

Very preliminary

Tenure and Firm-Specific Human Capital

By

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Abstract

Long-term worker-firm relationships are common in Denmark, and the distribution of ongoing firm tenure has remained remarkably stable over the past 30 years. This is true both by gender and over the lifecycle. However, the between-firm proportion of the variance in tenure has been rising during the 1990's. This is against a background of fairly constant economic returns to tenure, at 2%, similar to comparable estimates from the US. Following Kletzer (1989) we decompose the returns to tenure into that due to firm-specific human capital and worker heterogeneity, by exploiting exogenous worker displacement due to firm closures. We find that the proportion of tenure returns due to firm-specific human capital has risen from a stable 10% throughout the 1980's to 30% today. The increasing importance of firm-specific returns to tenure coincides with decentralisation of Danish wage negotiations. These numbers are still much lower than the 70% found for the US, but in contrast, the Danish results are robust to individuals moving industry. In other words, our firm-specific returns to tenure are not simply industry-specific ones.

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1. Introduction

In recent years there has been a growing interest for the mobility and stability on the labour market. OECD (1997) wrote about a growing sense of job insecurity in many member states. OECD (1997) demonstrates that tenure at the current employer has actually declined in some countries, while it is not found that it has increased in any country. Part of the decline is, however, due to a changed composition of workers and changed job change patterns for age groups and gender as summarized by Farber (1999).

Another strand of literature about worker-employer relationship stability is the literature on job turnover. Davis and Haltiwanger (1999) report worker turnover rates of about 19% for manufacturing industry in the USA. Albæk and Sørensen (1998) show a similarly high turnover for Denmark. Other European countries seem to have lower turnover than Denmark, see OECD, 1999. However, there is plenty of evidence that turnover is different between firms, industries, worker groups and in many other dimensions. Werwatz et al. (1999) have shown that manufacturing is not the only industry with high turnover rates, and that some industries have average turnover rates that are almost 30% higher than manufacturing, while others are lower. Turnover is in many of these studies shown to be cyclical. The time span in most studies have not allowed for determining if there has been a trend in turnover.

This paper uses a new data source to look at the question if tenure has become longer or shorter over the last 3 decades. Our statistics show that the average tenure for men in the age group 31-50 has been fallen from 6.33 years in 1980 to 5.49 in 1998. For women in the same age group the average tenure has increased from 5.05 to 5.45. But this is only part of the picture. The remainder of the paper will analyse the composition of tenure by groups of workers. The paper is organised as follows. Section 2 describes the theoretical background, section 3 describes the data and presents the basic statistics, and section 4 attempts to see if the change in average tenure can be described by a reduction of the return to tenure over the investigated period.

2. Background

There are in Denmark compared to other countries a number of causes why we should find a lower tenure than in other countries:

First, wage scales are probably among the most compressed in the OECD area. Compressed wages make it more difficult for an employer to give a good worker a higher wage in order to retain him. The only way a person on an individual basis can get a higher wage will be to apply to a different employer with a higher mean wage. If this is a constraining factor, we will expect that returns to tenure are low. We will also expect that tenure is relatively short. The wage factor has changed nature over the observed period with respect to wage bargaining system in a way that is expected to influence the firm influence on the return to tenure, if there is one. Until 1987 wage bargaining was characterised as central, though there was a centrally and a locally negotiated wage element. The period until 1992 was characterised by coordinated wage bargaining with strict guidelines. After 1993, wages were negotiated at firm level and more and more employees negotiate their wages directly with their employer. We will therefore expect that any firm element in tenure becomes stronger in the latter period. We will also expect that the returns to tenure is higher in the latter period.

Second, employment protection is weak in Denmark, and similar to the level of the US.

Third, UI-benefits are relatively high for low wage earners. And benefits can be obtained for a long period. Furthermore, there is almost no experience rating in the system.

Fourth, pension rights are independent of firm attachment.

These factors all pull in the direction of short tenure. The consequences of low tenure are low benefit for firms of training, lower specific capital, which again gives lower returns compared with other countries. This is expected to have a negative effect on productivity. The benefits are a more flexible work force in the sense that it is easy to hire and fire people according to shifts in demand.

