

Where did they go? *

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Abstract:

We study individual job-separations and their associated destination states for all individuals in the private sector in Denmark for the period 1980 to 1995 and account for their magnitude and cyclical flows. We find that individual and workplace characteristics as well as business cycle effects are important factors in order to explain the individual behaviour. In policy simulations we look at the consequences for individual transitions. We find that structural and growth policies reduce transitions into unemployment but in general they have different implications for the economy. Policy interventions targeting displaced workers coming from plant closures are argued to be inefficient.

JEL classification: J63; J65; E24

Keywords: Business cycles; Job separations; Transition probabilities

* An early version was presented at the conferences “Lavoro e Disoccupazione: Questioni di Misura e di Analisi” Feb. 2000, CAED Oct. 2001 and workshops and conferences at IZA, AFSE and Panel’10 in 2002. Comments from participants and in particular from John C. Haltiwanger and Bruno Contini are appreciated. We thank Anders Aagaard and Thomas Busch for valuable research assistance. The Danish Ministry of Employment and the Research Foundation of the University of Aarhus have financed the work.

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1. Introduction

In recent years, several studies have described job and worker flows for various countries based on matched employer-employee data. See, for instance, Davis and Haltiwanger (1992) for the U.S., Hamermesh et al. (1996) for the Netherlands, Abowd et al. (1996) for France and Albæk and Sørensen (1998) for Denmark. These studies document how individual establishments adjust their workforce in response to the multitude of shocks they are exposed to, and go on to develop the implications of this micro-level adjustment process for aggregate, macro-level quantities such as total job creation and total job destruction in an economy. The findings of this largely data-driven research have produced “stylized facts” about such features of job and worker flows as magnitude, persistence, cyclicalities and distribution across establishments.

The main finding in these studies is that large proportions of the labour force leave their jobs every year. Similarly, each year many jobs are filled with new employees. Implicitly, it is assumed that people leave their jobs due to external shocks to their firms. It is also assumed that most of these persons are looking for other jobs. The main flows cover, however, a number of different flows with different destinations, where it is less obvious that business cycle shocks are the determining factor. Some of the flows are probably determined by external factors such as retirement. There is, however, little knowledge about the nature of these flows.

In this paper, we account for the magnitude and cyclicalities of the flows taking place after a job separation from the private sector. The flows are decomposed by destination states where the main groups are unemployment, reemployment and out of the labour force as in Blanchard

and Diamond (1990). We contribute to the literature by showing a full description of the flows. The job-to-no-job flows are decomposed into transitions with as many as 6 different destinations i.e. education, pension, unemployment etc. Also the job-to-job flows can be decomposed. The immediate benefit of this detailed decomposition is an improved understanding of the flows and a “sharpening” of the analysis made on the data.

Furthermore, we study the importance of individual and firm characteristics as well as the influence of the business cycle on the probability of ending up in a particular destination state. This approach is motivated by the analysis in Anderson and Meyer (1994). We find large heterogeneity both within and between destination states and explicitly discuss age and gender effects on the distribution of flows. The business cycle is found to be an important determinant for the destination of flows.

In a policy section, we simulate the impact of a growth policy and a structural policy, which is changing the incentives of individuals by lowering the level of unemployment benefits. The two policies are shown to have different implications for the economy, but both reduce the transitions into unemployment. In this section, we also question the importance of policies targeting closing firms because the empirical findings indicate that individuals separating from a closing firm do better in the labour market than individuals separating for other reasons. The main finding in this discussion is the importance of within-firm-reallocations.

We make use of a special data set drawn from the register-based Integrated Database for Labour Market Research (IDA) created by Statistics Denmark and containing information on

all employees of *all* establishments in *all* sectors. Our data run from 1980 to 1995 and span almost two full business cycles.¹

The next section briefly describes the data used; section 3 contains results regarding the magnitude of different job and worker flows; section 4 looks at the cyclicity of flows, section 5 looks at the individual determinants and section 6 discusses policy implications. Section 7 summarises and concludes.

