Do Initial Conditions Persist Between Firms? An Analysis of Firm-Entry Cohort Effects and Job Losers using Matched Employer-Employee Data[1]

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Abstract:

Influential studies have suggested that initial conditions can have persistent effects on workers' careers within firms. It is a longstanding question among economists whether such lasting wage differentials among firms and industries are due to persistent deviations of wages from workers' skills due to contracting and market frictions, or whether they arise from permanent differences among workers' skills. However, there is currently little representative evidence on firm-entry cohort effects and few explicit tests of alternative explanations. We use information on the universe of workers from a large German manufacturing sector from matched employer-employee records to show that firm-entry cohort effects are a pervasive phenomenon for the firms we study. The cohort effects we estimate are highly heterogeneous across firms and slowly fade over time. We also find that wage premiums on the past job are lost at job displacement, and that initial positive effects on wage levels at the new job fades over time. This suggests that at least part of firm-entry cohort effects arise from transitory rents, and that initial effects from previous wages fade as workers' search for better jobs.

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1. Introduction

Economists have long been interested in how persistent the effects of short-term unexpected shocks in the labor market are on workers' careers (e.g., Okun 1973). Using newly available longitudinal data, an increasing number of papers suggest that the starting conditions in the first year of a worker's job or labor market entry can indeed have log-term effects on earnings and career development (e.g., Oreopoulos, von Wachter, Heisz 2006, Oyer 2006, Kahn 2006). For example, Oreopoulos et al. (2006) find that the effect of graduating college in a recession fades after ten years for the typical worker, and has permanent negative effects for less-able graduates. While clearly a concern for policy makers and the public, such lasting effects of entry conditions are also difficult to explain in the context of standard models of wage setting and career development. In particular, they raise the question of whether wages persistently deviate from workers' skills because of market frictions or wage contracts.

This question has received particular attention in the context of cohort-effects within firms. A small but influential number of papers have argued that similar workers entering firms in different years receive permanently different wage profiles (Baker, Gibbs, and Holmstrom 1994, Beaudry and DiNardo 1991). Several approaches have been proposed to rationalize such persistent shifts in firms' wage structures. The first maintains that the degree of rent sharing between workers and firms varies with outside market conditions at the time of entry (Beaudry and DiNardo 1991). The second maintains that cohort effects arise from variation in the quality of jobs and career opportunities available within the firm (Okun 1973). If different jobs provide different

general experience or training provided by the firm, cohort effects can also arise from permanent changes in workers' skills (Gibbons and Waldman 2004).

Although these explanations have very different underlying views of wage determination, they have similar predictions for the degree of persistence of entry level conditions. Thus, it is difficult to distinguish among them based on cohort effects in earnings alone. However, these explanations have alternative implications for the persistence of entry level conditions as workers switch employers. While effects due to rent-sharing or job quality should fade for those workers losing their jobs, changes in skills should affect workers' wages even at new employers. Despite offering clear predictions, these hypotheses have not been tested, in part because data used in existing work had little information on workers' job mobility and their employers.

More generally, since existing studies focused on single firms (Baker, Gibbs, and Holmstrom 1994) or particular time periods (Beaudry and DiNardo 1991), at present little is known about whether firm-entry cohort effects are a pervasive phenomenon in the wider labor market. Given the degree of heterogeneity in other aspects of firms' wage structures (Abowd and Kramarz 1999), and given the amount of heterogeneity in firm growth rates (Davis and Haltiwanger 1992) it is conceivable that firm-entry cohort effects are a widespread phenomenon that affects firms to different degrees. However, until now little information is available on how pervasive such cohort effects are.

In this chapter, we provide three contributions to the present literature. First, we use data on the complete career histories of all workers in a large German manufacturing sector to describe the prevalence and heterogeneity of firm-entry cohort effects for a large sample of firms over more than 20 years. To ensure the cohort differences in wages we

find are not due to selective entry of workers into firms, the nature of our data allows us to control for observable firm and worker characteristics as well as worker fixed effects. In addition, the long time horizon allows us to examine whether entry-conditions fade within firms, and whether firms' wages tend to converge to a common market wage over time.

Second, we exploit the predictions of the alternative models for the impact of job loss on wages to learn more about the sources of firm-entry cohort effects. To do so, we complement the descriptive analysis with a study of the effects of job displacement on wage changes for workers with high, medium, or low starting wages at the lost job. Thereby, we are particularly interested in whether wage premiums fade upon job loss, and whether workers recover some of their past advantages with time since job loss.

Third, we analyze the effect of past wage premiums on the *level* of wages after job loss. Since controlling for observable characteristics past wages are partly a function of unobserved ability, we would expect a positive correlation. However, if the ability of job losers is not observed perfectly by the market, temporary wage premiums may also serve as a temporary signal that fades over time. If on the other hand wage premiums are driven by permanent skill differences, we would expect their effect to be stable or increasing.

We find that in the manufacturing sector we study, firm-entry cohort effects are a significant phenomenon. Similar firms pay different wages to similar workers starting their jobs at different points in time. However, we also find that this is not simply a homogeneous market wide phenomenon – there is considerable heterogeneity between firms and between cohorts in the incidence and strength of cohort effects. A further key

result is that in our sample entry-level differences in wages fade within firms, and there appears convergence to a market wage, but reversion is very slow. Thus, wage differences between cohorts of similar workers are highly persistent but not permanent.

We also find that workers with high starting wages have higher and persistent wage losses at job loss; workers with relatively low starting wages on the other hand seem to gain from losing their job. Thus, part of initial wage differences appears to be temporary firm-specific rents. Moreover, there appears to be mean reversion at job loss. However, markets do not seem to be able to fully tell apart ability from rents in the short run, and past wage advantages carry a premium for the level of wage after job loss that fades over time.

These results suggest that firm-entry cohort effects at least in part consist of time varying differences in rent sharing or job quality. Clearly, part of the effects we find may also arise due to the presence of other individual specific rents, for example from job search. Future research based on a larger sample of firms and workers able to explicitly analyze the persistence of cohort-effects at job loss will help to shed light on this question. The results also suggest that characteristics of the previous job, such as job tenure or past wages, are not just a fixed measure of worker quality, as suggested in the prior literature (e.g., Kletzer 1989) but also appear to influence temporary wage components. Among others, this could arise if previous job characteristics affect workers' reservation wages. The effect of these initial conditions fades, consistent with the notion of continued on-the-job search. In addition, previous job characteristics may function as temporary signals of workers' skills.[2]

[2] However, in that case the effect of the initial signal should not fade over time (Farber and Gibbons 1996, Altonji and Pierret 2001).

The outline of the chapter is as follows. First, we give a brief overview of the conceptual background, the empirical approach, and the data we use. Second, we describe the prevalence of cohort effects in a sample of large and stable manufacturing firms. Third, we analyze the effect of past starting wages on the extent of wage changes at job displacement. Fourth, we study the effect of the starting wage on the lost job on the level of ensuing wages. The last section concludes and offers suggestions for future research.

2. Conceptual Approach

There are two basic explanations for the persistence of differences in starting wages of workers entering the same firm at different moments in time. The first view suggests that wages contain firm-specific components that can differ across entry-cohorts but that are lost as workers move between firms. This may arise due to differences in the degree of rent sharing among workers and firms, for example due to the degree of pressure in the outside labor market. Or it may arise to the presence of long-term implicit insurance contracts (Beaudry and DiNardo 1991). Alternatively, this may be due to variation in the quality of jobs offered within firms over time (Okun 1973). For example, in periods of high growth firms may offer more jobs that pay more, either because of higher productivity or due to higher incentive wages. Persistent differences may also arise if some jobs provide higher accumulation of firm specific-skills.

These alternative sources of wage differentials have the similar implication that the wage advantages they may imply for certain cohorts are lost if workers leave the firm. Since voluntary movers may not leave their job if compensated for giving up of these wage premia, the loss is likely to be visible only for workers who move their job

involuntarily. Thus, we would expect wage losses for those job losers to be largest that had the highest wage premiums. For these displaced workers, we would expect to see mean reversion; i.e., those workers with below average cohort-wages experience wage gains relative to those workers with above average cohort-wages as absent any skill differentials both groups draw again wages from the same market wage distribution.

Since the workers with below average cohort-wages could have obtained higher wages on the outside market, some mobility friction must prevent them from moving jobs. Since cohort-effects are likely to be more typically in large firms with longer job attachment, this is likely to arise due to the presence of average wage premiums large firms pay (Oi and Idson 1999). Nevertheless, we would expect that on average workers with below average cohort-wages are more like to switch employers. Similarly, firms may face an incentive to fire workers with above-average wages if these are due to a higher amount of rents.

The second broad view suggests firm-entry cohort effects arise from changes in workers' general skill level. This may occur if in some periods firms offer a larger amount of jobs with high a degree of experience accumulation or general training (Gibbons and Waldman 2004). In this case, differential entry-level conditions reflect actual differences in workers' skill levels and can arise even in an environment where each worker is paid his marginal product. This is in contrast with the first set of explanations, that each suggested that workers with similar skills would be paid different wages, either because of rent sharing or differences in job quality.

Clearly, the second view suggests that even workers losing their job involuntarily will maintain their wage advantage on their new job at least in the medium run. While in

the years immediately following the job loss some of the advantage may be lost as workers have to find a new job match or as the market may be uncertain about workers' ability, in the medium run workers should again obtain a wage that reflects their higher (or lower) marginal product. This stands in contrast to the implications of the first view, in which all cohort-wage differences should be lost at job loss. In particular, even if past wages may serve as a positive signal for ability in the years immediately after job loss, the effect of past cohort conditions should fade with time since job loss – the opposite implication as from the second view.

The existing empirical literature does not address the question of persistence of conditions on the past job for workers switching employers. One strand of literatures aims at characterizing the presence of firm-entry cohort effects, but pays little attention as to what happens when workers leave firms. In this vein, Baker, Gibbs, and Holmstrom (1994) analyze the role of cohort effects within a single firm. Beaudry and DiNardo (1991) use data from the Current Population Survey (CPS) and Panel Study of Income Dynamics (PSID) to analyze the effect of labor market conditions on workers' wages as they stay within the firm. Neither paper analyzes the persistence of the wage effect it finds as workers move between firms, mostly due to a lack of data.