Of course this will have an impact on the types of firms operating in Denmark. Those, who can not operate productively under these conditions will not thrive and those who can benefit from the current conditions will grow. Furthermore, if short tenure is not productive for some firms one should expect that they these firms do more in order to extend tenure than others. A number of

possibilities are open. Firms could increase the premium to longer tenure in monetary or career terms. They could also bundle monetary and career elements with different types of benefits.

After a decomposition of tenure in the first part of the paper, we will look into the question on returns to tenure.

3. Data Description

The data used in this study originates from the merge of data from two sources: The first is the Statistics Denmark IDA (Integrated Database for Labour Market Research) Register. IDA contains information on labour market conditions for persons and workplaces in Denmark over the years 1980-1998. The IDA data originates from various administrative registers. The important feature of IDA is that it is possible to associate workplaces with the identity of all employees at a specific day in November (see Leth-Sørensen, 1998). However, IDA data only starts in 1980 with the result that data are censored prior to 1980 but are rich on information about persons and workplaces and firms after that period. Therefore, we have merged this data with data from the supplementary pension system, ATP. ATP was created in 1964 and is a comprehensive pension system, where all employed have to pay contributions that are related to total hours of work. 1/3 of the contributions are paid by the employee and 2/3 are paid by the employer. As a result, the ATP system has records for the total contribution for each employee at each employer. These records are subsequently used to construct continuous spells of tenure with each employer. Spells are *not* transformed to a full-time equivalent basis. This means that a part time spell that has lasted 4 years is counted as 4 years irrespective of hours of work. Employers are defined by their employer identification number, which is changed if ownership in a strict legal sense changes. We have corrected for those cases where more than 50% of all employees are taken over by the new legal employer. In these cases, tenure is said to be continuing. Similarly, if there are short breaks in the employment spell due to temporary lay-offs and maternity leaves. As long as the person continues at the old employer their spell is considered to be ongoing. Despite of these precautions in dealing with the administrative records we will expect that survey based data tend to display longer spells of employment than register based data simply because people with high tenure will tend to exaggerate the real length of the spell and because our ID-filter after all will not catch all apparent but not real changes of firm identity.

The merge of the IDA and ATP data sets enables us to construct tenure for all employees after 1964. However, we only have the full set of background characteristics after 1980, so we have limited the data set to those who were employed after 1980 but the ATP data enables us to observe all ongoing employment spells in 1980 and to follow them from the start. As a result tenure is censored at 17 years for this first group. Since there are only 2.9 % of all women and 7.1 % of all men affected by the censoring in 1980, this problem is considered minor.

The total data set consists of 850000 observations and descriptive statistics are based on a 10% sample.

Figure 1 presents the distribution of tenure at the current employer for selected years, where all observations with tenure above 17 years are top-coded at 17. The years are selected so as to be representative of different points in the business cycle. The number with tenure equal to one comprises those who terminate their employment before the second year and those who will have an ongoing spell of employment. Consequently, years with many hires will have more persons with tenure equal 1 than other years.

Figure 1. Tenure distribution for men, selected years, top coded at 17.

