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A study of individuals who exit the Swedish shipbuilding industry 1970-2000

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ABSTRACT

This paper follows the industry employment histories of all individuals at some point affiliated with the dismantling Swedish shipbuilding industry 1970-2000. We analyse the situation of the individual workers leaving shipbuilding through investigating to what extent they were employed at all, tended to move to related sectors inside or outside the region, and whether such moves were beneficial for the individuals. By cross-using German and Swedish data, our findings indicate a notable impact of regional industrial structure on the movement and success of individuals, and that individuals moving from shipbuilding to related sectors benefit more from moving than others.

1. Introduction

In the recent past, many old-industrial regions in Europe and North America have been challenged by severe structural change, caused by the dismantling of dominating mature industries (see e.g. Hassink and Shin, 2005; Hudson, 2005; Birch *et al.* 2008). Indeed, the downsizing or even seizure of production in dominating mature industries sets of processes where redundant resources and labor in the region need to be reallocated from old to new industries in order to stay productive, or they may be forced to leave the region. But geographical and industrial mobility for workers leaving the region may also come at an individual cost. The costs of leaving the industry, home, friends and family may take time to compensate (Fischer *et al.*, 1998), and professional networks and knowledge about regional routines and 'the ways things are done' in regions need to be built anew. However, for some there may be salvation at home. Current arguments in the literature suggest that reallocation of displaced workers can be especially alleviated in regions which host many *related* industries, where previously acquired skills among the labor force can be readily used, or used in new combinations. For the regional economy, the opportunity for workers to remain in the same region without being subject to skill-destruction will impact the transformative capability of regional economies (Diodato and Weterings, 2012). Also, the characteristics of the process are likely to vary with the speed of transformation. During an incremental downsizing process employees will have more time to adapt and consider viable options, while radical change (for instance in case of sudden shutdown) will pose larger and more drastic challenges to individuals and regions alike.

Focussing on the once successful but subsequently dismantling Swedish shipbuilding industry, the aim of this paper is to analyse regional labor market outcomes of the workers at some point affiliated with this mature industry during the period 1970-2000. We investigate to what the individuals tended to stay in the industry or to move to related sectors, inside or outside the region, and whether such moves were beneficial for the individuals. Also, the paper aims to investigate how the regional economic structure impacted the propensity of workers to stay in the same industry, or move to related economic activities.

This research follows up and further develops especially the investigations made on employees leaving Danish shipyards by Holm *et al.* (2012), but also other studies in regional science and economic geography investigating the development of the shipyard industry in European regions, such as van Kling and de Langen (2001), Eich-Born and Hassink (2005) and Fornahl *et al.* (2012). Compared to the existing literature, we widen the research focus to all persons at some point affiliated with shipbuilding, not only focussing on the actual closing down for the shipyards. Also, we define the degree of skill-relatedness between the shipbuilding industry and other sectors by adopting the inter-industry skill-relatedness measure introduced by Neffke and Henning (2013) and modified in later contributions (Neffke *et al.*, 2013). But to mitigate problems of circular reasoning in our investigation of the Swedish individual data, we use West-German individual employment information to assess which sectors that are skill-related with shipbuilding.

2. Theoretical background

Recent literature in evolutionary economic geography (Boschma and Frenken, 2006; Boschma and Martin, 2010) has come quite far in describing and understanding how regions develop new growth paths (Frenken and Boschma 2007; Neffke *et al.*, 2011). Especially, recent findings have highlighted the importance of related regional diversification and industrial branching where substantial parts of established regional capacities can be used, often in combination with newly built capabilities, to accommodate new varieties of production (Neffke *et al.*, 2011; Boschma *et al.*, 2012).However, there are ample reasons to believe that qualitative change in the economy will come at a price for some regions and individuals. The labor economics literature hosts nowadays many examples of studies dealing with "job separation" in the economy using detailed individual data matching employers and employees longitudinally (e.g. Davis and Haltiwanger, 1999; Fredriksen and Westergaard-Nielsen, 2007). An increasing emphasis on the micro-level (individuals) in the study of industrial restructuring is timely. Following endogenous growth theory, the analysis of individual labor market trajectories and the geography of human capital flows are of particular importance since human capital is acknowledged as an important driver of regional development (e.g. Lucas, 1988). Human capital fosters knowledge spillovers and innovation (Becker, 1964), and the mobility of workers is regarded a crucial mechanism to diffuse embodied knowledge in space (Boschma *et al.*, 2009; Iammarino and McCann, 2006; Rodriguez-Posé and Vilalta-Bufi, 2005; Saxenian and Sabel, 2008).

The literature has only to a limited extent addressed what factors influence individual outcomes of regional economic change, and how this co-varies with regional branching processes and the characteristics of regional economic environments. One notable exception is the work by Holm *et al.* (2012) who in detail study workers being laid off from four Danish shipyards, and especially what regional aspects affects the likelihood of workers receiving new jobs or increased wage. Their outcomes show that the geographical location of firms is likely to affect the outcomes of change to individuals, as well as the industry to which the individual moves.

In this paper, we are specifically interested in two aspects limiting the scope of labor market moves by individuals in the process of industrial restructuring: Skill-relatedness and the characteristics of the regional economic structure. First, recent observations in economic geography underline the fact that labor market flows are far from random over the industry spectrum. Neffke and Henning (2013) reasoned that individuals are likely to move between related industries, i.e. industries that share dependence on the same types of skills. By such moves between *skill-related* industries, individuals are able to use parts of their achieved human capital also in their new job. Essentially, this implies that sharing of productive resources between industries can be tracked through flows of labor between industries (Neffke and Henning, 2013).

Second, abundant empirical observations highlight that the movement of individuals on the labor market and during industrial restructuring processes may be constrained by place (regional) concerns due to economic, social and institutional reasons (Sjaastad, 1962;

Storper and Walker, 1989). Lundholm (2007) showed a very persistent pattern of inter-regional migration flows between 1970 and 2001 in Sweden, despite institutional arrangements aiming to facilitate mobility. Individuals performing these moves are in their early career stages before having established themselves on the labor market, while when established the majority of workers tend to remain within the same local labor market. Studying inter-regional job changes, Eriksson *et al.* (2008) showed that only about 25% of all job moves cross labor market boundaries.

The literature gives several reasons why job flows should have a predominantly regional character. Searching and finding a new job is time consuming and related to both monetary (Burdett and Mortensen, 1980) and social costs (van den Berg, 1992). Many people of course have established social- and family networks that would make them reluctant to move. This would be especially the case for families with children and with high and increasing female participation rates, opportunities for both spouses to find jobs is often an important prerequisite for moving. Moreover, a person's network, which often has a local bias, is often a vital source of information about job opportunities (e.g. Granovetter, 1973).

Skill- and place considerations are not two distinct analytical dimensions. The interconnectedness between embodied skills and place has its perhaps most classical example in the Marshallian industrial districts, where one important dimension for Marshall was the industrial district as a market for skill (Marshall 1890). In fact, one might argue that in some places region-specific knowledge will develop, or at least differences in regional routines will emerge. Rigby and Essletzbichler (1997, 2006) demonstrated that regions have significant and persistent differences in production techniques. If this somehow is a reflection in variations in the characteristics of regional knowledge that would also constitute a component of the individual human capital, this implies that an individual leaving the region for a job in another region often would need to adapt to new circumstances. Parts of the human capital would be lost, and required to be built up again. Similarly, Eriksson *et al.* (2008) argue that the predominantly local dimension of labor market dynamics is due to the place- and sector-specific human capital of individuals (see also Boschma *et al.*, 2009; Eriksson, 2011). Such 'insider knowledge' (c.f. Fischer *et al.*, 1998) accumulated through relations to family, friends, clients and colleagues as well as experience of industry-specific norms and routines become a sunk cost and a barrier to moving.