Another strand of literature examines the extent and determinants of wage changes at job loss in detail, but typically pays less attention to the role of past job characteristics.[3] The only important exception is the role of past job tenure. Since there is no market for firm-worker specific skills or match rents, the wage gradient with job tenure can be seen as a form of rent sharing between workers and firms. A worker losing

[3] Past industry, occupation, and firm size are an exception. See for example Ruhm (1991), Jacobson, Lalonde, and Sullivan (1993), Gibbons and Katz (1991), or Farber (1997, 2003). For a survey of this literature see Farber (1999).

his job should then lose these firm-specific rents. This is what the literature has found, and the effect appears to be particularly strong for a loss in industry tenure (Neal 1995, Parent 2000).

In this context, Kletzer (1989) has found that workers with higher past job tenure have higher wages on the job after job loss. This may signify that workers with high job tenure are also of high ability, i.e., positive wage tenure profiles in part reflect ability differences between high and low tenured workers.[4] A similar argument holds for the effect of the initial wage on the lost job. Even conditional on observable characteristics – such as age and education – past starting wages will be a function of unobserved worker ability, and will thus positively correlate with wages on the current job.

However, past tenure and earnings may also influence workers' reservation wages. In this case, high past wages may lead workers to search for jobs more intensely. If this is the case, there is again an initial correlation of past job characteristics and initial earnings after layoffs. Over time, these workers' wages are again determined by market conditions (workers' skill levels and the overall wage distribution), thus the effect of the reservation wage would be expected to fade.

In addition, if the market observes workers' ability only imperfectly it may use past job tenure or past wages as signals to infer about their productivity (Farber and Gibbons 1996, Altonji and Pierret 2001). In this case, part of the positive effect of past job tenure may be due to an initial signaling effect. However, this effect should not fade over time even if markets learn about workers' ability.

[4] This idea is also exploited in Abraham and Farber (1987), who use completed job tenure as an indicator for the quality of a job match to correct for selection bias in estimates of the return to job tenure.

If on the other hand firm-entry cohort effects are due to differential skill accumulation, we should observe the opposite phenomenon. Initially, some of the higher skill embodied in the cohort-effect may be discounted if displaced workers receive a wage based on average skills. Over time, as markets learn about workers' true ability, we would expect the effect of past wages to remain stable, or least not to decline further.

3. Empirical Approach

The analysis of the chapter consists of two parts, each based on a different sample of firms. The first, descriptive part of the paper studies the importance of firm-entry cohort effects for a sample of large stable firms in car manufacturing sector in Germany. The second part analyzes wage changes and wage levels of job losers using the complete available career histories of all workers who ever worked in German car manufacturing. The data is drawn from the German employee registry that records complete career information as well as basic demographics for the universe of German workers covered by social security and their employers from 1975 to 2003 and is further described below.

The goal of the first part of the paper is to describe the incidence, heterogeneity, and persistence of firm-entry cohort effects within a large but specific sector of the economy. The focus on a single sector allows us to exclude wage differences arising from differential industry trends or business cycles. To study the magnitude and evolution of average cohort wages, we concentrated our analysis on stable establishments with a large enough rate of inflow of new workers in every period. For each of the 55 firms that survive our selection criteria further described below, we estimate cohort effects following the approach in Baker, Gibbs, and Holmstrom (1994) (henceforth BGH). To do so, we proceed in three steps. First, we collapse our data to the level of firm-tenure-entry

year cells. Second, we use the cell level averages to run the following wage regression at the firm level.

$$\overline{\log w}_{fct} = \alpha_f + g_f(ten) + \lambda_{ft} + \phi_{cf} + \beta_f \overline{X}_{fct} + u_{fct} \quad (1)$$

This modeling approach allows for a firm-specific quartic tenure profile ($g_f(t)$), a constant and year effects, as well as for firm-specific effects of average entry cohort characteristics. Third, we regress the estimated firm-entry cohort effects (ϕ_{cf}) on a firm specific trend and treat the residual from that regression as cohort effects for the remainder of our study. As explained in BGH, in the presence of year and tenure effects, one cannot identify the linear component of the cohort effect. Since we are mainly interested in examining the presence and significance of cohort effects, the chosen approach suffices for our purposes.

In addition to including average observable characteristics at the cohort level, we also ran the model in Equation 1 at the individual level and included worker fixed effects. Unlike in the case of BGH who only had access to data on all workers at a single firm, this is possible in our case since we have the entire career information of workers who ever worked at each of our firms. This further alleviates the concern that the cohort effects identified in Equation 1 may still be due to selective entry of workers of different skill levels.

An important aspect of firm-entry cohort effects is their persistence – do differences in entry level wages last unfettered forever, as found in the firm analyzed by BGH, or does convergence take place? Convergence may be of two kinds. First, high

wage cohorts may converge to the average wage level within the firm. In this case, the relevant benchmark and speed of convergence is determined by the firm-level average. Second, high wage cohorts may converge to a market level wage. I.e., reversion of high initial starting wages may be faster if they are high relative to the overall market wage.

To examine the extent and speed of reversion of initial wage differences, we modify the above model and estimate the following regression for each firm in our sample of large stable firms

$$\overline{\log w}_{fct} = \alpha_f + g_f(ten) + \lambda_{ft} + \beta_f \overline{X}_{fct} + \phi_{cf0} + h_f(ten)\phi_{cf1} + u_{fct} \qquad (2)$$

Thereby, ϕ_{cf0} measures the difference in initial starting wages for entry cohort *c*, and ϕ_{cf1} measures the firm-specific rate of decay of the initial effect. We experimented with linear, quartic, and unrestricted specifications for the decay function $h_f(t)$, and found a linear specification works astonishingly well for the most relevant time horizon of about ten years of job tenure.

The second part of the paper studies the effect of starting wages on the effect of job displacements. Once we have identified displacement events and an appropriate estimation methodology, the analysis is relatively straightforward. In particular, we are interested whether wage losses at job displacement differ by the level of the starting wage at the previous job. Ideally, we would have analyzed the effect of firm-entry cohort effects themselves on the extent of wage loss for workers losing their jobs from our sample of large and stable firms. However, for the sector in question the sample of such workers was too small for a meaningful analysis.

Thus, in the second part of the paper, we analyze the effect of a job displacement on wage changes and post-job loss wage levels for all workers who worked in German car manufacturing at some point between 1975 and 2003. We define a displaced worker to be a worker who had at least three (or five) years of tenure at a given firm, and who had at least 30 days of unemployment following the job move. We experimented with alternative definitions based on mass-layoffs at the establishment level, but again found that we had too few workers affected by such events in our sample.[5]

We then study the wage change of displaced workers relative to the wage held prior to job loss for up to fifteen years after the job change. Specifically, the basic model we estimate at the individual level is

$$\log w_{it} = \alpha_i + \sum_{k\geq -3}^{15} D_{it}^k \delta_k + g(\exp_{it}) + \lambda_t + u_{it} \qquad (3)$$

where the dummies D_{ik} indicate whether a year is *k* periods before or after a job loss and *y* stands for calendar year. This estimates the effect of wage changes at job loss controlling for a quartic polynomial in potential labor market experience, unrestricted year effects, and worker fixed effects. This model essentially extends Farber's estimates based on the Displaced Worker Survey (DWS) Supplement to the CPS into an analysis covering several periods after the job loss. In particular, this approach does not keep a control group of workers who did not lose their job, and thus differs from the estimation method implemented by Bender, Dustman, Margolis, and Meghir (2002) for Germany

[5] In separate work using the German Socio-Economic Panel, Goerlitz and von Wachter (2006) find that while imposing unemployment does tend to raise the estimated impact of job losses relative to self-reported layoff status, the difference is reduced significantly when worker fixed effects are included.

based on Jacobson, Lalonde, and Sullivan (1993). Instead, the year effects in this sample are identified from the baseline period of workers later experiencing displacement.[6]

The main estimates we are interested in are estimates of the earnings loss by groups of workers with low, medium, and high starting wages relative to their average wage. Thus, we re-estimate the model in Equation 3 interacting the time effect as well as the displacement-time effects with dummies for whether a worker's starting wage at the lost job was in the bottom, middle, or top of the wage distribution (we choose the inter-quartile range as cut off points). This results in the following model for estimation

$$\log w_{it} = \alpha_i + \sum_{k\geq -3}^{15} D_{it}^{k,Low}\delta_k^{Low} + \sum_{k\geq -3}^{15} D_{it}^{k,Med}\delta_k^{Med} + \sum_{k\geq -3}^{15} D_{it}^{k,High}\delta_k^{High} + \lambda_t^{Low} + \lambda_t^{Medium} + \lambda_t^{High} + g(\exp_{it}) + u_{it} \quad (4)$$

The estimates of this model show the wage changes by groups of workers with different starting wages relative to their *own* group-specific wage at the time of job loss.

In future work, we plan to include 'stayers' – workers who did not lose their job – in the model as a control group to replicate the classic event study design introduced by Jacobson, Lalonde, and Sullivan (1993). We will also analyze wage losses by other worker characteristics such as education, age, or past job tenure. Similarly, we can exploit further prediction regarding the effect of past job characteristics on the wage changes of voluntary movers.

[6] To identify the worker fixed effects, we have to exclude on pre-period dummy. To identify the year effects, we have to exclude one additional dummy. Thus, we keep observations on workers up to five years prior to displacement, and include dummies for up to three years prior to displacement.