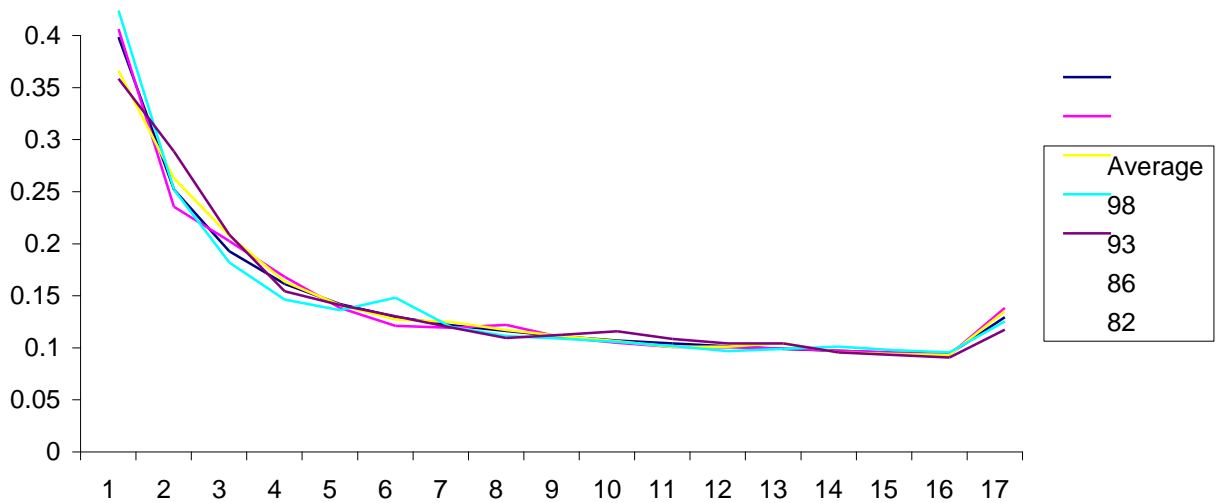


Figure 2. Tenure distribution for women, selected years, top coded at 17.

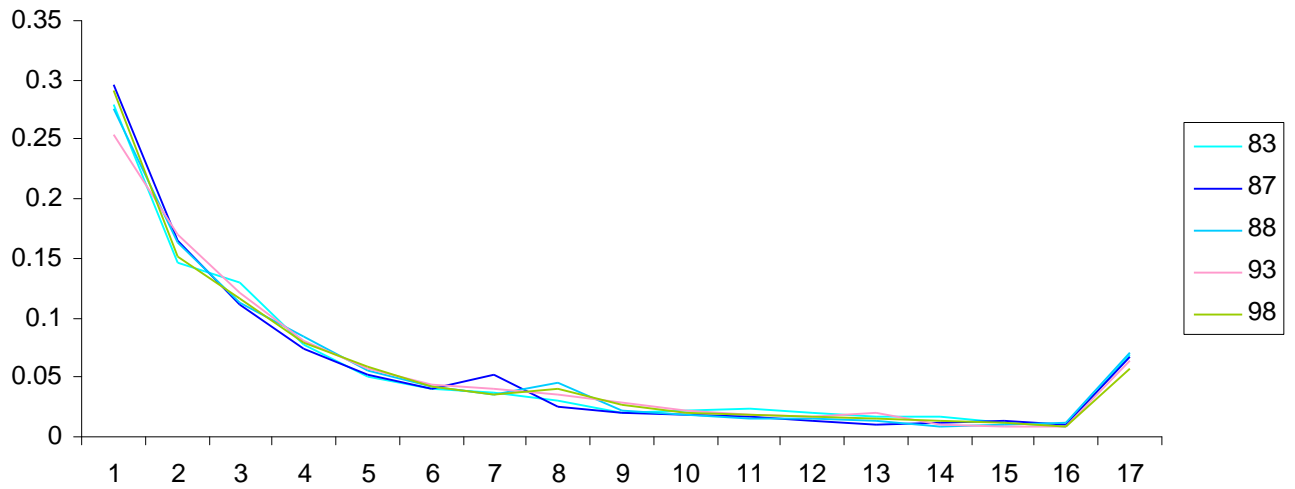
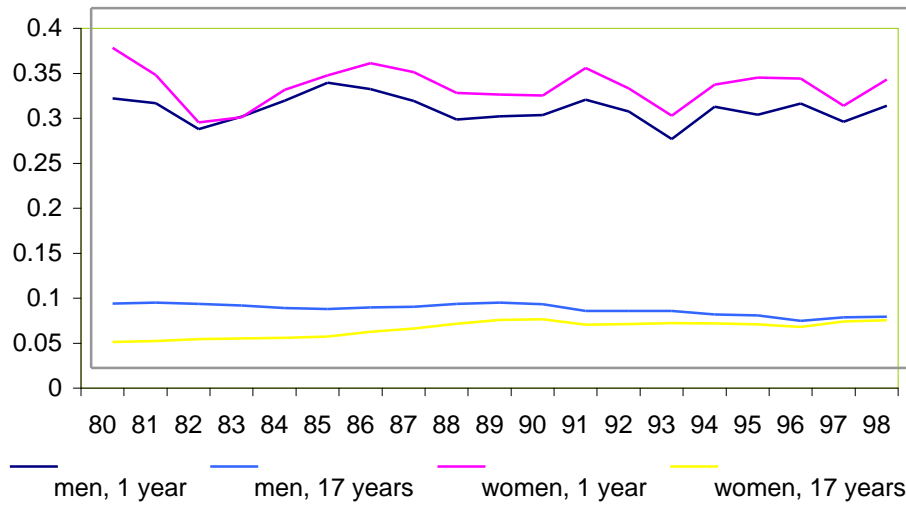


Figure 1 and 2 shows that the tenure distribution for men and women have the same profile and that the five selected tenure distributions are almost identical. The five curves do not differ much between different points of the cycle.