We may also expect that inter-regional labor mobility patterns will be affected by the presence of business in same or related industries in the region. "Matching economies", the efficiency of job matching processes (Duranton and Puga, 2004; Puga, 2010), are essential to understand individual outcomes during industrial transformation. From this perspective thick urban labor markets are generally regarded to increase the chances for workers to find new employment. However, as demonstrated by Boschma *et al.* (2014) on Swedish regions, the chances to find *any job* is greater in thick and diverse labor markets while the *quality* of matching is greater in regions with concentrations of skill-related industries and that is what produce production complementarities and regional renewal. This extends the traditional Marshallian notion of intra-industry pooling and matching as a source to agglomeration economies by showing that pooling can work across sectors if they rely on similar (i.e., related) sets of skills. Thus, the effects of the job change is expected to be greater in regions with a concentration of skill-related industries, since the transfer of human capital is facilitated as compared to moving to completely unrelated sectors.

3. Hypotheses

We formulate the following expectations:

H1. Workers that move to related industries benefit in terms of higher wages.

H2. Workers will benefit from staying in the same region in terms of higher wages, even when leaving their original industry.

H3. Workers that are located in strong shipyard clusters, have a higher likelihood of remaining in the industry while regional presence of related industries decreases the probability that the workers will stay in the industry.[i]

H4. A regional presence of related industries will increase the probability of finding new employment when leaving the shipbuilding industry.

4. Research design

4.1 Data issues

The empirical analysis is based on a matched employer-employee dataset 1970 to 2000, obtained from Statistics Sweden. While data from 1990 and onwards originates from official annual registers (RAMS), the data prior to 1990 originates from national censuses (Folk och bostadsräkningen). This covers the entire Swedish population with five year intervals. Our selection of individuals is based on people employed in the shipbuilding those years. Adding to this the years 1990 and 1995 (and complementing with the end year 2000), we end up with a total of 6 measurement periods for which we compare the individual statuses in t_{+5}. Apart from being affiliated to the shipbuilding industry (4-digit NACE = 3841) we restricted our sample to only include workers with a work-rate of more than 50% of full time.

In preparatory data procedures, all sectors were recoded to the 1969 (SNI69) revision of the industrial classification scheme. Also, due to radical municipal reforms during our investigated period, all municipalities were recoded to the 2010 definition. We define functional regions (or local labor markets) according to the Swedish 'A-regions' (N=70), normally consisting of several municipalities and defined after labor market and central-place considerations.

[i] In this article, clusters are defined as an industry-specific regional concentration of economic activities, rather than a Porterian cluster defined by value-chain linkages.

4.2 Dependent variables

For the regressions, two different dependent variables were created (for definitions and descriptives see Table A1 in the Appendix). First, we want to assess which determinants are essential for the fact that workers stay in the industry, leave for another industry or are not employed. We create a categorical variable (Status), which equals 1 if workers remain in the industry between two measurement periods (t_0 to t_{+5}), equals 2 if workers leave the industry but is employed in another industry in t_{+5}, and 3 if the worker is not working in t_{+5}. In line with Holm *et al.* (2012), our second dependent variable is a dummy indicating whether workers earn more after leaving the shipbuilding industry. This is to assess what characterise workers that managed to successfully transfer their human capital to a new employer (i.e. performing the move with increased wage). Following Holm *et al.* (2012) we use the workers' relative wage, rather than observed wage, to capture potential unobserved factors (such as informal human capital). First, we run a regression each year on the entire Swedish workforce, where wage income is regressed on age (same categories as described further below), sex, education, industry (ten 1-digit categories) and regional dummies (N=70). Second, the observed income is then divided with the fitted values of these regressions to produce an indicator for relative wage for each worker. The dependent variable HigherInc is then defined as Y=1 if the relative wage in t_{+5} is higher than in t_0 (in 2010 price levels). We take this increase in relative wage as reflecting that the worker has skills or human capital that could be transferred to, and become productive in, a new sector.

4.3 Definition of skill relatedness

One way to measure the skill-relatedness between industries is by analyzing flows of (skilled) labor between these industries (Neffke and Henning, 2013). In our case however, using the same labor mobility dataset to calculate the skill-relatedness, as well studying the impacts of these labor flows, would be highly problematic. To remedy this problem, we derive data on job switches of all full-time employees across all pairs of industries i and j between t and t_{+1} in West Germany in the period 1975 to 2003 from the Employment History Panel (EHP) (Bender *et al.*, 2000).[ii] We measure inter-industry relatedness for 205 three-digit-industries of the German System of Industrial Classification 1973. This was done by, first, observing the real flows between all industry pairs. Secondly, we establish expected baseline labor flows across all industry pairs by estimating zero-inflated negative binomial models. This is in line with the methodology suggested by Neffke and Henning (2013), and we use the same set of control variables in the regressions. To obtain a measure of skill-relatedness, we then take the ratio between observed and predicted flows. This means that greater labor flows than expected is taken as an indicator of the industries being related. Thereby, we obtain 27 matrices (1975/76, 1976/77 … 2002/03), which

[ii] This database is provided by the Institute of Employment Research (IAB) and is constructed from Germany's social security records.

contain values of skill-relatedness between all industry pairs (205 x 205 combinations). This classification was then translated to the Swedish industry classification system.

4.4 Independent variables

Our key independent variables refer altogether to the regional level and consist of two groups. The first group refers to the regional composition of industries, and the second group refers to the destination of workers leaving the shipbuilding industry. We also control for a host of complementary individual traits.

To address whether the regional industrial portfolio influences the probability of workers to remain in the industry, three independent variables capture the relatedness, specialization and diversity of the region. The degree of relative presence of related industries in each region is calculated using a location coefficient of skill-related industries j of the industry i (shipbuilding industry):

$$LQ_i = \frac{emp_{jr} \Big/ \sum_r emp_{jr}}{\sum_j emp_{jr} \Big/ \sum_{jr} emp_{jr}}$$

where LQ_j is the location coefficient of the related industries j to industry i, emp_{jr} is the number of full-time equivalents in industries j and region r. Regional industry specialization is then similarly defined as the traditional location quotient of shipbuilding (thus this time taking only shipbuilding industries into account). In the regressions, the logarithmic values of the specialization measures are used to reduce the impact of a skewed distribution. The final regional variable is the degree of unrelated industries (UnrelSizeLog). This is defined as the (logarithmic) number of employees working in any industry except shipbuilding or related industries. We introduce this variable to capture size and variety of regional industrial portfolios.

The second group of independent variables consists of five different dummy variables that are set to capture the future destiny of workers leaving the industry. The first indicates whether they remain in the same region or leave for work in another region (NewReg). In order to tack the importance of obtaining jobs in related sectors in the same or new regions we create regional dummies that decompose regional and skill-relatedness dimensions into four dummy variables that capture whether workers (i) remain within the same region and move to a related industry (SRegRel), (ii) remain within the region but move to a different, or unrelated, industry (SRegDiff), (iii) change region and move to a related industry (ORegRel), and finally, (iv) change region but move to a unrelated industry (ORegDiff). The last variable is used as baseline in all regressions.