2. Data

IDA includes register-based information on all establishments and residents in Denmark. Persons and establishments are matched at the end of November each year, and we are able to obtain a comprehensive snapshot of all establishments in Denmark and all of their employees at this point of time each year from 1980 to 1995. Both establishments and persons are assigned a unique identification number and can be followed over time.

All flows calculated in this paper are based on comparing worker and establishment matches in consecutive Novembers. Hence, employment relationships (and associated flows) that last from, say, January to April of any given year are not picked up. As such, our figures should be considered a lower bound measure of actual flows. We focus on a worker's primary end-of-November employment relationship and ignore all other employment relationships of individuals who work multiple jobs at this time.²

¹ See Leth-Sørensen (1995) for further details about the IDA database. Data are described on www.cls.dk.

² We consider for each worker the November establishment attachment from which he or she earned the most during a given year. IDA registers up to 3 attachments for each worker in each year. However, most work

The annual matching of the individual and the plant due to the unique identification makes it possible to associate individuals with both plant- and individual-specific characteristics on a large scale, providing a unique chance of analysing the individual factors behind the flows and of answering the question whether certain employees are more likely to move towards one destination than others.

The individual characteristics included in the analysis are the classical variables of gender, age and occupation but also the policy variable, replacement ratio. The replacement ratio reflects the compensation to which an individual is eligible when unemployed relative to the income earned in the job, which she/he left. The replacement ratio is calculated on an individual basis and depends on the labour market history and the previous wage of the individual. The replacement ratio is 90% for low-wage rates and is reduced for pay levels above a certain maximum.³

In this paper, we also make explicit use of the plant characteristics i.e. sector and size. Furthermore, we include indicators for the plants' employment status. The indicators are constructed as a series of categories indicating if the plant is declining, expanding or staying constant in terms of employment together with an indicator for closing plant. These variables are interesting because the nature of the separation is believed to be an important signal when looking for a new job because it describes the job search condition, see Gibbons and Katz (1991).

checking the match validity has been carried out using primary November attachments. Hence, we ignore multiple job holding. Together, these omissions on average constitute 4.8% of all man-years of employment.

³ See Andersen et al. (2001) for how UI-benefits are calculated.

One factor blurring the true turnover is spurious job creation and destruction resulting if firms change their formal identity in the registers from one year to the next. Statistics Denmark has corrected changes in identity in the cases where it was obvious to Statistics Denmark that a real change had not happened. The main indicator used for the correction is the fraction of the workforce remaining employed. These corrections affect less than 5% of all firms.

3. Magnitude of flows

In this section, we analyse the magnitude of flows and their distribution over destination states. The concepts and definitions used are in accordance with the conventional definitions suggested by Davis et al. (1996). A separation in time t (sep_t) is defined as a situation where the person is employed at a plant in time t but not employed at the same plant in time $t+1$, and a stayer (s_t) is a person who is employed at the same plant in both periods. Similarly, a hire in time t (h_t) is defined as a situation, where the person is in the workplace in t but not in $t-1$. When calculating the proportion of separations, the denominator is chosen to be the average employment in year t . This is calculated as the number of stayers plus the average of separations and hires.

$$Sep_t = \frac{sep_t}{\frac{1}{2} * (sep_t + h_t) + s_t}$$

In Table 1, we have summarised annual transitions over all 15 years. The basic facts are: 29% of all employments in a given year in the private sector end in a separation. Out of the total level of separations two thirds move to a new job (according to the industry classification, NACE or ISIC codes), thus one third of all separated is found without a job the following year. Among the latter group a little more than half (18% of all separations) are found among

the unemployed in the subsequent year. One fifth (6% of all separations) are found in a flow to neither unemployment nor transfer income, but just out of the labour force. One tenth (3% of all separations) have started an education and only a minor part corresponding to one tenth of the non-employed is found to have left employment because of retirement.

Table 1 here

3.1. Discussion

Of the job-to-job changes which constitute 69% of all job separations, 44%-points (almost 2/3) are due to transitions to other firms in the private sector. While this is hardly surprising, it may be more surprising that 12% of all transitions are relocations from one plant to another within the same firm. Sector changes are made by only 7% of all leaving a private sector job. There is a small flow into the category “no physical workplace” which covers those who do not have a daily working place other than their home i.e. salespersons working from home or consultants who are not self-employed. The flow into self-employment constitutes 4%-points of all separations.