The other dimension is the fraction of workers experiencing long terms of tenure. We have first chosen to show how many have experienced at least 17 years of tenure, because 17 years is the longest non censored period that can be shown in the data. Figure 3 shows that the proportion of people who stays 17 years and more at the same workplace is only about 5% for men and women together. The proportion of long tenure has actually risen for men and fallen for women. Thus, real long term employment relationships are not very common. Only 15% of the workforce experience employment spells 10 years and longer. It is also remarkable, that we see that men have increasing tenure, while women experience decreasing tenure and that the two curves seems to meet around 15%.

The upper Graphs in Figures 3 display the fraction with only one year of tenure measured as ongoing spells. The average levels are 31% for men and 29% for women. The time pattern shows relatively weak cycles that reflect hiring patterns over the business cycle.

Figure 3. The proportion of men and women with low and high tenure, 1980-1998.



However, there appears to be large differences between age groups and the decline seen in long tenure may partly be explained by a different age and gender composition of the work force.

Table 1. Tenure at current employer for age groups and gender, 1980 and 1998.

	15-18	19-30	31-50	51-60	61-70	71-74	Total
Men							
1980	1.2711643	2.9781886	6.3352639	8.3807672	7.6680602..		5.1349223
1998	1.4691011	2.7784228	5.4937816	7.4333489	7.1661701	5.7932011	4.8717035
Women							
1980	1.1665116	3.0316365	5.0497255	6.5983206	6.1432136..		4.2270197
1998	1.4617183	2.4601168	5.449223	7.5404453	7.9468085	7.5034483	4.5912738

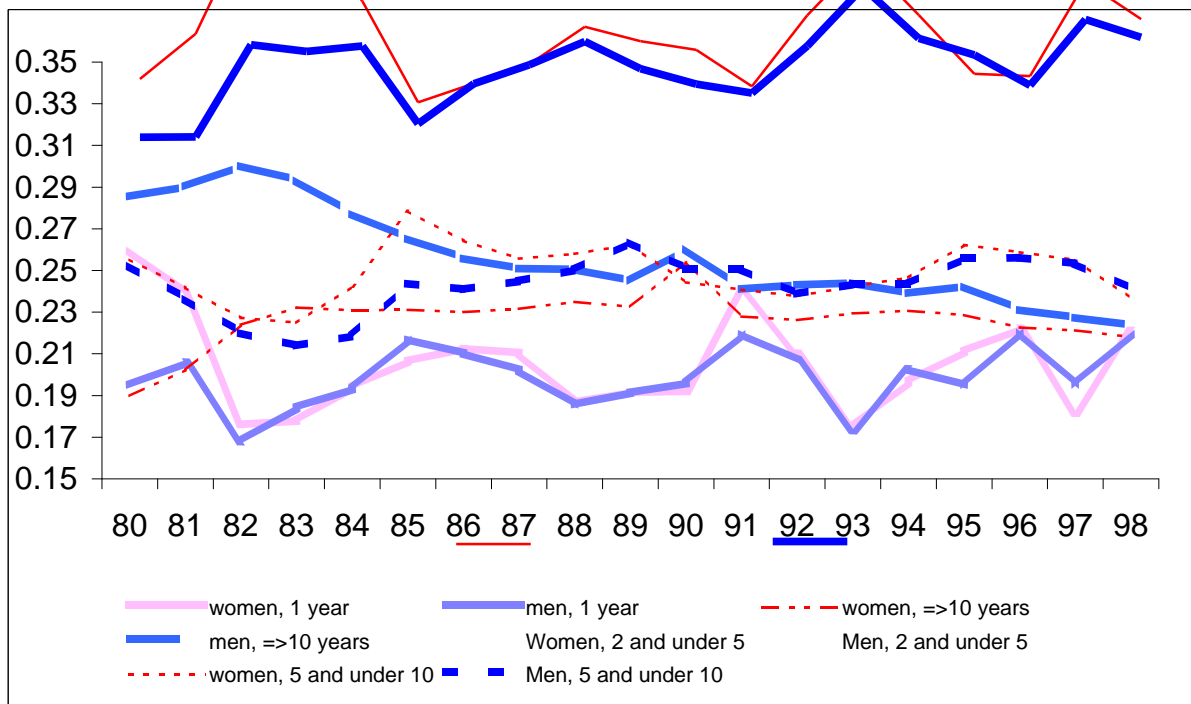
Table 1 shows different tenure levels for age groups. The longest tenure is found for the group of 51-60 years old. They have had the longest time to find a good match. Comparable figures are found among the 61-70 years group, which at first may appear strange given the growing tendency to early retirement. But the explanation is that fewer and fewer stay on the job, but those who stay have typically a long tenure at the current employer. The same age pattern is found among women. It is remarkable that tenure for women looks very much like tenure for men in 1998.