We also construct a number of additional variables to control for certain individual traits. Three dummy variables are set to reflect the age of workers (less than 35 years, between 35 and 50 years and older than 50 years). Previous studies highlight that an aging workforce is a strong determinant of declining industries (e.g. Andersson and Lindmark, 2008). That is partly due to the fact that young people are more likely to find other employment opportunities while older workers have accumulated a more sector-specific human capital that become a sunk-cost if moving (c.f Sjaastad, 1962; *Eriksson et al.*, 2008). Also, in line with human capital theory (e.g. Becker, 1964), it is reasonable to assume that workers with a formal training are more likely to have greater shares of transferable skills (formal human capital) than workers that are trained in-house. Since the censuses (1970-1985) do not contain full information on education across all years but have very detailed occupation data, while the registers (1990-2000) contain educational data but not occupation, we created an indicator labelled Academics. This dummy variable equals one if the worker either has an occupation that requires a university diploma (prior to 1990), or at least have a bachelor's degree (after 1990). Further, as noted by Holm *et al.* (2012), achieving a higher education may influence the relative wage increase for people leaving the industry. To consider this, another dummy (HigherEd) was created and equals one if the worker has *obtained* a Bachelor's degree (or an equivalent occupation) between two measurement periods. Finally, the shipbuilding industry was a predominantly male dominated sector and previous studies have shown that men were more likely to be reemployed and also had greater wage increase after a plant closure than females (Holm *et al.*, 2012). We therefore include a dummy variable for female. We also introduced regional dummies (as well as specific dummies for regions in the West, East and South of Sweden) and an additional controller for family (whether the worker had a wife and/or children each year). Neither of these influenced the outcomes of the models and were omitted from the final outputs.

5. Empirical results

5.1 The relatedness patterns of shipbuilding

Applying the skill-relatedness method to the German data, we find that the shipbuilding industry is skill-related to a total of 86 industries throughout the whole time period. This number, however, decreases significantly over time. On average, the shipbuilding industry was related to a set of 24 different industries in the 1970s and 1980s, and to 10 industries in the 1990s and 2000s. The majority out of the 86 related industries were only short-term related, and only 12 industries were related to the shipbuilding industry for at least 10 years or longer. We only take these consistently and long-term related industries into consideration for our analysis in this paper, and it should be noted that this is a very conservative estimate of the industries related to shipbuilding. These industries are displayed in Figure 1 where the number in each node (industry) refers to the total number of years of skill-relatedness. The majority of skill-related industries to shipbuilding could be found in the manufacturing sector (blue nodes), for example in steelwork, mechanical engineering and metal engineering. We also identify strong and consistent relatedness links to industries that are not considered as related in the standard classification system, such as technical consultancy and ship transport agents.

Figure 1: Network skill-relatedness graph of the shipbuilding industry in West Germany

5.2 Descriptive evidence

In particular from the beginning 1980s onwards, many of the traditional shipyards situated in Europe were not competitive anymore compared to newly emerging shipbuilding nations. The changing global competitiveness scene also had the most severe impact on the Swedish shipbuilding industry. In the 1940s to 1960s, Sweden was one of the world's leading shipbuilding nations. Gothenburg ranked as one of the most important shipbuilding cities in the world (SNA, 1997). As shown in Figure 2 (upper panel), in 1970 most of industry employment was concentrated in the Gothenburg and Uddevalla regions in the west of Sweden, and in the Malmö and Helsingborg (i.e. Landskrona) regions in the south of the country. In the 1970s, the increased competition from Asian actors lead to decreased profits, and prompted the Swedish government to introduce subsidies to stimulate employment despite profitability problems. New wage settings systems in the late 1970s in combination with institutional changes that introduced unofficial manpower firms aiming to secure employment in the already struggling industry, triggered employment increase but also lead to lower relative wages. In the late 1970s, several important Swedish shipyards were taken over by state-owned conglomerate Svenska Varv (Swedish Shipyards), with the idea to restructure and out-phase the shipbuilding industry (SNA, 1997).

However, these actions did not secure the Swedish shipbuilding industry for the future. In 1981 the first shipyard closed (Öresund in Landskrona). After a short time of stability in the early 1980s, the remaining shipyards in Sweden were rather modern and started to diversify their production (SNA, 1997), but as state subsidies ended in 1985 Uddevalla was closed down almost immediately. Shortly after, in the end of the 1980s, Götaverken (Gothenburg) and Kockums (Malmö) seized their production. The phasing out sequence is obvious from the maps of Figure 2 (upper panel). Some shipyards remain to this day, but they are predominantly repair facilities, or very specialized shipyards, for example geared towards advanced military applications (SNA, 1997). The lower panel of Figure 2, also shows that related sectors were clustered in and around shipbuilding regions and that this concentration diminished over time as the shipbuilding industry contracted.

Figure 2: The spatial evolution of employment (A) and related specialization (B) in the Swedish shipbuilding industry 1970, 1985 and 2000.

Table 1 shows information on six cohorts of workers that were employed in the Swedish shipbuilding industry in t_0. Apart from being retired in t_{+5}, these workers could either remain in the same industry (In shipyard), have moved to another job in another industry

(Not in shipyard), or not work (unemployment, student at university, parental leave etc.). The size of the first three cohorts varies between 24,000 (1980) and 37,000 (1975) workers. The large number in 1975 is due to the increasing employment of workers through employment agencies. During the 1980s crisis the total number of employees in shipbuilding decreases dramatically, from about 14,000 (1985) to 6,000 (1995). We can follow up the subsequent employment histories of the majority of these workers. Five years later, a proportion of 11 to 22 percent of these workers are not reported in the database anymore for the aforementioned reasons. Less than 10 percent of each cohort turned out to be retired five years later. All in all, the histories of at least 70 percent (cohort 1980) to 79 percent (cohort 1970) shipyard employees can be traced in the database. Five years later, a major part of the workers are still working in the shipbuilding industry. The shares of workers that find a job in another industry within this five-year period are smaller, yet sizeable. However, a very different pattern could be observed in the initial year of the 1985 crisis of this industry. In this year, 50 percent of the workers of this cohort did find a job in another industry.

Table 1: Number of workers employed in shipbuilding industry 1970-1995 and their status in t_{+5}.

Next, we focus on the industrial and geographical mobility of all workers who left the shipbuilding industry, but were still employed in t_{+5} (Table 2). On average, 71 percent of the leavers moved to new jobs in industries that are not skill-related to the shipyard industry. About three out of ten leavers started a new job in related industries. This pattern is to be observed in all cohorts except for the cohort 1970. Among workers of this cohort the relative flows to related industries where highest (45 percent). On average, 19 percent of workers leaving shipbuilding moved to another region when switching to a new job that is either in an unrelated (14 percent) or related industry (5 percent). In turn, the majority of the leavers (81 percent) remained in the same region and most of these workers found new jobs in unrelated industries. However, it is important to remember that we employ a very restrictive relatedness definition. In this light, the on average 28 percent that move to related industries may be considered as a high number.