Most of the 31% who move to no job become unemployed. These are most likely to receive unemployment benefit in the Danish context. 6% of all separating or 1/5 of the job-to-no-job leavers are categorised as out of the labour force, which is basically defined as the residual group. Those are most likely receiving sickness benefit or are on maternity leave. A relatively small group - 3% of all separators - go to education, while 2% turn themselves into the early retirement program available for 60 years plus. This is called post employment wage. Many choose this early retirement plan and therefore fewer are categorized as on pension. Together

these “natural causes” for separations account for only 3% of all separations among the 18-66 years old. This measure does, however, not account for the flow from unemployment and out of the labour force into retirement and post employment wage.

The new labour market program, NLP, has its own category. NLP was introduced in 1994. In the beginning, NLP mainly covered a leave scheme for employed and unemployed. One of the most popular leave programs was an extended maternity leave. To a certain degree, participation was an alternative to unemployment because unemployed could also take leave, see Westergaard-Nielsen (2001). These programs became very popular, so popular that almost 1.5% of the entire labour force took part each of the first years.

4. The cyclicity of flows

So far, we have been looking at the magnitude of flows. In this part, we will look at the cyclicity of the decomposed flows. First, Table 2 shows that separations are negatively correlated with changes in GDP and the coefficient of correlation for the whole period is -0.39. The level of these separations in a single year is between 26 and 33% with an absolute peak in 1987, 2 years after GDP growth peaks in 1985 (see Figure 1).

Figure 1 here

Table 2 further shows that it is important to distinguish between destination states when modelling cyclical flows because the correlations with GDP differ not only in magnitude but also in sign. This situation is illustrated by the transitions from the private sector to a new job in the private sector where the coefficient of correlation is 0.21 and transitions from the

private sector to the public sector where the correlation is -0.22 . So even within the job-to-job flows large heterogeneity can be found. This observation is a clear indication for the attractiveness of working in the private sector once you have been employed in that sector.⁴

More pronounced is the negative correlation between reallocations within the same firm and GDP. This observation is highly related to the reallocation, plant, and firm closure discussion we make in section 6. In this section we find that firms are more likely to make use of reallocations if they experience a plant closure. The link between reallocations and the business cycle is then made through a better understanding of the cyclicity of plant closures.

Table 2 here

The category ‘no physical workplace’ is weakly pro-cyclical showing that the number of people who takes up this semi-self-employment is increasing in good times. This intuitive result does not carry over to the transitions into self-employment, which is showing a negative correlation with dGDP. A possible explanation for this correlation is that self-employment is considered as an alternative to unemployment. In technical terms, the present value of self-employment is below what can be achieved in a job in the private sector but above the present value of becoming unemployed. Adding to this explanation is the existence of a program that for the whole period subsidized unemployed who started their own business. The required unemployment spell was 3 months and the subsidy consisted of 50% UI-benefits for a 3-year-period.

Figures 2 and 3 here

⁴ This finding is supported by the fact that once employed in the private sector it is eight times as likely that you stay in the private sector compared to moving into the public sector, see Table 1.

Figures 2 to 10 illustrate the correlation coefficients from Table 2. Figure 2 shows that a larger part of the separated leave for jobs in different firms at the end of an upswing. Figure 3 shows that the re-allocation between plants in the same firm increases when the business cycle goes down, as is clearly the case in 1986-87.

Figure 4 illustrates the anti-cyclical flow to the public sector. Figure 5 shows the cyclical flow into self-employment. There is a general hump covering the years 1984-85 to the beginning of the 1990s. This is closely related to the existence of a subsidy to “self-starters”, Westergaard-Nielsen (2001).