Furthermore, it is noticeable that there has been a pronounced decline in tenure at the current employer for men of all ages except the youngest. The decline has been largest for the two “core” age groups of 31-50 and 51-60 year olds. Different early retirement programs have undoubtedly affected the latter group, but the decline for this group does not differ from those aged 31-50. The

opposite effect has been dominating for women. Women have for all age groups but the 19-30 years age group extended their tenure, so that it is on par with men in 1998. Women are still working more part time, but they stay equally long with the same employer. The age interval 19-30 is affected by extended maternity leaves. (The maternity leave itself will probably not affect our measure of tenure but a program for extended maternity leave, that took effect in 1993 might have had some effect on tenure for this age group).

These tables show clearly that long tenure and the large proportion of observations are found in the age groups between 30 and 60. Figure 4 summarizes the development of different levels of the tenure distribution. It is easily seen that females, already in the beginning of the 1980s, gain the same level of tenure as men. In 1980 more than 25% of all women have a one year tenure, while the similar number is only 20% for men. This difference disappears in 1982. Similarly for the above 2 and below 5 years of tenure, but the meeting point happens a little later. For this group it is remarkable that women tend to increase their tenure a bit more than men in the upswings. The curves for between 5 and 10 years show the highest level for men, though the gap is closing. Finally, the curves for tenure more than 10 years shows that women in the 1980s tended to stay longer than men, but that gap disappeared after 1990.

Figure 4. The distribution of tenure for age and gender.



Thus, we can conclude that the share of long run tenure went down in the beginning of the 1980s with a slightly growing proportion of males staying between 2 and 5 years. The fraction having 1 year of tenure does not change much over the entire period. The difference between men and women disappear in the 1980s. The apparent decline in tenure for men is partly masked by an increase of tenure for women following their integration in the Danish labour market. This happened to a large extent during the 1980s. Other differences over time must therefore be the result of different composition of the work force.

Finally, we will compare the Danish numbers to what is found in other countries. International comparisons are always difficult because of different data set-ups. In this context we have taken statistics from OECD (1997) for Denmark and all other OECD countries and compared it with our own results. Our results will have to be different from those reported for Denmark by OECD because we use a much bigger sample and data are not based on self reported information as in the European Community Labour Force Surveys used by the OECD.

Table 2. OECD statistics on tenure (Upper panel) compared with our estimates (lower panel).