The last set of models we estimate regress the *level* of log wages after job loss. To do so, we begin by implementing the models estimated by Kletzer (1989) who concentrates on the effect of past job tenure. We first augment Kletzer's model with the effect of past starting wages. Then we extend her approach and interact past job tenure and past starting wages with time since job loss. Thus, we are interested in the coefficients on the interactions with time since job loss in the following model

$$\log w_{it} = \alpha + \beta_0 \log w_{i0}^{LostJob} + \beta_1 \tau \log w_{i0}^{LostJob} + \gamma X_i + g(\exp_{it}) + \lambda_t + \varepsilon_{it} \qquad (5)$$

where τ stands fort the years since job loss. This model is only estimated based on observations after a job loss. The important extension of Kletzer's model is made possible by the availability of longer time series in our data, and allows us to study to what extent the immediate effect of past job and worker characteristics on wages post-job loss fades over time. Alternatively, we will be able to see whether past wages are driven by components of actual or predicted worker skill whose effect stays stable.

4. Administrative Longitudinal Matched Data

The data used in this chapter are drawn from the German employment register containing information on all employees covered by social security, representing around 80 percent of the German workforce.[7] The employment register takes stock of existing employees at each establishment twice a year. Since the notification procedure for social

[7] An overview of the data is given in Bender et al. (2000), a more detailed description can be found in Bender et al. (1996). For further information and citations as well as accessibility see www.research-data-center.de. Coverage includes full- and part-time employees of private enterprises, apprentices, and other trainees, as well as temporarily suspended employment relationships. The self-employed, civil servants, and students are excluded.

security also requires employers to record any permanent or temporary change of employment relationships, the employment register contains detailed histories for each worker's time in covered employment. The main information contained in the register for administrative purposes (and therefore the most reliable) are gross daily wages subject to social security contributions and the exact periods during which the employee worked in the social security system. In addition, the data contain basic demographic information as well as information on occupation, industry, job-status, and education.[8] Most important for the present purpose, the data also contain unique establishment identifiers. These were used to create a separate data set of establishment characteristics that were aggregated up from the employment register and merged back onto the individual level data. Characteristics include among others establishment size, employment growth, and average wages. The relevant entity throughout the empirical analysis is the establishment. Despite the inaccuracy it entails in some cases, we will keep using the terms establishment and firm interchangeably for the rest of the analysis.[9]

The sample used for this chapter consists of information on the universe of workers and establishments from the West German car manufacturing sector. In a first step we selected all employees who worked at least one day between 1975 and 2003 in an establishment of this sector (a total of 162,332 establishments). To ensure that the sample is consistent in time, we chose only those notifications where the employees worked part- or fulltime. We dropped apprentices from the main analysis to avoid confounding job changes at end of apprenticeship with regular job displacement and to be consistent with

[8] The entity reporting is the establishment for which an employee works and can thus change over time. This can lead to mistakes in the coding of some demographic variables (e.g., nationality or marital status) and in particular education (which tends to reflect required rather than actual qualification).
[9] Unfortunately, it is currently not possible to link establishments that belong to a common parent firm.

the concept of firm-entry cohort effect typically analyzed in the literature. We also dropped workers with missing education and who are younger than 21 and older than 64.

Using this sample we aggregated up the individual level information into a cell-level data set at the establishment, year, and entry cohort level that contains the size of each entering cohort in each year at the firm, as well as average earnings and basic average demographic characteristics (such as average age, average education, or fraction female). To obtain a meaningful basis for the descriptive analysis of firm-entry cohort effects, from this cell-level data set we extracted a subset of firms that had a sufficiently large inflow of workers each year for an extended period of time. In particular, we required firms to have at least ten entering cohorts with at least ten employees, at least a hundred employees over ten years, and at least 21 entering cohorts. This leaves us with a total number of 55 firms. This restriction ensures both a reasonable sample of firms as well as a meaningful base for calculation of a large number of firm-entry cohort effects. We have experimented with the cut-off points, without a noticeable difference in results. In addition, to ensure we observe each cohort for an extended amount of time we only consider cohorts entering before 1997.

For the displacement analysis, we selected from our sample of car manufacturing all workers with at least three years of tenure who changed employers and who spend at least thirty days in unemployment after moving. For this sample, we only kept observations that were at least five years before and at most 15 years after the job loss.

5. Empirical Results

5.1. Firm-Entry Cohort Effects in German Car Manufacturing

To illustrate our main descriptive results, we begin by showing the pattern of firm-entry cohort effects for a single large and stable establishment in the car manufacturing sector.[10] Figure 1A shows the development of average log real daily wages for bi-annual entry cohorts ranging from 1976 to 1996. One can clearly see a rising trend and significant fluctuations in entry wages over time. More importantly, the difference in entry wages clearly leads to persistent average wage differences across cohorts. However, the figure also clearly shows a pattern of reversion. Differences in initial wages appear to fade over time.

These patterns are documented explicitly in Figure 1B that shows the annual entry-cohort effects obtained by estimating Equation 1 and de-trending the resulting cohort-effects. One can clearly see permanent differences in average wages of different firm-entry cohorts. Controlling for observable characteristics reduces the cohort effects only somewhat. This suggests that when the firm pays higher wages it attracts more able workers. However, if we instead control for worker fixed effects the cohort wage differences seem to rise, leaving us with no clear conclusion regarding selective entry between cohorts. In either case, we find there are robust differences in average cohort wages over time in this large manufacturing firm, as suggested by Baker, Gibbs, and Holmstrom (1994) for a large financial service firm.

However, contrary to the finding in BGH, the pattern in the figure also shows that average cohort differences in wages are smaller than differences in average *starting* wages between firm-entry cohorts. Figure 2 shows the time pattern of reversion of initial wage differences explicitly for different specifications of the decay function. Unlike

[10] For data protection reasons we have added random constant with zero mean to the individual wage levels.

BGH, we find a significant albeit slow decay of initial wage differences that lasts up to twenty years. Perhaps not surprisingly, we find a concave tenure wage-profile (the profile in BGH's firm was linear). The pattern of decay we find is approximately linear.

The key question then is to what extent the result of statistically and numerically significant firm-entry cohort effects hold for a wider sample of firms as well. The answer to this question is affirmative. We ran the model in Equation 1 separately for each firm in our sample of 55 large and stable car manufacturing firms, and de-trended each set of cohort effects as described in Section 3. The distribution of estimated cohort effects for all firms is shown in Figure 3 and Table 2. Panel A and B of Figure 4 show the distribution of the reversion of initial wage differences.

Overall, we obtain five core results.

1. There are significant cohort effects for each firm in the industry we study that are robust to controls for worker and firm characteristics. Similar workers entering firms at different times earn different wages.
2. There is considerable heterogeneity of cohort effects between firms. The entry cohort effects cannot be simply driven by overall labor market conditions in the industry.
3. Heterogeneity in cohort effects (both within and between firms) is increasing over time. The spreading of the German wage distribution occurs in part through cohort effects.
4. Cohort wage differences are largest for entry level wages and converge over time *within* firms. However, convergence *within* firms is slow, such that persistent differences in average wages remain.

5. Reversion of wages is faster the farther average cohort wages are from the overall market. Outliers tend to convergence *between* firms as well.

The distribution of cohort effects with and without worker characteristics is shown in Table 2 for the full sample and each of the three decades of our sample. The distribution of F-statistics or p-values is omitted since all cohort effects are significant at the one percent confidence level. The table also shows the distribution of average entry-level wages with and without worker controls. The results suggest that there are important and significant differences in average wages of firm-entry cohorts that are robust to controls for average worker characteristics.

The typical de-trended cohort effect lies within plus and minus five percent of average firm wages. Taken at face value, they suggest that some cohorts in some firms carry premiums or discounts on the order of five percent, which corresponds to the wage effect of about one year of labor market experience or a year of education in Germany. Given we cannot identify the linear component of cohort effects, care should be taken with interpreting the specific magnitudes.

The average differences in cohort effects mask even bigger differences in average starting wages between cohorts. Comparing Figures 3A and 3B, one can see that the distribution of deviations of cohorts' starting wages from firm specific averages has fatter tails. Again, although most of the differences are limited in magnitude, some cohorts experience large differences in average wages.

The distribution of cohort effect arises from differences between cohorts within firms. However, a large part of the variation arises from variation between firms for any given cohort. This is apparent from the fact that it holds within decades, and can be

shown to hold within single years as well. In fact, the annual distribution of cohort effects is similar to the decade-wide distribution, suggesting that an important part of the variation is coming from between firms. Thus, firm-entry cohort effects cannot be simply explained by business cycle pressures affecting the entire industry. It may be that within the industry firms producing different products (say trucks or passenger cars) or goods of different qualities face differential demand conditions.

In addition, there may be truly firm-specific differences in the evolution of productivity, employment, and output that affect the fortunes of workers entering firms at different points in time. That similar firms within sectors can experience vastly heterogeneous patterns of employment growth has been suggested in the literature before (e.g., Davis and Haltiwanger 1992). Our findings suggest that such differences can lead to differences in entry wage levels and average wages between entry cohorts *and* between firms.

Interestingly, the numbers in the tables and figures suggest that the distribution of entry wage differences and cohort effects has been widening over time. The increasing spread is consistent with a widening in the German wage distribution in the 1990s after a period of relative stability. Our results suggest that part of the recent widening is due to an increasing spread in entry wage differences. However, our results also suggest that this pattern had already started in the 1980s, something typically not found in analyses of the overall wage distribution.

Figure 4A shows the distribution of the fraction of the initial difference in average starting wages decayed at each tenure year. The figure suggests first, that the median rate of decay is very slow, leading to a half-life at about eight to nine years. Second, the figure

shows that the speed of decay varies widely between firms. For the bottom decile the entry wage difference fades within three to four years, for the top ten percent the effect actually increases over time. Convergence does not only occur within firms. Figure 4B shows that cohorts that have high average wages relative to the overall market have faster speed of convergence. Thus, convergence also occurs between firms towards the average wage in the market.

Overall, these results suggest that firm-entry cohort effects are a significant phenomenon in a broad sample of large and stable manufacturing firms even when controlling for worker characteristics. There is substantial heterogeneity in cohort effects between firms. Convergence within and between firms occurs but is slow. These preliminary estimates suggest that firms wage structures have a component that systematically varies over time and differs between firms. Our documentation of this *dynamic* component complements and extends existing characterizations of *static* differences in average wages, tenure-wage profiles, and the variance of wages (e.g., Abowd and Kramarz 1999, Abowd, Corbel, and Kramarz 2002, Margolis 1995).