Figures 4 and 5 here

For the job-to-unemployment separations the anti-cyclical flow is highly pronounced, as seen in Figure 6. Here the correlation is -0.64 . The years with low economic growth from 1987 to 1993 result in an increasing flow to unemployment. Only the strong growth in 1994 seems to be able to break the upward trend in the flow into unemployment. It is also plausible that the introduction of NLP in 1994 helped reducing the flow into unemployment. The development in 1995 suggests that NLP plays a role in redirecting the unemployed, since the two curves are positively correlated for the first time. In fact, Figure 10 shows that NLP “absorbed” .015% of the labour force or 5% of all separations in 1994 and a little less in 1995. However, adding these numbers to the flow into unemployment does not by any means explain the reduction in unemployment in 1994 and 1995 but it makes it less abrupt. Westergaard-Nielsen (2001) discusses the effects of NLP and finds that it is not the main explanation for the subsequent reduction of unemployment.

The relatively small number of people leaving employment to start an education is found to be clearly counter-cyclical (Figure 7). The counter-cyclical nature of the flows is supported by a correlation coefficient of -0.31. It is less likely that training and education schemes under various labour market policies are responsible for the counter-cyclical nature because the general rule until NLP was introduced in 1994 was that a person should have been unemployed for 21 out of the last 24 months before he could be placed on a programme. Thus, the most likely explanation of the anti-cyclical nature is that the foregone earnings in a human capital function increase in periods with economic growth and decrease in slumps and that makes people deselected and selecting education accordingly.

Figures 6 and 7 here

The flow into “Out of labour force” is found to be clearly anti-cyclical according to Figure 8 with a correlation coefficient of -0.64. The strong correlation indicates that the economic situation is important to the decision whether to leave the workforce. A possible explanation is that if a person suffers from quick depreciation of human capital when becoming separated, the knowledge about the business cycle may enforce the decision permanently to leave the workforce. Furthermore, individuals who plan to leave the workforce on a temporary basis may plan to do so in slumps because the opportunity costs are lower in this period.

Transition into old-age retirement and disability-conditioned retirement (together called pension) in Figure 9 appears to be vastly a-cyclical. The pension curve seems to be influenced by a reform in 1984 which allowed more people to get an early pension (Figure 9). The flow into post employment wage (also Figure 9) shows a moderate negative cyclical behaviour. Both flows are somewhat influenced by new programs in 1992, 1993 and 1994 that allowed

unemployed members of the UI system who were between 50 and 60 years of age to leave the labour market with a benefit slightly below the UI benefit.

Figures 8, 9 and 10 here

5. Individual flows and their determinants

In the following, the analysis is performed on an individual level investigating the determinants for the flows we have looked at in the first part of the paper. The intention is to answer the question whether a particular group of people is relatively more likely to end up in a particular destination state after a job separation. The results from this analysis provide important insights into the labour market. As an example, it identifies the individuals marginalized on the labour market i.e. individuals moving from employment to unemployment or out of the labour force. Also, looking at the job-to-job transitions provides clear indications for the skills demanded in the market because labour demand is a necessary condition for this type of transitions.

The theoretical framework used in the analysis is a probabilistic choice model where the individuals i with characteristics X_i face the abstract finite choice set C . At time t each individual i will select one of the mutually exclusive alternatives $j \in C = \{0, 1, 2, \dots, J\}$. The random utility assigned to destination state j by individual i at time t is

$$U_{jit} = X_{it}' \beta_j + \alpha_i + \varepsilon_{jit}$$

where β_j is the “prices” associated with each state, α_i represents individual effects and ε_{jit} is an error term. The individuals are assumed to make selections that maximize their utility, and hence the probability that alternative j is chosen by individual i is

$$P_{ij} = \Pr[U_{ij} > U_{ij'}, \forall j' \neq j]$$

With the above representation and the assumption that the error terms are independently and logistically distributed conditional on α_i and X_{it} , the empirical probabilities can be expressed as⁵

$$P_{ij} = \frac{1}{1 + \sum_{j>0} \exp(X_{it}' \beta_j + \alpha_i)}, \quad j = 0$$

$$P_{ij} = \frac{\exp(X_{it}' \beta_j + \alpha_i)}{1 + \sum_{j>0} \exp(X_{it}' \beta_j + \alpha_i)}, \quad j = 1 \dots J$$

Applying the technique developed by Chamberlain (1980), the method of conditional maximum likelihood can be used to estimate the β 's in the multinomial logit model consistently.