	1 and under 2 years	2 and under 5 years	Under 5 years	5 and under 10 years	10 years and over	Average tenure
Australia	37.8	21.6	59.4	19.5	21.1	6.4
Austria	21.5	21.2	42.7	19	38.3	10
Belgium	19.3	17.5	36.8	19.6	43.6	11.2
Canada	22.7	28	50.8	19.8	29.4	7.9
Czech Republic	43.6	12.3	55.8	12	32.2	9
Denmark	36.5	16.2	52.7	18.2	29.1	7.9
Finland	23.8	13.4	37.2	23.1	39.7	10.5
France	23	17.7	40.6	17.4	42	10.7
Germany	25.5	22	47.5	17.2	35.3	9.7
Greece	21.1	18.5	39.6	20.6	39.8	9.9
Ireland	28.7	20.1	48.8	18.1	33.1	8.7
Italy	15.5	18.1	33.6	20.8	45.6	11.6
Japan	22.6	13.9	36.5	20.7	42.8	11.3
Korea	35.2	19.7	54.9	15.9	29.2	8.7
Luxembourg	20	20.7	40.7	21.4	37.9	10.2
Netherlands	27.7	20.4	48.1	20.3	31.6	8.7
Poland	5.7	7.1	12.8	12.5	74.7	17.5
Portugal	22.4	17.5	39.9	18.5	41.6	11
Spain	40.3	11.1	51.4	14.4	34.2	8.9
Sweden	22.2	15.1	37.3	23	39.7	10.5
Switzerland	24.7	20.8	45.5	22.9	31.6	9
UK	30.3	19.5	49.8	23.5	26.7	7.8
US	34.5	20	54.5	19.8	25.7	7.4
Private sector, based on ATP-P&P data						
Denmark, all labour force	29.8	37.4	67.2	16.8	16.0	4.81
Denmark, 30-60 years old	19.6	18.6	38.2	38.2	23.5	6.20

Source: OECD Employment Outlook, 1997,
table 5.5

Based on EC-LFS for EC.

The OECD numbers show that Denmark is clearly in the group of countries with the lowest fraction of those with more than 10 years of tenure. It is also seen that the number for short tenure is very large in Denmark. Both features bring Denmark on par with Korea and Switzerland. If we compare with the numbers from our own measurements, we find that there are fewer observations with short tenure but also fewer with long tenure. This point is strengthened when limiting the analysis to the core age groups. Unfortunately, OECD does not state which age groups are in the table. Most likely it is the age group 18 to 59 year as in the EC-LFS.

The remaining question is now if these tendencies are reflected in the returns to tenure.

Figure 5 shows the importance of heterogeneity in individual worker ongoing firm tenure over the business cycle. Each point is a R-bar-squared measure of goodness of fit from a separate regression. The regressions are simple analyses of variance, where mean parameters are estimates of age dummies interacted with gender together with sets of dummies corresponding to different groupings. Each line corresponds to a different grouping over the years (none, firm and various industry classifications). It is evident that all industry groupings follow a similar pattern of no trend in heterogeneity over the sample period. This is in contrast to the firm-wise grouping which shows markedly increased explanatory power over the 1990's.

Figure 5. Tenure Heterogeneity.