Table 3 provides a more detailed description of the industry destinations of the workers leaving the industry. Many of these main target industries are related to shipbuilding by our definition (such as metal products and mechanical engineering equipment). Interestingly, quite some workers were able to find employment in the growing automotive industry, although it is safe to say that the growth of this industry alone was not able to compensate for the destructed jobs in traditional industrial regions.

Table 2: Geographical destination of workers leaving the shipbuilding industry

Table 3: The top five most common industries for workers leaving the shipbuilding industry (skill-related sectors in bold).

Turning to the wage structure of the individuals prior to and after mobility, the relative wage in t_0 and the change ratios of wages (rw_{t+5}/ rw_{t0}) are depicted in Table 4. On average the workers still in shipbuilding have got, at the outset, a one percent higher wage than expected given age, sex, location and our other predictors. Workers leaving the industry had on average one percent lower relative wage. However, this is mainly the case for individuals leaving the industry but who remain within the same region, since their relative wage is about three percent lower at the outset, than the workers finding work in a different region. Individuals leaving the region and shipbuilding industry are relatively better paid. Also, individuals moving to related industries have a lower relative wage than those moving to unrelated industries.

Moving to the last column of Table 4, showing the percentage of workers receiving a higher income after staying in or moving out of shipbuilding in t_{+5}, the different scores indicate that a greater share of workers staying in the industry receive a higher relative wage as compared to leavers (79 compared to 74 percent). While the workers finding another job in the same region had lower initial relative wages, a greater share of these workers increased their relative income as compared to workers leaving the region. This is especially the case for workers ending up in related industries within the same region. This suggests that staying in the region was most beneficial for workers, since they are less subject to skill-destruction as their human capital can be redeployed within the regional economy. This is particularly the case for those moving to related industries. Worst off are workers moving to unrelated industries in other regions.

Table 4: Comparison of relative wage (rw_t_0) and share (%) of workers with relative wage increase among workers staying in shipbuilding and those not staying in shipbuilding t+5

This descriptive evidence points to a preliminary confirmation of our hypotheses H1 and H2, that workers that move to related industries benefit in terms of higher wages, and that workers will benefit from staying in the same region in terms of higher wages, even when leaving their original industry. However, there are obvious reasons to believe that many other variables also influence wage patterns. Table 5 displays some key-differences between those workers that leave the region, compared to the ones that remain. Indeed, the workers leaving the region tend to have higher initial relative wages than the workers remaining in the region. Importantly however, the ones changing regions were younger and more highly educated, and had to a lesser extent a family. Also, workers finding employment in other regions were younger during the early period, and academics were more likely to change region during (and after) the crisis. These patterns calls for a further investigation within a multivariate framework to corroborate our descriptive findings.

Table 5: Description of workers leaving the shipbuilding industry with employment t_{+5} that stay within the same region or leave for another region.

5.3 Regression results

For the multivariate analysis two different logistic models were estimated. The first model concerns the determinants of staying in the shipyard industry, working in another industry or not being employed, while the second model highlights impact factors on relative wage increase. For the first dependent variable (Status) displayed in Table 6, a multinominal logistic model is applied to handle the categorical outcome. The second model (displayed in Table 7) is a binary logistic model. Both models share a vector of worker-specific variables and a vector of regional-specific variables while the logistic model also includes a vector of variables indicating where the individuals work in t_{+5}. We start with estimating pooled regressions for all years, we then continue with separate regressions for the years 1970-1980 (pre-crisis) and 1985-1995 (crisis), before running separate regressions for each year to explicitly address the time effects. For the pooled regressions, year-dummies are included to control for time-specific heterogeneity. In all models cluster-robust standard errors at the regional level is reported to allow for intra-regional correlations (Cameron und Trivedi, 2005).

In the first step we thus investigate which factors explain the future position of the shipbuilding workers with the workers occupied in a new sector in t_{+5} being the reference group (Table 6). Turning to hypotheses H3 and H4 (about the importance of specialization in the same and/or related industries), we find that the regional portfolios of economic activities have a significant impact on the future position of these workers, both with (7095A) and without (7095B) individual controllers. The location coefficient in the shipbuilding industry has got a positive significant impact on worker's propensity to remain in the industry. A high degree of industry specialization contributes positively to the duration of jobs in this industry, but also to an increased likelihood of not being employed in t_{+5}. A high (low) specialization of related industries indicates whether the shipbuilding industry is strongly (weakly) embedded in a regional economy (Neffke et al., 2012). In line with our expectation (H4), we also find a negative impact on the probability of staying in the industry from such embeddedness, while the likelihood of not being employed also decreases for workers in regions with many related industries. This implies that shipyard workers have got sufficient opportunities to move to jobs in skill-related industries within a region due to many related sectors offering a high matching quality (Boschma *et al.*, 2014).

These findings confirm our hypotheses H3 and H4: Industry specialization increases the likelihood of remaining in the industry while related specialization implies a better chance of transferring embodied human capital to new sectors, which in the latter case also seems to protect workers from unemployment.

Table 5: Multinominal logistic models on the likelihood of (A) still work in shipbuilding, and (B) not working, compared to leaving the industry for another job. Coefficients and cluster-robust standard errors at regional level (within brackets) are reported.

The individual characteristics variables are also in line with intuitive expectations. Younger workers are more likely to leave the industry than older employees (Andersson and Lindmark, 2008), and so is the small share of females employed in the industry as well as workers that obtain a higher education. However, already highly educated workers are generally less likely to change industry, as well as workers with a high relative wage in t_0. The latter could be argued to reflect specialized skills that are less transferable to other workplaces (Becker, 1964; Holm *et al.*, 2012). In contrast, younger and high-qualified workers that have obtained more general human capital have better opportunities to make use of their human capital in other adequate jobs. The lower part of the model, which estimates the likelihood of not being employed, shows that older workers face greater risks of not working compared to younger workers, while higher education (both already having but also acquiring) decreases the risk of not working.

An interesting complementary question is whether we can observe different effects of the regional and individual determinants before (7080) and during the crisis (8595), as compared to in the general model. Regarding the regional determinants in general, the signs of their coefficients do not change. In 1985, the most prominent year of the crisis, this pattern is however interrupted by the fact that related regional specialization turns positive while both the industry specialization and concentration of unrelated sectors turns significantly negative. This could be attributed to the fact that the related industries on the one hand also decline (as shown in Figure 2, and also become saturated and the competition of available jobs became fiercer. Compared to before the crisis females and higher educated workers were more likely to remain in the industry than after, which can be due to the fact that some administrative functions still were running even after production stopped (SNA, 1997).

Turning back to the issue of post-exit wages (hypothesis H1 and H2), the second step is to determine which workers managed to avoid severe skill-destruction when leaving the industry. We do that by regressing yet another series of logistic models (Y=1 if relative wage increases) on the workers not still in shipbuilding t_{+5} but in employment (Table 7). We thus only include the baseline group from the previous model, and remove all workers still working in the industry and those without work. The expectation is that not only finding a new job is important, but it is also important whether it is possible to transfer the embodied knowledge to the new workplace. This is done by first assessing the full model (all years) with a dummy indicating whether the worker starts working in the same or another region (7095A). We then decompose this indicator to capture whether they remain in the region but start working in a related or unrelated sector, or whether they find a job in another region in related or unrelated industries during the entire period (7095B). In accordance with Table 5, separate regressions are estimated before the crisis (7080) and during the crisis (8595), followed by separate regressions for each year.