The results from the estimated multinomial logit model are shown in the Appendix.⁶ Because of the normalisation of the coefficients, a direct interpretation of the raw regression coefficients is difficult and instead the method of predictions is applied to evaluate the model.

The method requires a specification of the characteristics for the type of interest, and hence

⁵ See McFadden (1974) for details.

⁶ Due to the burdensome computations, the data used in the estimation are limited to a random sample of 10% of the total 6 million separations registered in the IDA database. The number of observations in the regression is still above 600,000, so it is believed that this limitation does not cost any loss of generality.

we are constructing detailed stereotypes and predicting the distribution of transition probabilities over the destination states.

Table 3 here

5.1. The age and gender effect

In a first set of predictions, we evaluate the effects of gender and age on the distribution across destination states. The intention is to illustrate the different mobility patterns of different age and gender groups. The reference person is low paid, white collar and working in a medium-size manufacturing workplace with constant employment and an environment experiencing no macroeconomic growth. The transition probabilities are presented in Table 3.

There is a clear tendency for both men and women that senior workers given a separation from a workplace are less likely to become reemployed compared to younger workers. The transitions into unemployment (around 25% of all separations) are also at a relatively low level for senior workers. In fact, it is lower for the senior workers than for the group of middle-aged workers, indicating that the transitions from employment for the senior workers will mainly have destination states out of the labour market. Because the pure out of the labour force state is fairly constant over age groups, the important destination states for senior workers are post employment wage and pensions. These states are found to account for as much as 40% of all separations among senior workers.

The picture for the youngest workers is different in many respects. First of all, the reemployment transitions are large and account for more than 60% of all separations. This

higher reemployment probability is probably due to on-the-job search where the young workers are searching for new jobs that are dominating the initial match.⁷ Education is the destination state that in particular makes the youngest workers different from the other age groups. Education accounts for around 4% of all transitions for young men and women. The high reemployment probability and the heavy use of education explain why the youngest age group has the lowest probability of ending up in unemployment.

In contrast to the two previous groups, the middle-aged workers only make little use of the non-employment states. The only non-employment state of significant size is the out of labour force state (accounts for 5% of all separations). However, this is not different from the other age groups. For this reason, the middle-aged workers experience a larger level of transitions into unemployment, which is the only regular alternative to employment. In recent years, however, this picture is not as clear-cut, because the new labour market policy has become an option or an alternative to unemployment. The dominating group entering the new labour market policy was found to be middle-aged women (result not shown) which in the present analysis is the group experiencing spells of unemployment most frequently.

There are three observations that strike the eye when looking for gender differences. Firstly, the reemployment probability is almost 10% lower for women relative to men. Secondly, women have a higher probability of ending up in the out of labour force state which for the younger women is explained mainly by maternity leave and extended child care leave, but is unexplained for the other age groups. Finally, sector changes are more pronounced for women. This finding may be explained by a relatively higher public-sector demand for female workers or relatively higher risk aversion of women. Additionally, it is found that women are

⁷ This observation is established in the literature by Topel and Ward (1992).

generally more attracted by employment in the public sector. The authors point at these potential explanations without making any conclusions.

6. Policy implications

In the estimated multinomial logit regression, two policy instruments were included i.e. dGDP and the replacement ratio. These instruments can be used to simulate a hypothetical reform of the incentives to the worker with the effects of a push to the overall growth rate of the economy. It is important to notice the different nature of the two hypothetical policy interventions or shocks. The growth policy or shock is modelled as a one period increase in growth, and hence the resulting change in flows is only of temporary nature. The structural policy, on the other hand, can be thought of as a permanent change. The elasticities for the policy changes can be seen in Table 4.

Table 4 here

First, we simulate the impact of an exogenous shock, which increases the growth rate in the economy in a single year. The improved economic condition has very desirable consequences for the economy because it reduces unemployment and keeps workers longer on the labour market (reduced transition into pensions and the out of the labour force state). On top of this, it is testing labour market availability of the unemployed workers which has the consequence that some of the workers “hiding” in the UI system without truly being available now leave for the post employment wage program.