These results also underline the importance of efforts to understand the empirical sources of firm-entry cohort effects and their theoretical underpinnings. The descriptive results in the previous section allow no clear interpretation with respect to the source of cohort effects. On the one hand, the fact that initial wage differences fade suggests that they must have at least in part been driven by temporary differences in cohort-specific rents or job quality. However, the high degree of persistence does not exclude that some of the effect is driven by lasting differences in workers' skill levels. This underscores the

need of an explicit test of potential explanations that goes beyond purely descriptive study of wage differences themselves.

5.2. Job Losses and Differences in Starting Wages

As discussed at the outset, if differences in cohort wages arise due to differences in temporary rent or job quality, they should fade if workers lose their job. Alternatively, if cohorts obtain different degree of training or experience, they should carry their higher skills over to their new job. As discussed at the outset, we study this question by comparing the wage losses of job losers with high or low starting wages at the lost job. The analysis of losses in cohort effects per se is left for future work with a larger sample of firms and workers.

As a first step, Table 3 shows the overall effects of job displacements on wage changes. The time pattern before and after job loss is shown with standard error bands in Figure 5. The results indicate significant and large wage losses of about ten percent in the first year that fade in about six to seven years. These results are quite similar to estimates of the effect of job loss in the U.S. based on the DWS (e.g., Farber 1997, 2003), and similar to estimates in Couch (2001) using a similar methodology and the German Socio Economic Panel (GSOEP). Burda and Mertens (2001) confirm that high-wage job losers in Germany can experience very large and persistent earnings losses. They also find that job losers in the bottom quartile of the wage distribution tend to exhibit significant gains from job loss.[11]

[11] Burda and Euwal's (2001) estimates imply lower increases at the bottom and higher losses at the top. They do not focus on past starting wages, however, and have a somewhat different definition of layoff. For they top, they demonstrate that including recalls, as we do here, may underestimate the effect of job loss.

Our estimates are a larger and more persistent than a recent study of plant closings in Germany using the same administrative data source (Bender et al. 2002). These differences may arise partly due to differences in the definition of job loss, the estimation methodology, the sample used, and the time period covered. In particular, since we impose thirty days in unemployment to identify displaced workers, our approach may lead us to partially overstate the effect of job displacement. Part of the differences may also be due to our focus on workers losing their job in car manufacturing. Since the car manufacturing sector is typically a high-wage sector, part of the losses we observe are due to losses in the industry wage premium.

Table 3 also shows corresponding estimates for workers that had five years of pre-displacement tenure, and for workers exiting the large and stable firms analyzed in the first part of the chapter. As expected, higher tenure workers experience large and more persistent wage losses. However, the wage losses of workers leaving large firms are much larger. As found in von Wachter and Bender (2006), workers leaving large firms permanently lose rents associated with jobs at large employers and never fully recover from the initial wage loss.[12]

The remainder of the section analyzes job displacement effects by previous starting wages on wage loss and post-loss wage levels. We obtain four key results.

1. There appears to be mean reversion. In particular, we find large differences in the degree of wage loss by previous starting wages, with the bottom gaining and the top losing.

[12] Large firms appear to provide an exceptional career environment that is permanently lost upon job displacement since on average workers will transit to a smaller firm. Von Wachter and Bender (2006) show that only apprentices who get displaced from large training firms suffer permanent losses in earnings relative to workers staying at the firm at the end of training. Once they control for the change in firm size at job loss, this excess loss disappears.

2. There are permanent winners and losers from job loss. Those workers with high past starting wages experience permanent losses, whereas those with low starting wages experience long term gains.
3. Pre-job loss starting wage and job tenure have significant positive impact on wage levels after job loss. As expected, there is positive selection into high tenure and high past starting wages.
4. The effect of pre-job loss tenure and starting wage partly fades with time since job loss. These variables appear to serve as initial signal to the market of worker quality after a job loss.

Table 3 and Figure 6 show the estimates of percent wages lost at job loss for workers with high, medium, and low starting wages (based on the inter-quartile range of log real starting wages at the previous job). Clearly, workers in the high and medium starting wage groups suffer large and persistent losses, and seem to drive the overall effect shown in Figure 5. Thereby, the medium group tends to recover after ten years, whereas workers in the high group suffer permanent earnings losses of more than ten percent. The group of workers with the smallest starting wages on the other hand has substantial benefits from the job loss that increase over time.

These results suggest that starting wages contain firm-specific rents that fade upon job loss. The results also suggest that there is mean reversion in the labor market. This is consistent with a model of job search in which at job loss workers come from a different part of the wage distribution, but after job loss they are again ‘reset’ to the mean of the wage distribution irrespective of their previous position. Note that we would not

expect to see the effect of previous wages fade fully, since they are likely to contain some information on workers' ability even beyond a fixed person effect.

5.3. The Determinants of Post-Job Loss Wage Levels

To explore this aspect further, Table 4 analyzes the effect of pre-job loss characteristics on the level of log real wages after job loss. Thereby, the focus is particularly on the change in the effect of these characteristics over time, since this may further help discern the sources of persistence in the effect of initial conditions.

We first replicate Kletzer's (1989) basic model that includes previous job tenure as basic additional control in a standard human capital model of log wages. We confirm Kletzer's result that past job tenure has a positive effect on current wage levels; in fact, despite the different definition of job loss, our point estimates are quite similar to hers. As in her case, this suggests that the positive correlation of tenure and wages not only arises from specific skills, but also from the fact that high tenured workers are likely to be more able workers. The next column in Table 4 also adds the log of previous starting wages to the Kletzer's regression model. Again, we would expect past wages to have a positive effect on current wages as they are a function of components of workers' skills not captured by observable characteristics. This is what we find – a 15% difference in starting wages raises wages past layoff by about one percent.

In addition to being correlated with actual worker skills, part of the initial effect of past job tenure or past wages may be only temporary. To address this question, the last two columns of Table 4 show estimates from regression models that interact characteristics of the past job with time since job displacement. Column 3 shows the

estimates for past job tenure. When the interaction with past job loss is included the initial effect doubles, and there is a clear pattern of decay. Thus, the estimates in Column 1 capture the average effect of past job tenure all the years prior to job loss, and obscure the fact that the effect fades over time. However, the effect does not fade completely even after ten years after job loss, suggesting, perhaps not surprisingly, that there is still an important correlation between past job tenure and unobserved worker skill.

A similar pattern holds when past starting wages and their interaction with time since job loss are included in the model. The effect of past wages is initially larger and shows a linear pattern of decay (the estimates were not improved by including interactions with higher order polynomials of time since displacement). Again, the effect does not completely fade, suggesting that conditional on observable characteristics past wages do contain information on workers' productivity. However, after ten years over 80% of the initial effect is gone.

These results appear to be consistent with the hypothesis that the initial effect of past tenure and past starting wages captures temporary increases in reservation wages. Over time, reservation wages are determined by current market conditions, and the effect of past rents fades. In addition, as workers continue searching for jobs, their wage is again determined by their skills and overall wage distribution.

Overall, we find that past starting wages contain firm specific components of earnings that are partly lost when workers are displaced. These components may contain both group level effects, such as firm-entry cohort effects or average firm-wage premiums, as well as individual specific rents, for example from job search. In future work, we plan to use displaced workers from a larger sample to distinguish between these

different components. We also find that not all of the effect of past earnings is lost immediately. Some of the past wage may affect reservation wages and search efforts and fades only slowly over time as workers continue to search for jobs. Concluding, the benefit of getting a high paying job is mostly relegated to that job, but has positive spill over effects to future jobs that persist for up to ten years past a job loss.

6. Summary and Conclusion

Persistence of entry-conditions within firms has intrigued economists for a long time, but few studies were able to provide comprehensive empirical evidence on the incidence and causes of such cohort effects. In this chapter, we have used administrative information on wages and career patterns for all workers who ever worked in the German car industry matched to information on their establishments to make two contributions to the literature. First, we describe the incidence and size of firm-entry cohort effects for a large sample of firms. This allows us to study both the heterogeneity of cohort-effects across our industry as well as their persistence both within and between firms.

Second, we have begun to analyze the sources of persistent wage-differences between different entry cohorts within firms. In particular, we have analyzed whether initial wage advantages are lost when workers lose their job and spend some time in unemployment. If initial wage differences are driven by differences in general human capital, they should persist when workers are forced to move to new jobs. If they are driven by firm-specific wage components, initial advantages should be lost at a job loss. To probe the degree of persistence of characteristics on the previous job further, we also

analyzed the effect of past job tenure and previous starting wages on the level of wages after the job loss.

We find that firm-entry cohort effects are a common phenomenon among larger and stable firms in the German car manufacturing industry. Similar firms hiring similar workers at different points in time pay them different wages. We also find that these differences are quite heterogeneous among firms, such as they cannot be solely explained by market-wide business conditions. Initial wage differences between cohorts do tend to fade over time within firms. Similarly, firms' wages tend to converge to a market wage. However, reversion of initial wage differences occurs slowly.

In the second part, we find that initial wage differences are partly lost at job loss – high wage workers have much larger and highly persistent wage losses. This suggests that wage differences prior to a job loss are in part driven by temporary firm-specific rents. Part of these rents is likely to consist of firm-entry cohort differences, but they may also contain worker specific components such as search rents. We also observe mean reversion, i.e., low wage workers seem to permanently benefit from job loss. Consistent with the presence of temporary firm-specific wage components, past starting wages have an initial positive effect on wage levels after a job loss that fades over time. Pre-job loss characteristics appear to affect displaced workers' reservation wages until their wage is again determined by their skills and the overall wage distribution.