Table 7: Logistic models on relative wage increase (Y=1) for workers leaving the region the entire period, pre- and post-crisis and for each year. Coefficients and standard errors (within brackets) are reported.

Based on the results in Table 7, model 7095A shows that geographical mobility reduces the likelihood of receiving a higher wage significantly. This is in line with hypothesis H2. A positive effect of remaining in the same region is however mainly attributed to workers ending up with new jobs in related industries (7095B), prior to the crisis (7080), which is in line with hypothesis H1. The outcomes from the other individual and regional variables indicate that a diverse environment on the regional labor market in general is sustaining the relative wage increases of shipyard leavers. Further, the level of the initial wage in t_0 has got a negative impact on relative wage growth. In addition, the earning prospects of former shipyard employees that are older than 50 years are significantly negative. These two outcomes corroborate that workers at the end of their career do not have favourable opportunities to raise their wages by means of a job switch. The fact that even younger workers have to face a relative wage loss if they have left the shipyard can be seen as consequence of the severe crisis. High-qualified workers and employees that completed a university degree have good preconditions for a relative increase of their wages if they leave the industry.

6. Discussion and conclusions

In general, our findings support the expectations formulated in the hypotheses. Although we employed a very strict definition of skill-relatedness by defining only the 12 most consistently related industries as “related”, we found that workers that move to skill-related industries tend to benefit in terms of higher wages compared to others. However, we also find indications that the workers who *remain* in the shipbuilding industry are more specialized, since they earn more than expected as compared to workers leaving the industry. Indeed, this might be a sign of a selection effect as less skilled, experienced and specialized workers tend to leave, or become pushed out of, mature industries. More experienced workers in the shipyard industry are better paid and their human capital relies more strongly on long-term inhouse-training (Becker, 1964). Thus, they still perceive having better career opportunities in the industry itself, which is the reason why many declining industries tend to have a relatively older workforce (Andersson and Lindmark, 2008). On the same note however, the workers finding a job in related industries can be said to possess slightly less specialized skills than workers ending up in unrelated industries. This is in line with the findings of Boschma *et al.* (2014) on regional flows and could be explained by the fact that fast growing firms and sectors tend to hire more inexperienced workers that could be trained in-house (Coad *et al.*, 2014).

We also find that workers will benefit from staying in the same region in terms of higher wages, even when leaving their original industry. Workers leaving the region, thus, face greater skill-destruction since place-specific human capital become a sunk-cost when leaving (Fischer *et al.*, 1998). Indeed, our findings relate to the discussion in the literature about region specific knowledge or routines. When an individual with some working experience leaves a region she not only sacrifices some of the built up networks, but has also to acquire some parts of its human capital anew. Worst off are workers moving to unrelated industries in other regions because they are less likely to use their human capital within the region- and industry-specific context (c.f. Eriksson, 2011).

Also, we identify important relationships between regional environments and individual trajectories. Workers that are located in strong shipyard clusters have a higher likelihood of remaining in the industry, while regional presence of related industries decreases the probability that the workers will stay in the industry. Also, in line with the hypotheses, the specialization of related industries at the regional level will matter for individuals exiting a mature industry, as these individuals will benefit from staying in the region, and move to related industries where their acquired human capital can be re-used. A high regional degree of related industries facilitates a qualitative skill matching and protect workers and regions from skill-destruction.

However, we find deviations from these patterns for individual years, and especially for the some of the worst crisis years for Swedish shipbuilding during the mid- and late 1980s. Over time, we observe a contraction also of industries related to shipbuilding. These patterns suggest what Diodato and Weterings (2012) found in their Dutch simulations that related industries are strongly affected by the decline of a key industry, especially during a deep crisis. This is reflected by the significantly (though moderate) positive score of related specialization on the likelihood of not being employed in 1985. Related specialization might mainly protect from unemployment prior to a deep crisis or steady decline, while it does not so much act as a regional chock absorber during the very crisis since also the related sectors are affected when a key sector contracts. However, such processes are likely to differ depending on the stage of matureness of an industry or complex of industries, and between radical and incremental change. According to Neffke *et al.* (2013) different growth rates among related industries and a core industry may increase the absorptive capacity of the regional economy. This motivates why plants located in regions with high related specialization actually may have managed the downturn better than shipyards in highly industry specialized or diverse regions and therefore sustained industry employment. We believe that further investigations on the regional labor market dynamics and consequences for individuals are important not only to fine-tune our knowledge about these processes at large but to shed more light on regional transformation processes and its consequences for different parts of the labor force.

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Figures and tables

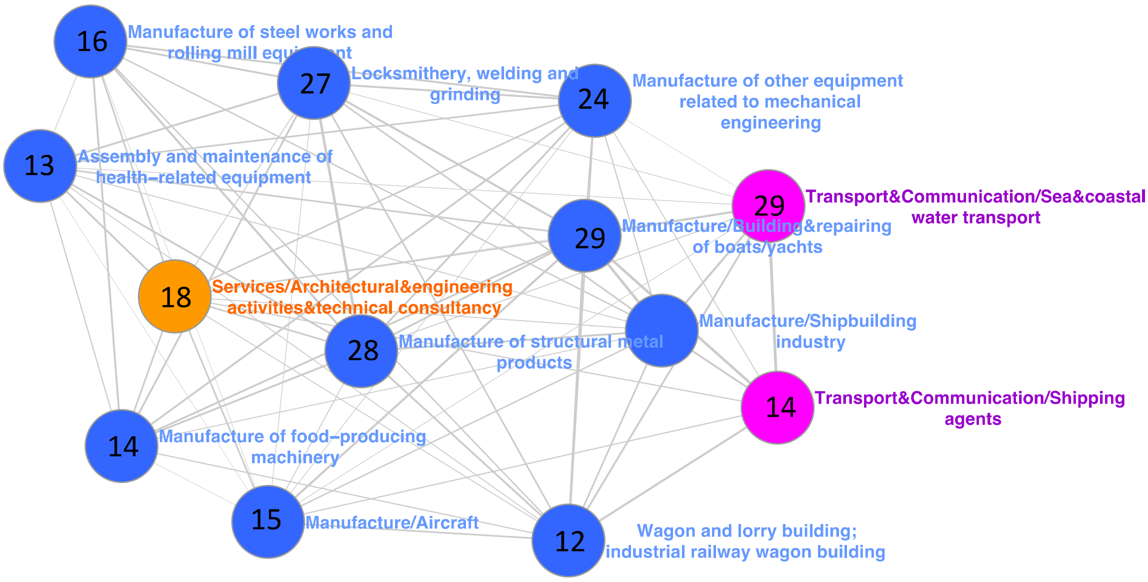

Figure 1: Network skill-relatedness graph of the shipbuilding industry in West Germany