The growth in GDP has some negative consequences as well, but potentially these are only of a temporary nature. The flows into education and self-employment are reduced substantially which is naturally explained by an opportunity cost argument. Finally, the increased opportunities in the private labour market due to the improved economic conditions result in increased job flows in the private sector and flows into consultancy and sales activities and reduce reallocations within the firm and sector changes.

In a second simulation, we investigate a structural policy, which directly changes the economic incentives of the agents by lowering the maximum level of unemployment benefits. A reduction of the benefits is intended to motivate the workers not to choose the unemployment state, but as correctly pointed out by [Atkinson and Micklewright \(1991\)](#) a reduction in the “value” of the unemployment state potentially increases the transitions into other undesirable non-employment states.

The consequence of a reduction in the unemployment benefits is that both the replacement ratio and the benefits in post employment wage are reduced since the latter is compensated with UI-related benefits. So, the structural change makes it clearly less attractive to depend on any labour-market-related support, and as a natural consequence of the policy we empirically observe that transitions into unemployment and PEW are reduced. Within this context it is interesting to observe that the transitions into destination states that can be seen as alternatives to PEW and unemployment increase i.e. self-employment, pension (health-related early retirement) and out of the labour force, so maintaining an uncertain job career has certainly become less attractive.

Reemployment probabilities in the private sector and within the same firm increase as a consequence of the lower UI benefits. This is a result of the lower present value of the unemployment state, which is driving the reservation wage of the worker down. The negative effects of the reduction in UI benefits on transitions into the public sector may potentially be explained by uncertainty associated with sector changes whereas the negative effect of transitions into education is left unexplained.

In a third simulation relevant for policy makers, we use information about the employment situation of the workplace from which the person is separating because these conditions may be an important signal for the worker when searching for future employment, see Gibbons and Katz (1991). We have categorized the workplace in the following four groups: workplaces expanding more than 10%, less than +/- 10%, reducing more than 10% or closing. These signals show to be important.

Rescuing closing firms has had a high priority in some countries. Most often the reason has been a fear that workers laid off from closing companies had difficulties finding new employment. This policy had widespread support in Europe in the 1980s. Later it has been abandoned mostly because of the introduction of the single market in EU. However, some countries have practised huge placement and early retirement programs when big firms closed. Storrie (1993) describes how this policy has been followed in Sweden. One of his results is that people caught in one of the big plant closures on the Swedish West Coast actually do much better than predicted. Since Denmark has never been very active in immediate assistance for displaced workers, it is highly interesting to see that somebody separating from a closing workplace is actually less likely to become unemployed than a person separating from an expanding or contracting firm (see Table 5). Our predictions

evaluated for middle-aged men and women show that the probability of ending up in unemployment is $\frac{2}{3}$ for a person being dismissed from a closing workplace compared to persons separating under other circumstances (.24 against .37 for women and .17 against .28 for men). This is rather remarkable because we know that those involved in a plant closure are all laid off while an unknown fraction of those separating from other workplaces are actually quitting. Part of the explanation is, however, closely related to signalling (Spence, 1973). The explanation is that plant closures dismiss highly profitable workers together with less profitable workers, while single lay-offs are believed to affect mostly less profitable workers. The phenomenon is also described as lemons and non-lemons by Gibbons and Katz (1991). By profitable workers we mean workers whose contribution to overall production is higher than the wage costs. Furthermore, people who are involved in a plant closure will have an interest in signalling the circumstances, because they can use it as an advantage compared to the average worker not dismissed in a plant closure. Other workers do not have the same interest. Finally, another argument is that workers in plant closures might get a warning earlier than workers involved in **single** lay-offs. Labour protection laws prescribe early notice in the case of mass dismissals, where single dismissals require no or short notice in Denmark, see Andersen et al. (2001).