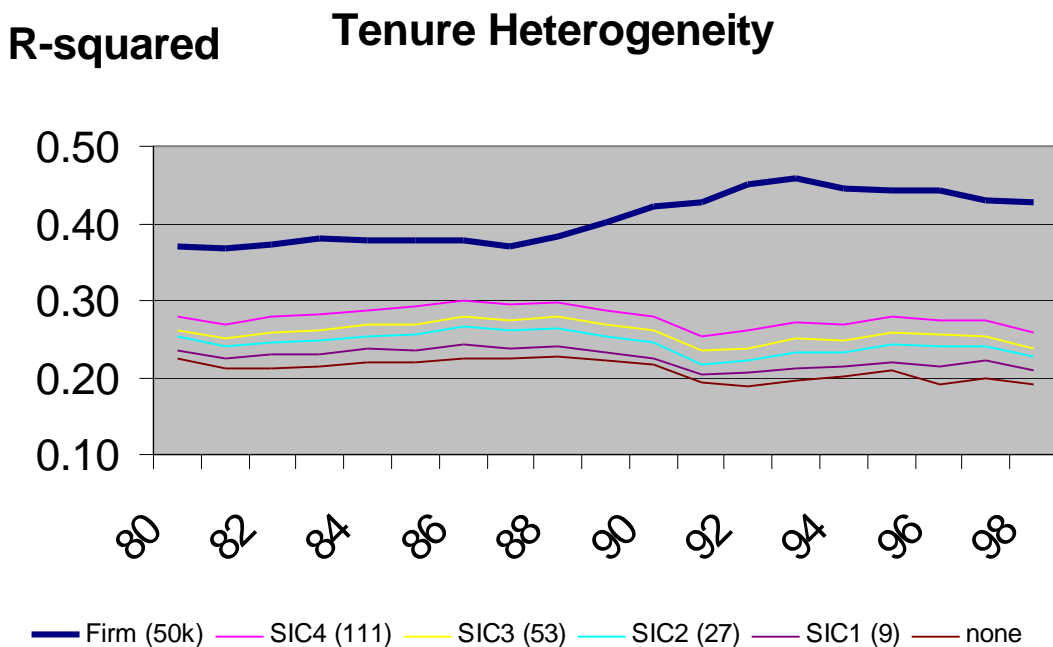
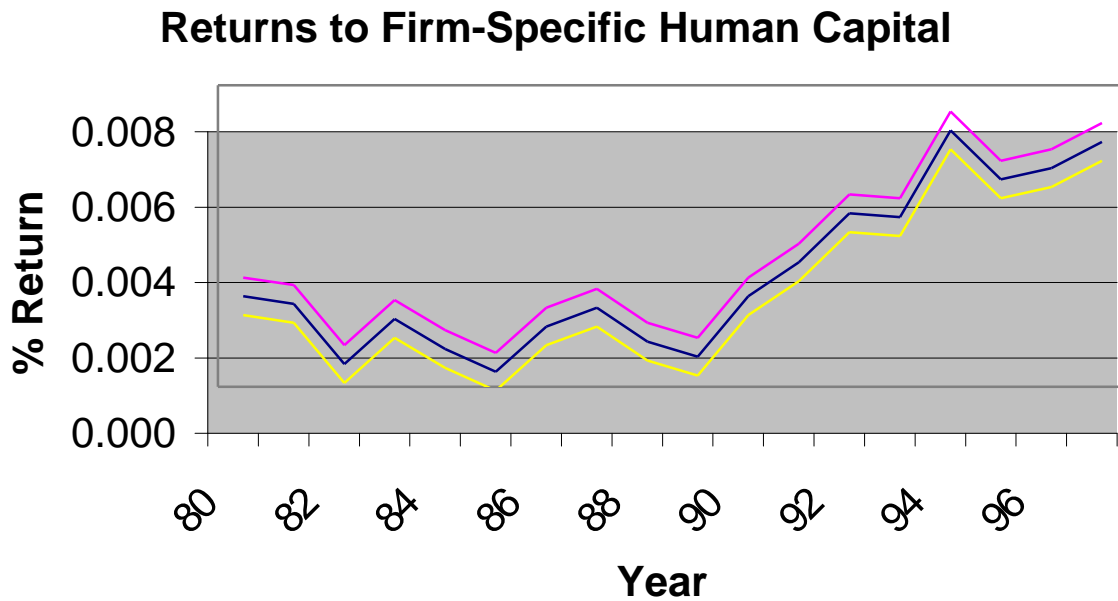


Figure 6 shows how this is reflected in returns to firm-specific human capital. This follows the approach of Addison and Portugal (1989) and Kletzer (1989) of considering workers displaced due to firm closure. The returns to pre-displacement tenure are estimated on pre-displacement wages and in the first year of post-displacement wages. The difference between the two estimates measures the return to firm-specific human capital, and the remainder, which is persistent, is attributed to unobserved individual worker heterogeneity. While the returns to tenure average 2% and are similar to those found using similarly simple techniques on US data, the returns to firm-

specific human-capital constitute only about 10% of those overall returns, compared to the US figure of 70%.

Our figures are robust to whether or not the post-displacement job is within the same industry, at whatever level. These findings contrast to Neal (1995) who found insignificant returns to firm-specific human capital over and above those due to 2-digit industry.

Figure 6. Returns to Firm-Specific Human Capital



5. Summary and Conclusions

Long term employment relationships are common in Denmark, as in other rich countries. A small empirical literature has tried to measure the relative contributions to this of worker heterogeneity and firm-specific human capital. Here we apply the ideas from this literature and obtain results in stark contrast to those found in the US. While the (OLS) economic returns to tenure are similar at around 2%, of that, at most 30% is due to firm-specific human-capital in Denmark. This is in contrast to the 70% reported in Farber (1999) using the US Displaced Workers Survey. In further contrast to the US studies, where the firm-specific human-capital results were found not to be robust to workers switching industry, for Denmark our measures of firm-specific human capital are robust, even between narrowly defined industries. The Danish result of increasing importance

of firm-specific human capital during the 1990's is consistent with the decentralisation of wage bargaining and increasing importance in tenure-heterogeneity between firms.

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