration interval.

The unmatched sample is used as a further robustness check. Two specifications are considered, one with all controls in Table 1 included and one with only municipality and industry controls. For employment, the result is indeed similar to the baseline result. The estimated coefficient is -.25 and -.26, with and without personal controls. The result

[22] A Caliper of 0.01 is used in the estimation of the propensity scores. For plant closures, there are no differences in covariate means, the standardized bias is 0.701 and 2 observations are off the common support. The share of balanced covariates is above 86 percent for all middle 8 deciles. For downsizing, there are no differences in covariate means, the standardized bias is 0.370 and no observations are off the common support.

suggests that the effect on survival is robust to which controls are included and how they are included. Including personal controls in the specification using the matched sample does not affect the result either. This is reasonable based on the effect of displacement being assumed to reflect worse outside options, which should be unobservable and not driven by personal controls. It also indicates that worse outside options rather than a smaller propensity to incorporate drive the results, since propensity to incorporate is arguably correlated with personal characteristics. For unemployment, the risk of exiting is insignificantly increased in the matched sample for both specifications. When including personal controls in the matched sample, the effect is insignificantly decreased. The latter result might suggest that due to selection, the displaced fail to a larger extent but after controlling for the selection, there is instead a small negative effect. The negative effect might be explained by higher motivation. However, the effect is obviously small and insignificant. Finally, the Weibull model is used to parametrize the hazard (the logarithm of survival is included instead of a duration interval dummy). In the model, the sign and magnitude of the effects are unaffected as compared to the baseline results.

In sum, the robustness results support the baseline results and suggest that the risk of exiting self-employment for employment is decreased by displacement, while the risk of exiting to unemployment is unaffected. That the risk of exiting to unemployment is larger for the displaced due to downsizing in one duration interval cannot be regarded as evidence of an effect of displacement on exits to unemployment. This is particularly true regarding the uncertainty associated with those displaced due to downsizing, the uncertainty for duration intervals after 1990 and a potentially larger bias when considering 5 instead of 1 neighbor in the matching.

6 Concluding remarks

The results suggest that displacement in connection with entry decreases the hazard and hence, increases the time in self-employment. When considering different exit states, the result robustly indicates that displacement decreases the probability of exiting to employment. The interpretation of the result is that worse outside options imply that displaced individuals remain longer in self-employment. Displaced individuals seem to consider self-employment as their new means of subsistence rather than as a transitory state. Based on the baseline results (Figure 2), roughly four out of ten displaced self-employed leave self-employment during the first year as compared to five out of ten of the non-displaced. This difference is not only statistically significant but also of economic importance. No effect of displacement can be pronounced for exits to unemployment and inactivity. While no conclusions for inactivity can be drawn from this result due to problems in the empirical analysis, the result for the unemployment exit state does suggest that no effect on the risk of exiting to unemployment exists, or, at least, that it is very small. In sum, it is evident that as a consequence of previous displacement, individuals choose to remain longer in self-employment, while no clear evidence of a mechanism pushing the displaced involuntarily out of self-employment is found. The results should be interpreted with some caution based on potential biases, in particular those associated with incorrect specifications of the exit states and the estimation of the

self-employment status in 1990. Although all robustness tests do indicate that the results are not driven by these shortcomings, some discretion is appropriate.

The non-existing effect for the exit state unemployment implies that the paper provides no evidence in favor of displaced individuals failing in self-employment to a larger extent. This result suggests that the increased failure rate for unemployed individuals obtained by Carrasco (1999) and Johansson (2000), reflects selection rather than a lower reservation wage due to being job-less.

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Appendix:

A Definition of the length of the closure process

The exact definition of the length of the closure process is given below. For an establishment closed in year t:

Definition 1

The closing process was three years if

a) the number of employees in t-3 was 50 or more, and

b) there was a reduction of the workforce, between both t-3 and t-2, and between t-2 and t-1, of at least 20 percent.

Definition 2

The closing process was two years if

a) the closing process was not three years according to Definition 1,

b) the number of employees in t-2 was 25 or more,

c) there was a reduction of the workforce, between t-2 and t-1, of at least 10 employees, and

d) the reduction corresponds to at least 20 percent of the workforce.