The other set of findings concerns the probability of being re-employed in a new or in another plant owned by the same firm. For men leaving expanding and steady workplaces, the re-employment probability is between 54 and 60%. For men leaving closing plants, it is 68% and for reducing workplaces, it is somewhat lower. These numbers are lower for women, but there is the same difference between plant statuses. However, our results with respect to the probability of getting new employment in the private sector (column 1) show that the main reason for these differences is that employees from closing and contracting plants are more

likely to get transferred to other parts of the same firm. Correcting for within firm transfers, people involved in plant closures are found to be only marginally better in getting new employment compared to other groups of people separating (4 percentage points for men and 7 percentage points for women). Thus, the seemingly better employment prospects for people involved in plant closures are largely due to a higher probability of being transferred to other parts of the firm. However, unemployment is still lower for the group involved in plant closures, because they are less likely to drift to other statuses. So even after having controlled for the group who gets re-allocated, there is small part of the non-lemon explanation left. But it is remarkable that most of the difference between persons depending on the cause for the separation is actually due to the re-allocation within the same firm. This indicates that the information on quality and performance is mostly conveyable within the firm but is more difficult to transfer to third parties.

Another result is that those from plant closures are not more likely to become employed in the public sector, as would be the case if the public sector actively provided jobs for employees from closed firms. This clearly fits with the traditional policy in Denmark, where the state never has been active in the re-allocation of employees unlike Sweden.

Table 5 here

7. Conclusion

This paper has analysed individual job separations and flows from the private sector at a highly differentiated level. The results are believed to be valid for other liberal labour markets though each has its own distinct features. The main differences between the Danish and other

liberal labour markets are the high replacement ratios in Denmark and the existence of a close social network. Our results also demonstrate that under these circumstances turnover is high for all age groups unlike heavily regulated labour markets, where turnover tends to be concentrated at the younger age groups.

In the first part of the paper, we study individual job-separations and flows from the private sector using the IDA database. We identify 11 different destination states and show the full distribution of labour market flows and their cyclical behaviour. The findings in this section confirm that the level of separations taking place each year is high and emphasises that there is a substantial risk of becoming unemployed given a job separation takes place.

To learn more about the nature of the separations, an individual fixed-effect multinomial logit is estimated. Individual characteristics such as age, gender, occupation and replacement ratio are included in the analysis together with the workplace characteristics of size, sector and employment conditions. Also the business cycle effects are taken into account. We find that variables of all 3 classes are important in explaining the individual behaviour and that there is large heterogeneity both within and between destination states.

In a policy section, we compare the effects of a hypothetical change in the UI payment with a push to the overall growth of the economy. We show that growth and structural policies have different consequences for the economy but both have the desirable feature of reducing transitions into unemployment. A third simulation deals with signalling. It is found that employees involved in plant closures are generally more likely to get a new job than employees who have been laid off under other circumstances. Similar findings are usually explained by a lemon argument. However, when we control for those workers who are re-

allocated to a different plant within the same firm, the finding is much less pronounced indicating that favourable signals on experience and performance are best conveyed within the firm.

Appendix

Fixed-effect multinomial logit for flows out of private sector employment.

	Stay with the same firm ¹⁾	Public sector	No physical workplace	Self-employment	Unemployment
Woman (= 1)	-0.440 (0.010)	0.610 (0.012)	-0.304 (0.020)	-0.335 (0.018)	0.488 (0.008)
Age 18-30	-	-	-	-	-
Age 31-50	0.4276 (0.010)	-0.087 (0.012)	-0.189 (0.020)	1.077 (0.017)	0.254 (0.008)
Age 51-	0.919 (0.015)	-0.227 (0.012)	-0.019 (0.036)	1.284 (0.025)	1.082 (0.012)
Replacement ratio ²⁾ 70-90%	-	-	-	-	-
Replacement ratio 50-70%	0.207 (0.011)	-0.410 (0.013)	-0.638 (0.022)	-0.156 (0.019)	-0.026 (0.008)
Replacement ratio <50%	0.148 (0.013)	-0.642 (0.017)	-0.882 (0.026)	0.018 (0.019)	-0.292 (0.011)
Workplace size < 20	-1.504 (0.016)	-0.300 (0.023)	-0.923 (0.032)	0.785 (0.037)	-0.054 (0.016)
Workplace size 20-99	-0.852 (0.015)	-0.340 (0.023)	-0.666 (0.032)	0.109 (0.038)	-0.198 (0.016)
Workplace size 100-499	-0.400 (0.016)	-0.213 (0.024)	-0.349 (0.034)	-0.054 (0.040)	-0.117 (0.016)
Workplace size > 500	-	-	-	-	-
Reducing workplace	0.575 (0.011)	0.201 (0.013)	-0.046 (0.021)	-0.173 (0.018)	0.088 (0.009)
Expanding workplace	-0.039 (0.016)	-0.075 (0.016)	0.051 (0.026)	-0.119 (0.022)	-0.102 (0.011)
Closing workplace	0.933 (0.013)	0.580 (0.019)	0.439 (0.025)	-0.279 (0.022)	-0.585 (0.012)
No change in employment	-	-	-	-	-
.dGDP	-0.042 (0.003)	-0.058 (0.003)	-0.001 (0.005)	-0.039 (0.004)	-0.111 (0.002)
Occupation dummies	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes