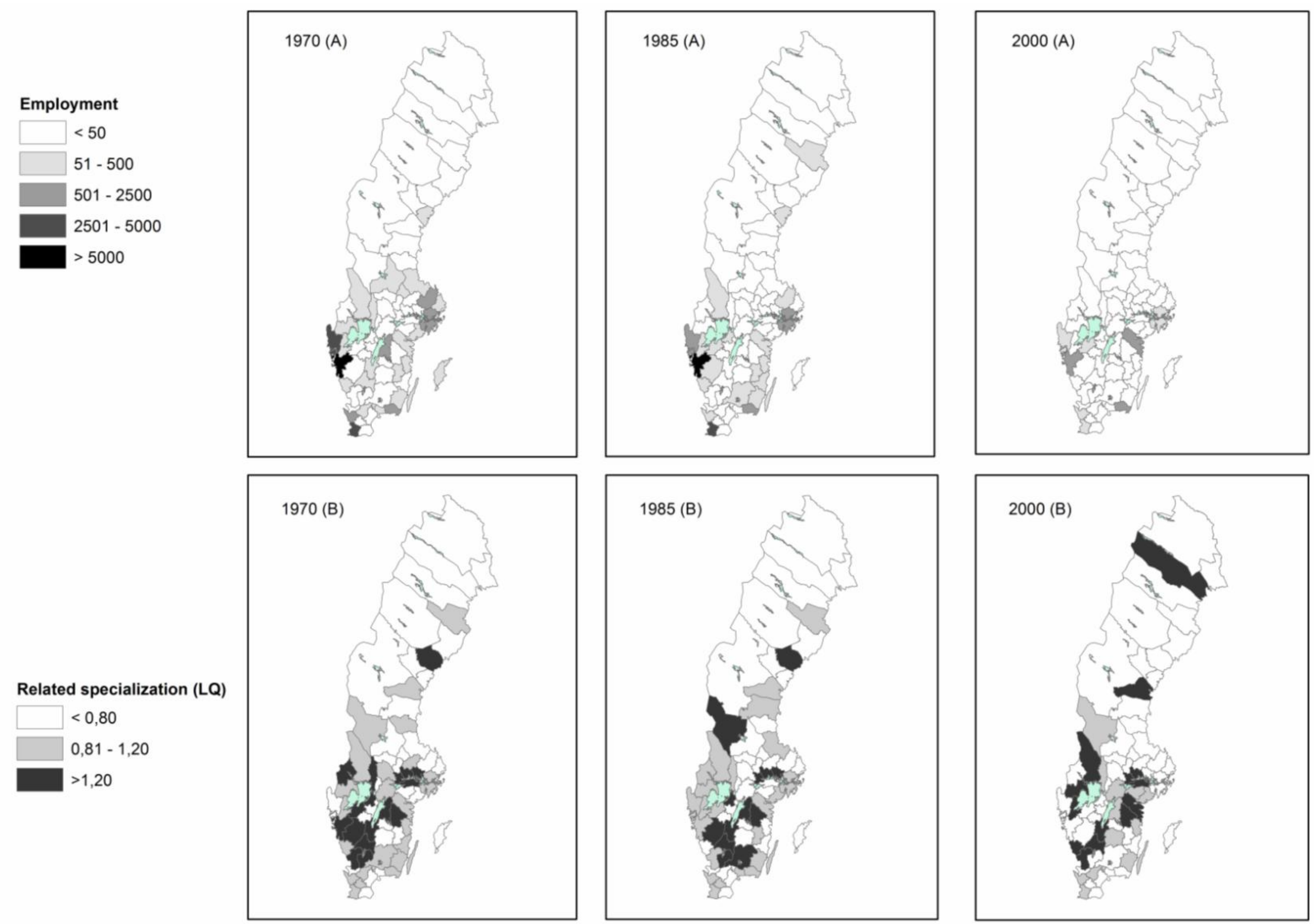

Figure 2: The spatial evolution of employment (A) and related specialization (B) in the Swedish shipbuilding industry 1970, 1985 and 2000.

Table 1: Number of people employed in shipbuilding industry 1970-1995 and their status in t+5.

	1970	1975	1980	1985	1990	1995
Number of workers	28,548	37,276	24,280	13,763	7,341	6,193
In shipyard t5	17,343	17,324	9,874	3,268	4,041	3,231
	(60%)	(46%)	(40%)	(23%)	(55%)	(52%)
Not in shipyard t5	5,282	11,963	7,277	6,911	1,410	1,796
	(19%)	(32%)	(29%)	(50%)	(19%)	(29%)
Not working t5	3,292	5,257	5,351	3,053	1,536	779
	(11%)	(14%)	(22%)	(22%)	(21%)	(12%)
Retired t5	2,631	2,732	1,778	531	354	387
	(9%)	(7%)	(8%)	(4%)	(5%)	(6%)

Table 2: Destination of people leaving the shipbuilding industry

	1970	1975	1980	1985	1990	1995	Total
Number of workers not in shipyard (N)	5,282	11,963	7,277	6,911	1,410	1,796	34,639
Related industry (%)	45	26	33	22	26	22	29
Unrelated industry (%)	55	74	67	78	74	78	71
Same region, related industry (%)	36	21	26	19	22	17	24
Same region, unrelated industry (%)	43	62	53	69	60	56	57
Different region, related industry (%)	9	5	7	3	4	5	5
Different region, unrelated industry (%)	12	12	14	10	14	21	14

Table 3: The top five most common industries (N= 239) for workers leaving the shipbuilding industry. Skill-related sectors in bold.

1970		1975		1980	
Sector	*%*	*Sector*	*%*	*Sector*	*%*
Manu of structural metal products	15.7	Manu of turbines	7.7	Automotive	12.8
Manu of metal- and wood working machinery	8.7	**Manu of structural metal products**	6.8	**Manu of structural metal products**	8.8
Manu of other equipment related to mechanical engineering	8.1	Automotive	5.9	Manu of metal tanks and containers	8.6
Automotive	6.6	Manu of metal tanks and containers	4.9	**Manu of other equipment related to mechanical engineering**	5.1
Manu of food-producing machinery	**4.7**	Construction	4.5	**Manu of food-producing machinery**	4.0
Total number of flows	5,282	Total number of flows	11,963	Total number of flows	7,277
Total number of sectors	196	Total number of sectors	211	Total number of sectors	143
1985		**1990**		**1995**	
Sector	*%*	*Sector*	*%*	*Sector*	*%*
Manu and repairing of boats and yachts	15.9	Manu of parts and accessories for motor vehicles	14.3	Manu of metal tanks and containers	11.9
Construction	7.5	Manu of metal tanks and containers	8.1	Manu of parts and accessories for motor vehicles	11.3
Manu of metal tanks and containers	7.4	**Wagon & lorry building**	7.2	Financial services	7.3
Automotive	6.0	Automotive	6.5	Automotive	6.9
Manu of structural metal products	5.6	**Manu of other equipment related to mechanical engineering**	6.0	Other consultancy (technical and social)	5.4
Total number of flows	6,911	Total number of flows	1,410	Total number of flows	1,769
Total number of sectors	133	Total number of sectors	107	Total number of sectors	104

Table 4: Comparison of relative wage (rw_t_0) and share (%) of workers with relative wage increase among workers staying in shipbuilding and those not staying in shipbuilding t+5

	Relative wage	**Higher relative income (%)**
Still in shipbuilding	1.01	79
Not in shipbuilding		
All workers	0.99	74
New region	1.03	72
Same region, related industry	0.98	77
Same region, unrelated industry	0.99	75
Different region, related industry	1.03	74
Different region, unrelated industry	1.04	72

Table 5: Description of workers leaving the shipbuilding industry with employment t5 that stays within the same region and leaves for another region.