The results in this chapter highlight several important questions and areas for future research. First, it will be important to confirm our results with a wider sample of firms covering the entire German economy. An additional important question for future research is to establish to what extent worker mobility contributes to the reversion of

initial differences in wages between entry-cohorts. Third, using a larger sample we will be able to study the effect of exogenous events such as a mass-layoff at the establishment level. Similarly, we will be able to distinguish the loss of group-specific rents, such as average firm wage effects or cohort effects, from the loss of individual specific wage components arising among others from job search.

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Table 1: Sample Characteristics of Stable Firms and Displaced Workers in West-German Car Manufacturing 1975 to 2003

Panel A: Basic Characteristics of 55 Stable and Large Firms in Car Manufacturing

	Average	Std. Dev.	Median
Number of Cohorts	19.6	4.4	22.0
Employment Size	6376.7	9560.8	2161.0
Size of Entry Cohort	482.3	1678.8	88.0
Average Cohort Age	39.8	6.3	40.5
Average Cohort Fraction Female	0.11	0.05	0.10
Average Cohort Years of Education	10.50	0.63	10.25
Average Cohort Starting Wage	4.33	0.10	4.31
Average Cohort Log Real Daily Wage	4.49	0.17	4.49

Notes: Statistics based on firm-year-cohort observations or averages. Average cohort characteristics are weighted by cohort size.

Panel B: Average Characteristics of Various Samples of Displaced Workers

Years of Job Tenure Prior to Job Loss	Three	Five	Three, From 55 Large Stable Firms
Fraction Female	0.14	0.14	0.14
Fraction Non-German	0.17	0.18	0.21
Years of Education	10.45	10.39	10.21
Average Age	35.30	37.23	34.40
Average Potential Experience	18.85	20.84	18.19
Average Tenure on Lost Job	5.57	7.70	3.31
Fraction Part Time on Lost Job	0.03	0.03	0.08
Fraction Low-Skill Blue Collar on Lost Job	0.37	0.38	0.50
Fraction High-Skill Blue Collar on Lost Job	0.43	0.42	0.49
Fraction Low-Skill White Collar on Lost Job	0.18	0.18	0.29
Average Log Real Daily Starting Wage	4.25	4.26	4.25
Average Log Real Daily Wage	4.13	4.15	4.28

Notes: Sample only includes observations for workers who moved jobs followed by a spell of thirty days of unemployment or more at least once. Averages are taken over workers and worker years ranging from 5 years before to 15 years after job loss.

Table 2: Firm-Entry Cohort Effects and Average Starting Wages in German Car Manufacturing 1975-2003

Panel A: Distribution of Firm-Entry Cohort Effects by Decade

	Without Worker Characteristics			Controlling for Worker Characteristics		
	Year-Group			Year-Group		
Percentile	1970s	1980s	1990s	1970s	1980s	1990s
10	-0.041	-0.062	-0.059	-0.041	-0.062	-0.059
25	-0.014	-0.030	-0.027	-0.014	-0.030	-0.027
50	0.003	-0.004	-0.003	0.003	-0.004	-0.003
75	0.020	0.022	0.029	0.020	0.022	0.029
90	0.052	0.052	0.067	0.052	0.052	0.067

Panel B: Distribution of Average Starting Wages of Firm-Entry Cohorts

	Without Worker Characteristics			Controlling for Worker Characteristics		
	Year-Group			Year-Group		
Percentile	1970s	1980s	1990s	1970s	1980s	1990s
10	-0.046	-0.115	-0.112	-0.043	-0.094	-0.098
25	-0.019	-0.058	-0.060	-0.017	-0.048	-0.047
50	0.009	-0.014	-0.009	0.005	-0.011	-0.006
75	0.035	0.021	0.035	0.028	0.018	0.029
90	0.079	0.064	0.092	0.062	0.051	0.068

Notes: Distribution of average cohort wages by year-group. All models estimating cohort effects shown in Panel A also include a firm-specific quartic tenure profile, firm specific year effects, and a firm effects. The resulting firm-entry cohort effects are detrended. Average starting wages are net of year effects and firm effects. The observable characteristics in the right hand panels are fraction female, fraction non-german, fraction without degree, fraction with apprentice degree, fraction with college degree, fraction low skilled or high-skilled blue collar, and fratction low-skilled white collar. All models are weighted by the cohort size.

Table 3: Wage Losses at Job Loss 15 Years Post Job Loss, Different Samples and By Starting Wage at Lost Job

Year to Job Loss	Three Years of Pre-Job Loss Tenure	Five Years of Pre-Job Loss Tenure	Exits from Large and Stable Firms	Wage Loss By Interquartile Range of Starting Wage of Lost Job, Three Years Pre-Tenure		
				Low	Medium	High
-3	0.0043	-0.0002	0.0049	-0.0161	0.0071	0.0188
	(0.0037)	(0.0039)	(0.0157)	(0.0048)	(0.0039)	(0.0046)
-2	0.0053	-0.0087	0.0049	-0.0294	0.0114	0.0366
	(0.0058)	(0.0061)	(0.0244)	(0.0063)	(0.0058)	(0.0062)
-1	0.0031	-0.0221	0.0011	-0.0118	0.0039	0.0221
	(0.0080)	(0.0083)	(0.0336)	(0.0082)	(0.0078)	(0.0082)
0	-0.0331	-0.0624	-0.0313	-0.0378	-0.0372	-0.0192
	(0.0103)	(0.0106)	(0.0430)	(0.0103)	(0.0100)	(0.0102)
1	-0.1048	-0.1745	-0.3397	0.0794	-0.1513	-0.2139
	(0.0126)	(0.0131)	(0.0533)	(0.0126)	(0.0123)	(0.0128)
2	-0.0999	-0.1869	-0.3419	0.0998	-0.1483	-0.2205
	(0.0148)	(0.0153)	(0.0620)	(0.0146)	(0.0144)	(0.0146)
3	-0.0938	-0.1919	-0.3468	0.1193	-0.1436	-0.2251
	(0.0171)	(0.0176)	(0.0713)	(0.0167)	(0.0165)	(0.0167)
4	-0.0791	-0.1873	-0.3244	0.1352	-0.1301	-0.2145
	(0.0193)	(0.0199)	(0.0807)	(0.0188)	(0.0186)	(0.0188)
5	-0.0689	-0.1902	-0.3256	0.1517	-0.1218	-0.2112
	(0.0216)	(0.0223)	(0.0901)	(0.0210)	(0.0208)	(0.0210)
6	-0.0596	-0.1890	-0.3048	0.1571	-0.1132	-0.2028
	(0.0239)	(0.0246)	(0.0995)	(0.0231)	(0.0230)	(0.0231)
7	-0.0515	-0.1909	-0.2867	0.1644	-0.1066	-0.1949
	(0.0261)	(0.0270)	(0.1089)	(0.0253)	(0.0252)	(0.0253)
8	-0.0441	-0.1909	-0.2910	0.1722	-0.1005	-0.1929
	(0.0284)	(0.0293)	(0.1183)	(0.0275)	(0.0273)	(0.0275)
9	-0.0346	-0.1868	-0.2650	0.1728	-0.0929	-0.1820
	(0.0307)	(0.0316)	(0.1278)	(0.0297)	(0.0295)	(0.0297)
10	-0.0212	-0.1843	-0.2602	0.1877	-0.0855	-0.1747
	(0.0330)	(0.0340)	(0.1373)	(0.0318)	(0.0317)	(0.0319)
11	-0.0019	-0.1670	-0.2580	0.2002	-0.0748	-0.1530
	(0.0353)	(0.0363)	(0.1467)	(0.0340)	(0.0339)	(0.0341)
12	0.0164	-0.1562	-0.2317	0.2087	-0.0607	-0.1356
	(0.0375)	(0.0387)	(0.1563)	(0.0362)	(0.0361)	(0.0363)
13	0.0265	-0.1523	-0.2274	0.2163	-0.0566	-0.1266
	(0.0398)	(0.0410)	(0.1657)	(0.0384)	(0.0383)	(0.0385)
14	0.0360	-0.1504	-0.1953	0.2209	-0.0525	-0.1203
	(0.0421)	(0.0434)	(0.1753)	(0.0406)	(0.0405)	(0.0407)
15	0.0449	-0.1495	-0.2034	0.2282	-0.0482	-0.1192
	(0.0444)	(0.0458)	(0.1847)	(0.0428)	(0.0427)	(0.0429)
Constant	3.558	3.595	3.670		3.582	
	(0.0185)	(0.0239)	(0.0980)		(0.0178)	
Observations	501103	284297	25059		501103	
R^2	0.61	0.62	0.63		0.64	

Notes: The entries in the tables are coefficient estimates of regressions of log daily real wages on displacement indicators interacted with dummies for years before and after job displacement. The omitted category are years four and five before job loss. All models also include individual fixed effects, year fixed effects, and a fourth order polynomial in potential labor market experience. The sample excludes apprentices. Standard errors clustered at the individual level are in parentheses.

Table 4: Effect of Characteristics of Lost Job on Wage Levels After Job Displacement, Three Years Pre-Job Loss Tenure

	(1)	(2)	(3)	(4)
Log Starting Wage at Lost Job (STWAGE)	-	0.066	-	0.119
	-	(0.0068)	-	(0.0091)
Years Since Displacement (YRSINCE)	0.031	0.032	0.063	0.100
	(0.0012)	(0.0012)	(0.0025)	(0.0056)
YRSINCE^2	-0.0010	-0.0010	-0.0009	-0.0009
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Tenure on Past Job (TEN)	0.0119	0.0121	0.0217	0.0223
	(0.0019)	(0.0019)	(0.0021)	(0.0021)
TEN^2	-0.00059	-0.00057	-0.00074	-0.00074
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Years of Education (ED)	0.043	0.041	0.052	0.048
	(0.0010)	(0.0010)	(0.0013)	(0.0014)
Potential Labor Market Experience (EXP)	0.084	0.080	0.082	0.074
	(0.0087)	(0.0088)	(0.0089)	(0.0090)
EXP^2	-0.00622	-0.00603	-0.00626	-0.00582
	(0.00063)	(0.00063)	(0.00064)	(0.00065)
EXP^3	0.000184	0.000179	0.000189	0.000179
	(0.000019)	(0.000019)	(0.000019)	(0.000019)
EXP^4	-0.000002	-0.000002	-0.000002	-0.000002
	(0.00000)	(0.00000)	(0.00000)	(0.00000)
TEN*YRSINCE	-	-	-0.00127	-0.00129
	-	-	(0.0001)	(0.0001)
ED*YRSINCE	-	-	-0.00186	-0.00148
	-	-	(0.0002)	(0.0002)
STWAGE*YRSINCE	-	-	-	-0.00959
	-	-	-	(0.0013)
Observations	231185	231185	231185	231185
R^2	0.36	0.36	0.36	0.36

Notes: The entries in the table are coefficient estimates of regressions of log real daily wages after a job loss on characteristics of the lost job, year fixed effects, as well as individual characteristics. The specifications mirror closely that of Kletzer (1989). Regressors not listed in the table are a dummy for female and non-german, as well as nine dummies for industry, five dummies for occupation, a dummy for part time status, and three dummies for blue and white collar status, all pertaining to the lost job. The regression only include the first ten years after a job loss. Apprentices are excluded from the sample. Standard errors clustered at the individual level are in parentheses.