	1970-1995		**1970-1980**		**1985-1995**	
	Stay	***Leave***	***Stay***	***Leave***	***Stay***	***Leave***
rw_t0	0.99	1.03	0.99	1.03	0.99	1.03
Age1634	0.50	0.65	0.56	0.70	0.36	0.50
Age3549	0.38	0.30	0.34	0.26	0.48	0.41
Age5065	0.12	0.05	0.10	0.04	0.17	0.09
Academics	0.18	0.23	0.17	0.19	0.19	0.35
HigherEd_t5	0.06	0.09	0.07	0.09	0.06	0.09
Female	0.07	0.05	0.06	0.04	0.08	0.07
Family	0.55	0.48	0.57	0.51	0.50	0.38
N	*27,474*	*5,869*	*18,796*	*4,446*	*8,678*	*1,423*

Table 6: Multinominal logistic models on the likelihood of (A) still work in shipbuilding, and (C) not working, compared to leaving the industry for another job (B). Coefficients and cluster-robust standard errors at regional level (within brackets) are reported.

	7095A	**7095B**	**7080**	**8595**	**1970**	**1975**	**1980**	**1985**	**1990**	**1995**
A: Still in shipbuilding										
rw_t0		0.253***	0.264***	0.212***	0.061	0.384***	0.237***	0.422***	-0.242*	0.242*
		(0.028)	(0.033)	(0.058)	(0.058)	(0.047)	(0.076)	(0.077)	(0.126)	(0.126)
Age1634		-0.758***	-0.793***	-0.622***	-0.639***	-0.897***	-0.747***	-0.465***	-0.692***	-0.939***
		(0.017)	(0.019)	(0.036)	(0.038)	(0.028)	(0.035)	(0.051)	(0.077)	(0.082)
Age5065		0.356***	0.380***	0.291***	0.388***	0.262***	0.641***	0.350***	0.303***	0.252***
		(0.022)	(0.026)	(0.041)	(0.048)	(0.039)	(0.055)	(0.058)	(0.092)	(0.088)
Academics		0.037*	0.006	0.121***	0.188***	-0.052	-0.107**	0.311***	-0.195**	-0.368***
		(0.019)	(0.022)	(0.038)	(0.044)	(0.033)	(0.043)	(0.052)	(0.083)	(0.087)
HigherEd		-0.316***	-0.460***	0.128**	0.128*	-0.683***	-0.772***	-0.274**	-1.902***	0.169*
		(0.032)	(0.037)	(0.063)	(0.073)	(0.059)	(0.072)	(0.122)	(0.381)	(0.093)
Female		-0.155***	-0.319***	0.105*	-0.259**	-0.373***	-0.324***	0.327***	-0.123	-0.092
		(0.033)	(0.042)	(0.055)	(0.110)	(0.060)	(0.074)	(0.084)	(0.102)	(0.110)
LQshp	0.084***	0.082***	0.080***	0.078***	0.173***	0.123***	0.034***	-0.035***	0.218***	0.140***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.008)	(0.007)	(0.005)	(0.007)	(0.011)	(0.008)
LQrel	-1.245***	-1.291***	-1.593***	-0.786***	-1.737***	-1.945***	-1.672***	1.678***	-0.669***	-2.612***
	(0.037)	(0.038)	(0.048)	(0.062)	(0.069)	(0.090)	(0.117)	(0.161)	(0.092)	(0.164)
Unrel	0.239***	0.220***	0.277***	0.059***	0.491***	0.022	0.483***	-0.189***	-0.180***	0.553***
	(0.008)	(0.008)	(0.009)	(0.017)	(0.018)	(0.014)	(0.021)	(0.026)	(0.036)	(0.048)
Intercept	-0.624***	-0.324***	-0.639***	0.019	-3.274***	1.620***	-3.764***	-0.499*	3.471***	-3.959***
	(0.092)	(0.098)	(0.111)	(0.219)	(0.205)	(0.165)	(0.231)	(0.288)	(0.479)	(0.517)
B: Leaving for employment in new sector (baseline)										
C: Not Working										
rw_t0		0.516***	0.458***	0.914***	0.347***	0.231***	2.286***	0.507***	1.136***	1.708***
		(0.041)	(0.045)	(0.101)	(0.075)	(0.067)	(0.155)	(0.162)	(0.202)	(0.224)
Age1634		-0.180***	-0.188***	-0.299***	0.113*	-0.225***	-0.997***	-0.601***	-0.142	-0.374*
		(0.033)	(0.036)	(0.106)	(0.066)	(0.048)	(0.123)	(0.173)	(0.186)	(0.213)
Age5065		1.454***	1.519***	1.123***	1.043***	1.666***	1.713***	1.487***	0.734***	0.896***
		(0.035)	(0.039)	(0.094)	(0.074)	(0.053)	(0.107)	(0.127)	(0.196)	(0.211)
Academics		-0.558***	-0.674***	0.103	-0.789***	-0.624***	-0.922***	-0.372**	0.391**	-0.296
		(0.037)	(0.041)	(0.094)	(0.085)	(0.052)	(0.129)	(0.150)	(0.173)	(0.198)
HigherEd		-7.558***	-7.713***	-6.853*	-7.050**	-7.906***	-18.097**	-6.807	-7.294	-6.908
		(0.704)	(0.951)	(1.540)	(1.854)	(1.839)	(1.162)	(2.911)	(2.340)	(3.078)
Female		0.204***	0.259***	-0.319*	-0.673***	0.563***	-1.182***	-0.088	-0.382	-0.779**
		(0.061)	(0.066)	(0.167)	(0.212)	(0.075)	(0.364)	(0.272)	(0.270)	(0.342)
LQshp	0.076***	0.079***	0.080***	0.066***	0.149***	0.073***	0.120***	-0.026	0.186***	0.138***
	(0.005)	(0.006)	(0.007)	(0.012)	(0.013)	(0.010)	(0.017)	(0.021)	(0.026)	(0.021)
LQrel	-0.573***	-0.626***	-0.844***	-0.184	-1.031***	-0.703***	-0.088	0.781*	-0.165	-0.293
	(0.072)	(0.074)	(0.084)	(0.179)	(0.120)	(0.126)	(0.385)	(0.454)	(0.279)	(0.298)
Unrel	0.329***	0.331***	0.361***	0.281***	0.508***	0.175***	0.480***	0.182**	0.231**	0.170
	(0.015)	(0.015)	(0.017)	(0.050)	(0.031)	(0.021)	(0.066)	(0.074)	(0.100)	(0.109)
Intercept	-4.488***	-5.140***	-5.195***	-6.839***	-6.793***	-3.023***	-10.784***	-6.597***	-6.709***	-6.409***
	(0.174)	(0.184)	(0.194)	(0.646)	(0.354)	(0.253)	(0.793)	(0.856)	(1.367)	(1.376)
Time FE	Yes	Yes	Yes	No	No	No	No	No	No	No
LL	-76,943	-80,323	-61,859	-14,864	-17,546	-30,368	-12,930	-7,484	-3,448	-3,129
N	108,988	108,988	82,963	26,025	25,917	34,544	22,502	13,232	6,987	5,806

Table 7: Logistic models on relative wage increase (HigherInc=1) for workers leaving the region the entire period, pre- and post-crisis and for each year. Coefficients and cluster-robust standard errors at regional level (within brackets) are reported.

	7095A	**7095B**	**7080**	**8595**	**1970**	**1975**	**1980**	**1985**	**1990**	**1995**
rw_t0	-2.018***	-2.018***	-1.934***	-2.245***	-2.022***	-1.698***	-2.237***	-2.998***	-1.013***	-1.671***
	(0.053)	(0.053)	(0.063)	(0.097)	(0.119)	(0.091)	(0.124)	(0.135)	(0.193)	(0.202)
Age1634	-0.061**	-0.050*	-0.055	-0.063	-0.110	0.056	-0.149***	-0.139**	0.045	0.146
	(0.029)	(0.030)	(0.036)	(0.051)	(0.073)	(0.063)	(0.057)	(0.064)	(0.128)	(0.123)
Age5065	-0.246***	-0.254***	-0.472***	0.037	-0.007	-1.048***	-0.503***	0.080	0.303*	-0.148
	(0.044)	(0.044)	(0.058)	(0.069)	(0.100)	(0.103)	(0.101)	(0.089)	(0.172)	(0.149)
Academics	0.078**	0.067*	0.105**	0.001	0.379***	0.179**	-0.126*	-0.150*	0.495***	0.002
	(0.035)	(0.035)	(0.045)	(0.059)	(0.091)	(0.075)	(0.072)	(0.077)	(0.150)	(0.134)
HigherEd	0.473***	0.474***	0.514***	0.362***	0.757***	0.344***	0.595***	0.512***	0.587	0.295*
	(0.057)	(0.057)	(0.068)	(0.104)	(0.155)	(0.112)	(0.102)	(0.159)	(0.476)	(0.154)
Female	-0.002	0.017	-0.069	0.138	0.662***	-0.183*	-0.173	0.040	0.397**	-0.058
	(0.054)	(0.054)	(0.070)	(0.086)	(0.216)	(0.105)	(0.106)	(0.121)	(0.179)	(0.167)
NewReg	-0.109***									
	(0.035)									
SRegRel		0.243***	0.401***	-0.167*	0.245**	0.515***	0.352***	-0.242**	0.165	-0.096
		(0.047)	(0.056)	(0.089)	(0.109)	(0.097)	(0.090)	(0.119)	(0.214)	(0.186)
SRegDiff		0.059	0.086	-0.042	0.072	0.303*	-0.105	-0.263**	0.336*	0.301*
		(0.042)	(0.050)	(0.077)	(0.107)	(0.080)	(0.079)	(0.104)	(0.188)	(0.157)
ORegRel		0.022	0.091	-0.228	-0.157	0.118	0.338***	-0.066	0.333	-0.628**
		(0.066)	(0.075)	(0.148)	(0.134)	(0.133)	(0.127)	(0.221)	(0.358)	(0.257)
Unrel	0.023*	0.021*	0.020	0.040*	-0.028	0.087***	-0.007	0.075***	-0.044	0.037
	(0.013)	(0.013)	(0.015)	(0.022)	(0.029)	(0.026)	(0.027)	(0.027)	(0.058)	(0.054)
Intercept	2.739***	2.612***	2.498***	2.741***	3.104***	2.078***	3.191***	3.470***	1.790**	1.985***
	(0.159)	(0.160)	(0.195)	(0.285)	(0.363)	(0.323)	(0.338)	(0.359)	(0.752)	(0.668)
Time FE	Yes	Yes	Yes	Yes	No	No	No	No	No	No
LL	-17,408	-17,392	-11,747	-5,600	-2,918	-4,488	-4,253	-3,641	-869	-1,018
N	34,639	34,639	24,522	10,117	5,282	11,963	7,277	6,911	1,410	1,796

APPENDIX

Table A1: Variable definitions and descriptives

Variable	Definition	Mean	Min	Max
Dependent variables				
Status	Categorical variable on labour market status t_{+5}. Equals 1 if working in Shipyard industry, 2 if working in another industry and 3 if not being employed	1.70	1.00	3.00
HigherInc	Equals 1 if relative wage (see definition below) is higher in t_{+5} than in t_0 for workers not in shipbuilding in t_{+5}	0.74	0.00	1.00
Independent variables				
LQshp	Location quotient: Regional industry specialization (log)	4.21	0.01	14.12
LQrel	Location quotient: Regional related specialization (log)	1.01	0.21	3.78
Unrel	Number of workers in sectors other than shipbuilding or related industries (log)	11.72	9.22	13.80
NewReg	Dummy =1 if leaving shipbuilding and working in other region in t_{+5}	0.17	0.00	1.00
SRegRel	Dummy =1 if leaving shipbuilding and working in same region in skill-related industry in t_{+5}	0.24	0.00	1.00
SRegDiff	Dummy =1 if leaving shipbuilding and working in same region in unrelated industry in t_{+5}	0.57	0.00	1.00
ORegRel	Dummy =1 if leaving shipbuilding and working in other region in skill-related industry in t_{+5}	0.05	0.00	1.00
ORegDiff	Dummy =1 if leaving shipbuilding and working in other region in unrelated industry in t_{+5}	0.14	0.00	1.00
Controllers				
rw_t_0	Relative wage (observed/predicted income) in t_0	1.01	0.35	16.98
Age1634	Dummy =1 if age of worker is less than 34 years	0.41	0.00	1.00
Age3549	Dummy =1 if age of worker is between 35 and 49 (baseline)	0.36	0.00	1.00
Age5065	Dummy =1 if age of worker is 50 or above	0.23	0.00	1.00
Academics	Dummy =1 if worker has a Bachelors degree or has an occupation requiring at least 3 years university schooling.	0.17	0.00	1.00
HigherEd	Dummy =1 if worker completed an university diploma in t_{+5}	0.06	0.00	1.00
Female	Dummy =1 if worker is female	0.06	0.00	1.00

Table A2: Correlation matrix between variables included in regressions

	Status	HigherInc	rw_t_0	LQshp	LQrel	Unrel	NewReg	SRegRel	SRegDiff	ORegRel	Age1634	Age5065	Academics	HigherEd	Female
Status	1.00														
HigherInc	-0.10	1.00													
rw_t_0	-0.01	-0.20	1.00												
LQshp	-0.10	0.01	0.03	1.00											
LQrel	0.08	-0.01	0.01	-0.14	1.00										
Unrel	-0.02	0.00	0.01	-0.16	0.37	1.00									
NewReg	0.24	-0.03	0.03	0.01	-0.02	-0.07	1.00								
SRegRel	0.36	0.00	-0.02	-0.07	0.08	0.01	-0.10	1.00							
SRegDiff	0.69	-0.07	-0.02	-0.09	0.06	0.01	-0.17	-0.18	1.00						
ORegRel	0.16	-0.02	0.01	0.01	-0.02	-0.04	0.50	-0.05	-0.08	1.00					
Age1634	0.15	-0.01	0.00	-0.05	-0.04	-0.05	0.14	0.01	0.11	0.07	1.00				
Age5065	-0.08	-0.06	0.03	0.02	0.03	0.02	-0.09	-0.01	-0.06	-0.05	-0.38	1.00			
Academics	-0.04	0.01	-0.03	0.04	0.04	0.07	0.02	0.01	-0.07	0.00	-0.10	0.04	1.00		
HigherEd	0.01	0.02	0.12	0.06	0.00	0.00	0.03	0.00	0.00	0.01	0.03	-0.01	-0.13	1.00	
Female	0.03	0.00	0.00	0.02	0.05	0.01	-0.01	-0.02	0.06	-0.02	0.05	-0.07	-0.02	0.01	1.00