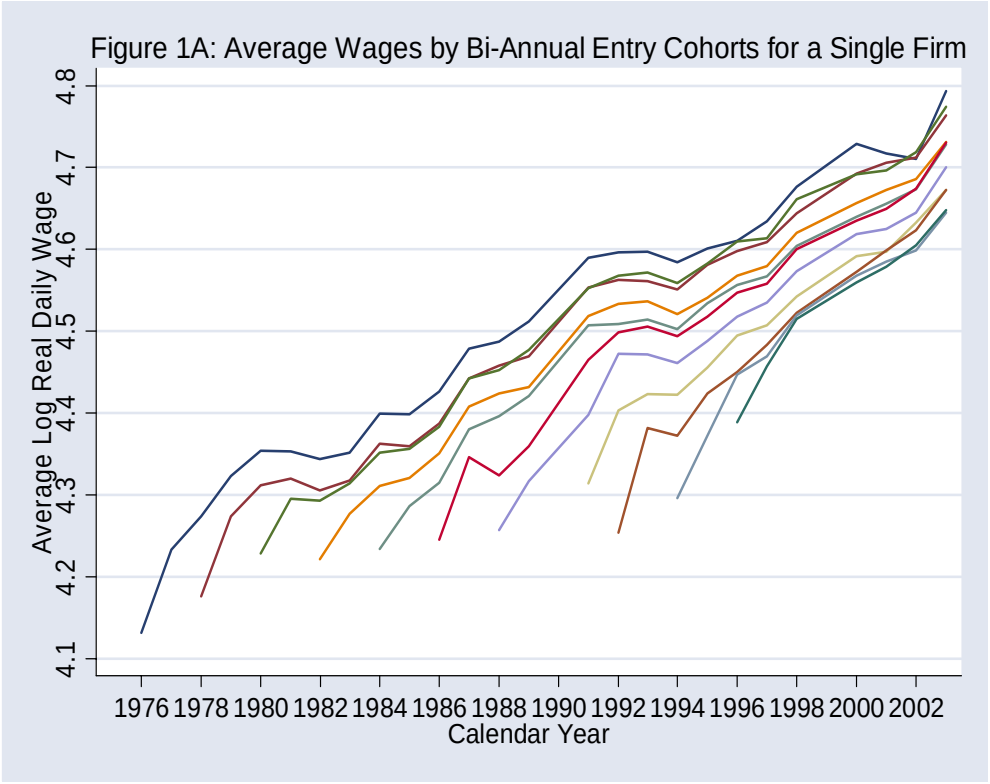
Figure 1A: Average Wages by Bi-Annual Entry Cohorts for a Single Firm
Average Log Real Daily Wage
4.1
4.2
4.3
4.4
4.5
4.6
4.7
4.8
1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002
Calendar Year

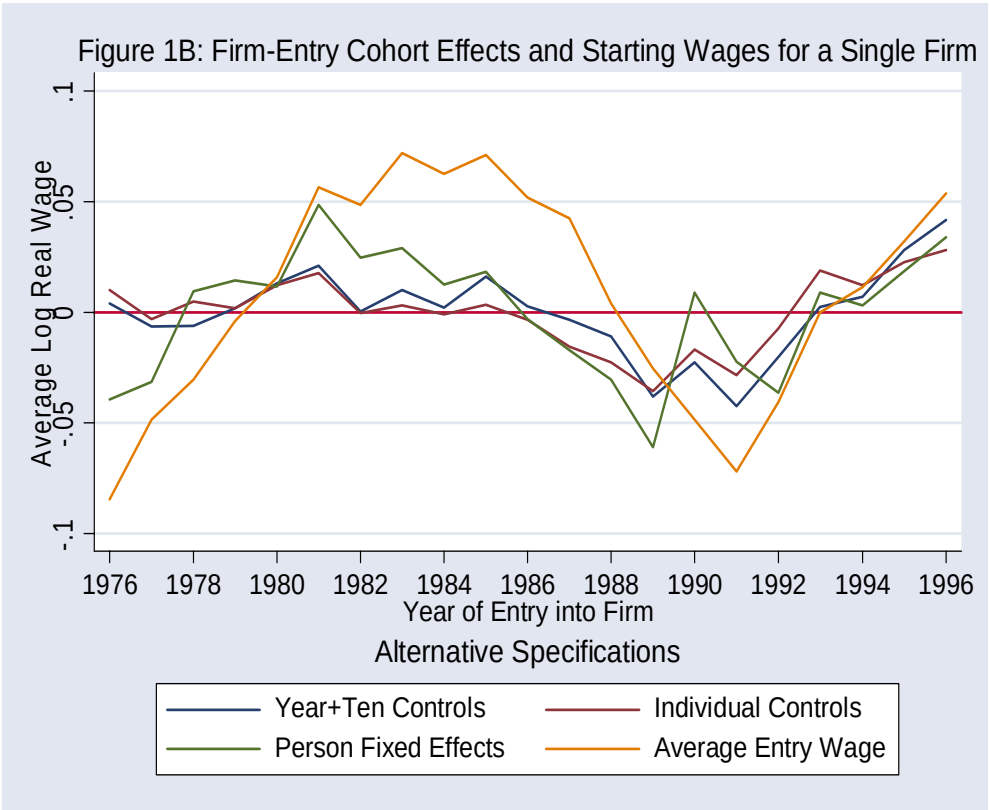
Figure 1B: Firm-Entry Cohort Effects and Starting Wages for a Single Firm
Average Log Real Wage
-.1
-.05
0
.05
.1
1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996
Year of Entry into Firm
Alternative Specifications
Year+Ten Controls
Individual Controls
Person Fixed Effects
Average Entry Wage

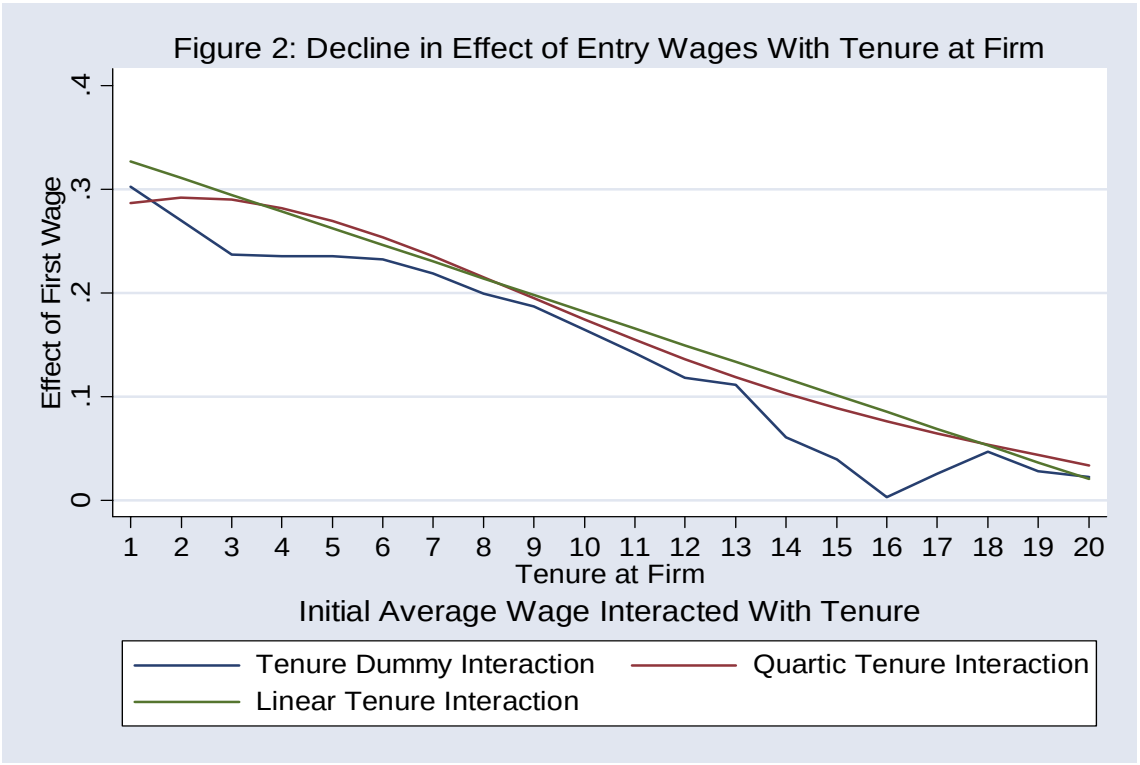
Figure 2: Decline in Effect of Entry Wages With Tenure at Firm
Effect of First Wage
0
.1
.2
.3
.4
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Tenure at Firm
Initial Average Wage Interacted With Tenure
Tenure Dummy Interaction
Quartic Tenure Interaction
Linear Tenure Interaction

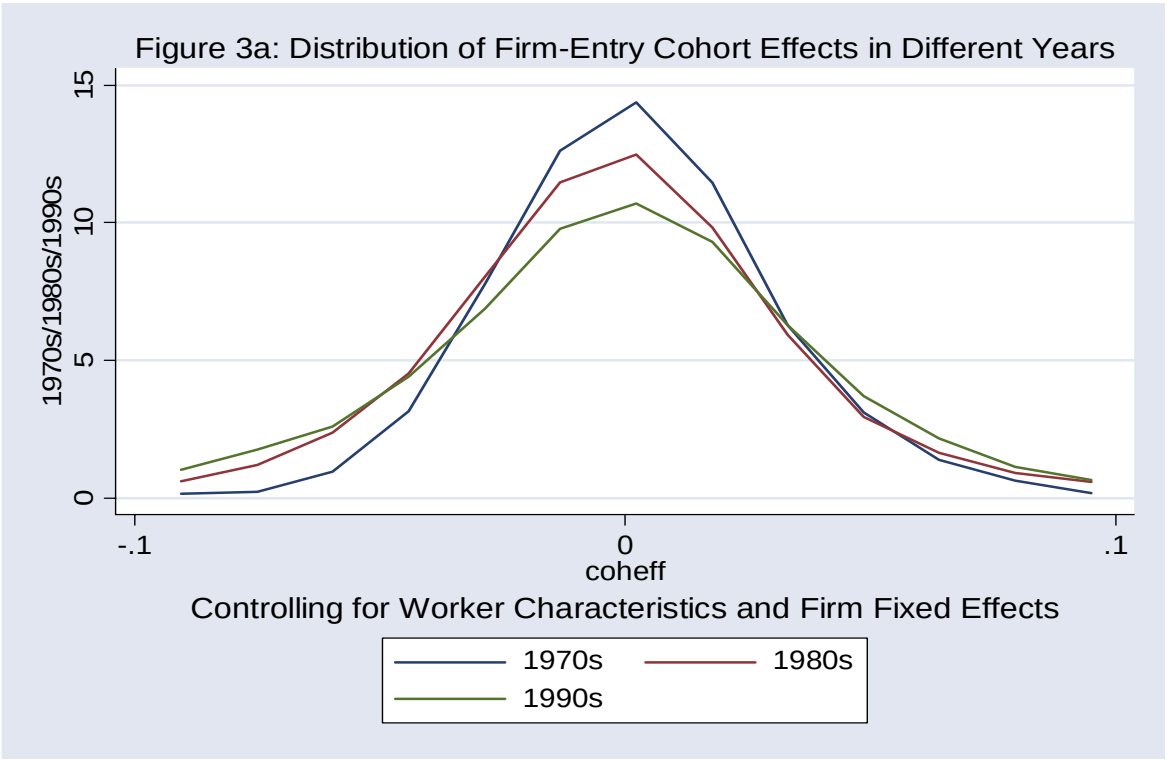
Figure 3a: Distribution of Firm-Entry Cohort Effects in Different Years
1970s/1980s/1990s
0
5
10
15
-.1
0
.1
coheff
Controlling for Worker Characteristics and Firm Fixed Effects
1970s
1980s
1990s

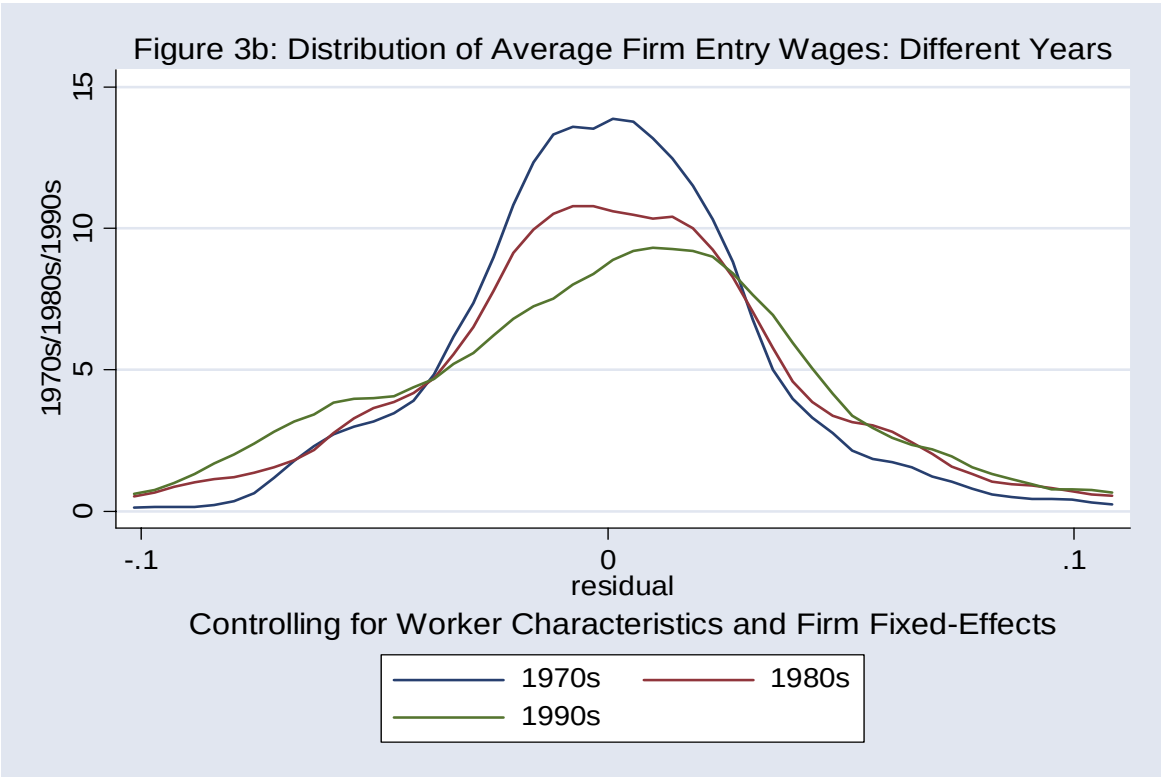
Figure 3b: Distribution of Average Firm Entry Wages: Different Years
1970s/1980s/1990s
0
5
10
15
-.1
0
.1
residual
Controlling for Worker Characteristics and Firm Fixed-Effects
1970s
1980s
1990s

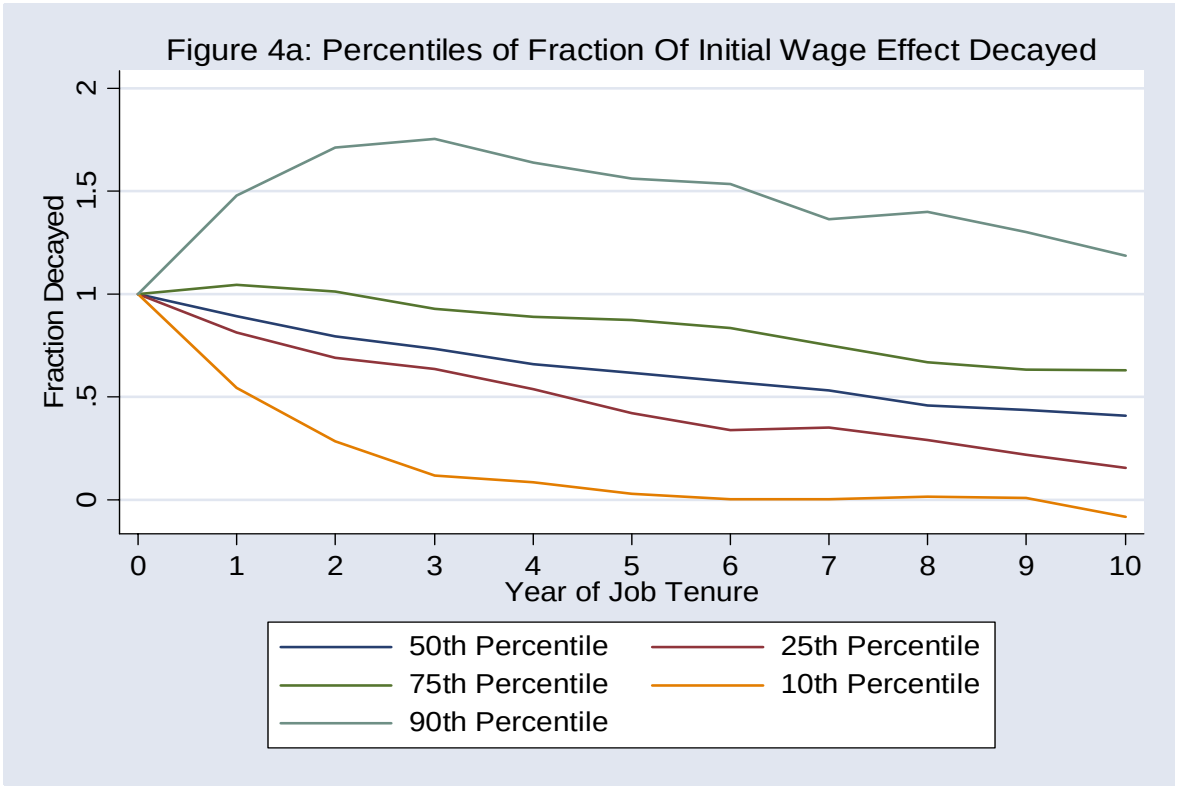
Figure 4a: Percentiles of Fraction Of Initial Wage Effect Decayed
Fraction Decayed
0
.5
1
1.5
2
0
1
2
3
4
5
6
7
8
9
10
Year of Job Tenure
50th Percentile
25th Percentile
75th Percentile
10th Percentile
90th Percentile

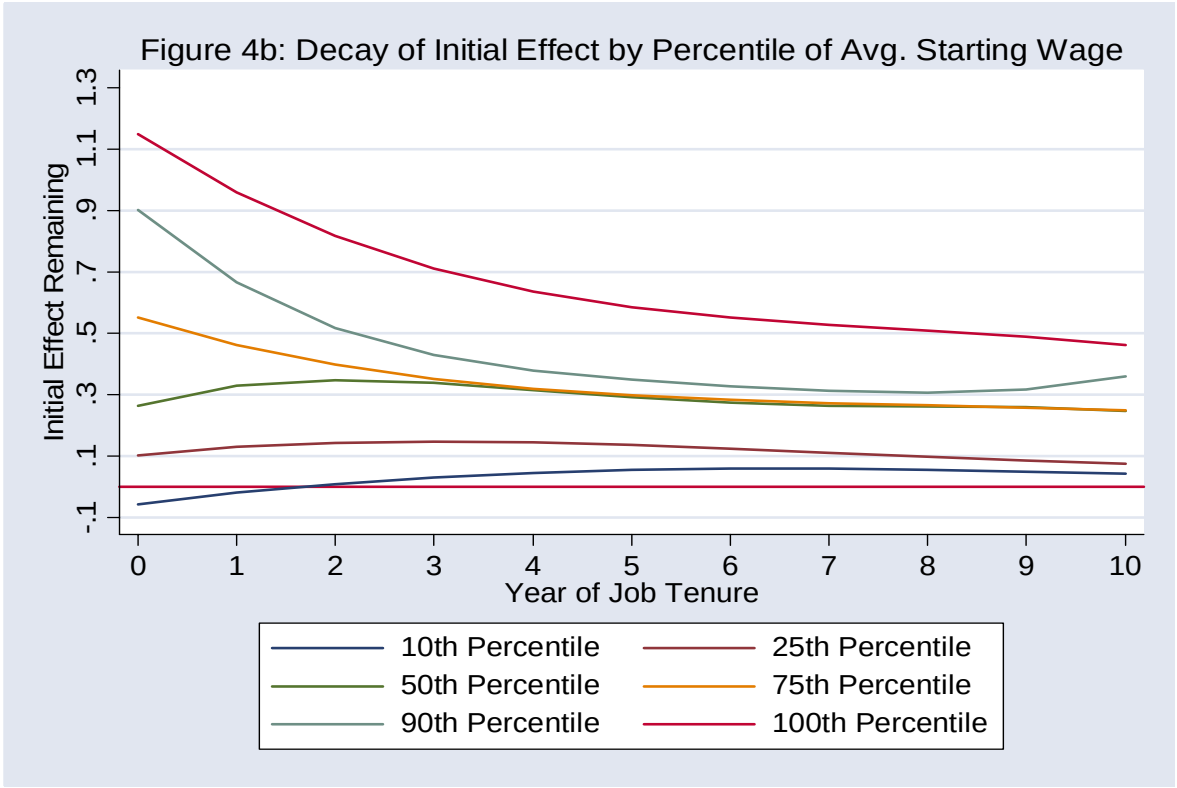
Figure 4b: Decay of Initial Effect by Percentile of Avg. Starting Wage
Initial Effect Remaining
-.1
.1
.3
.5
.7
.9
1.1
1.3
0
1
2
3
4
5
6
7
8
9
10
Year of Job Tenure
10th Percentile
25th Percentile
50th Percentile
75th Percentile
90th Percentile
100th Percentile

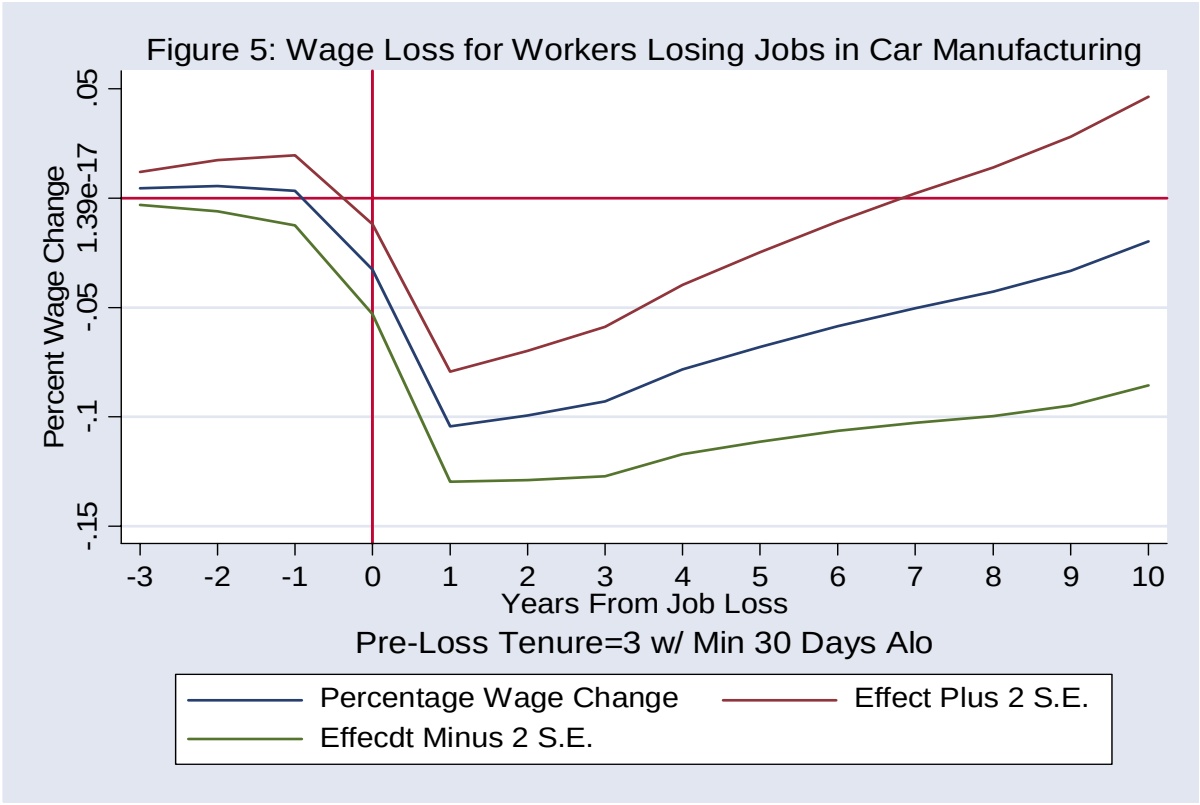
Figure 5: Wage Loss for Workers Losing Jobs in Car Manufacturing
Percent Wage Change
.05
1.39e-17
-.05
-.1
-.15
-3
-2
-1
0
1
2
3
4
5
6
7
8
9
10
Years From Job Loss
Pre-Loss Tenure=3 w/ Min 30 Days Alo
Percentage Wage Change
Effect Plus 2 S.E.
Effecdt Minus 2 S.E.

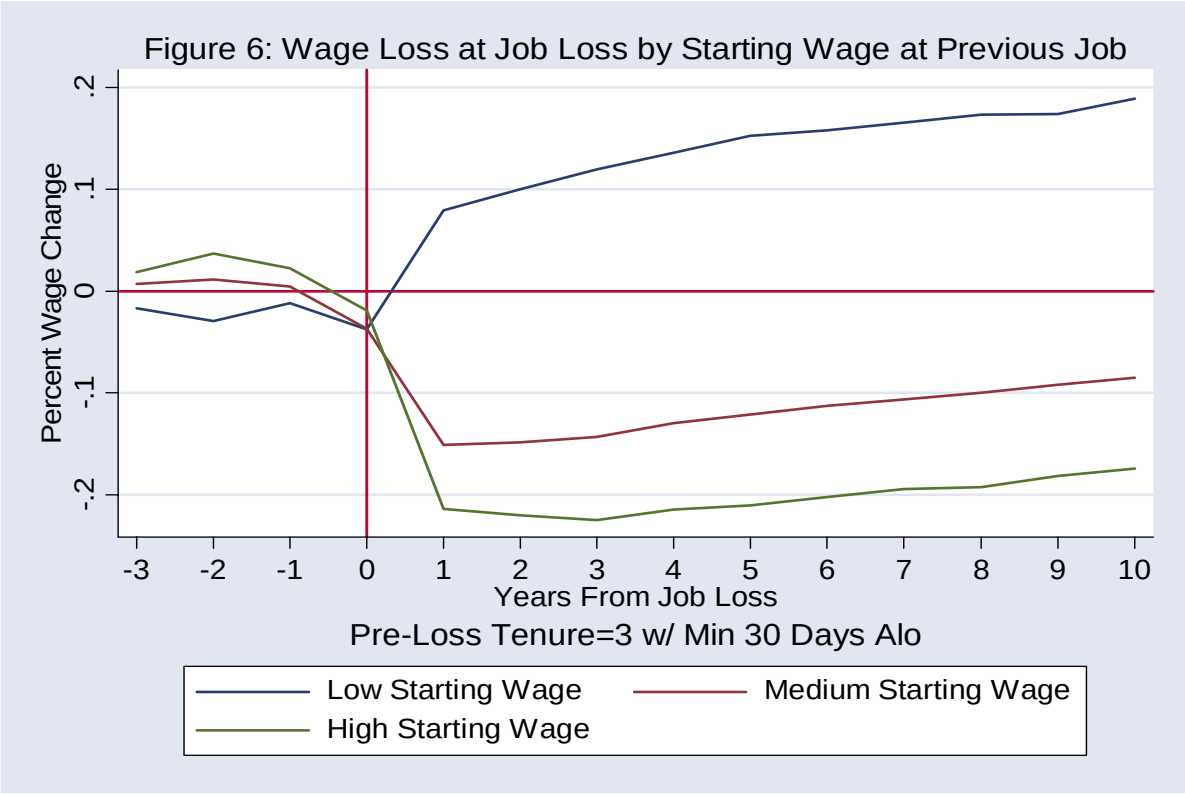
Figure 6: Wage Loss at Job Loss by Starting Wage at Previous Job
Percent Wage Change
.2
.1
0
-.1
-.2
-3
-2
-1
0
1
2
3
4
5
6
7
8
9
10
Years From Job Loss
Pre-Loss Tenure=3 w/ Min 30 Days Alo
Low Starting Wage
Medium Starting Wage
High Starting Wage