Note: Standard errors are in parentheses. The reference category is stay in private sector. A replacement ratio category consisting of individuals with no previous wage e.g. young individuals is not presented. Number of observations is 616745 and the Pseudo R2 is 0.1277.

¹⁾ Individuals in this category have the same employer but a different physical workplace.

²⁾ In the calculation of the replacement ratio, we have ignored the unemployment insurance degree i.e. full-time, part-time or no insurance.

Fixed-effect multinomial logit for flows out of private sector employment (continued)

	Education	PEW	Pension	Out of the labour force	New Labour Policy
Woman (= 1)	0.180 (0.017)	-0.112 (0.026)	0.214 (0.032)	0.676 (0.013)	1.724 (0.044)
Age 18-30	-	-	-	-	-
Age 31-50	-1.974 (0.035)	20.717 (-----)	2.945 (0.063)	0.439 (0.014)	0.327 (0.037)
Age 51-	-4.400 (0.250)	28.646 (0.177)	5.379 (0.062)	1.534 (0.018)	-0.291 (0.086)
Replacement ratio ¹⁾ 70-90%	-	-	-	-	-
Replacement ratio 50-70%	-0.793 (0.022)	0.086 (0.025)	-0.843 (0.035)	-0.377 (0.015)	0.530 (0.040)
Replacement ratio <50%	-0.950 (0.029)	-0.528 (0.030)	-0.430 (0.035)	-0.273 (0.017)	0.280 (0.051)
Workplace size < 20	-0.567 (0.031)	-0.670 (0.036)	-0.321 (0.049)	-0.241 (0.024)	-0.404 (0.070)
Workplace size 20-99	-0.514 (0.032)	-0.609 (0.034)	-0.521 (0.050)	-0.392 (0.024)	-0.386 (0.069)
Workplace size 100-499	-0.227 (0.034)	-0.420 (0.034)	-0.387 (0.052)	-0.254 (0.026)	-0.142 (0.070)
Workplace size > 500	-	-	-	-	-
Reducing workplace	0.071 (0.019)	-0.837 (0.024)	-0.434 (0.031)	-0.192 (0.014)	-0.267 (0.041)
Expanding workplace	-0.035 (0.023)	-0.176 (0.031)	-0.153 (0.040)	-0.084 (0.018)	-0.013 (0.047)
Closing workplace	-0.346 (0.028)	-1.762 (0.041)	-0.861 (0.043)	-0.446 (0.020)	-1.02 (0.073)
No change in employment	-	-	-	-	-
.dGDP	-0.096 (0.005)	-0.043 (0.006)	-0.059 (0.008)	-0.076 (0.004)	1.10 (0.015)
Occupation dummies	Yes	Yes-	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes

Note: Standard errors are in parentheses. The reference category is stay in private sector.

¹⁾ In the calculation of the replacement ratio, we have ignored the unemployment insurance degree i.e. full-time, part-time or no insurance.

References

- Abowd, J.M., P. Corbel and F. Kramarz, 1996, The Entry and Exit of Workers and the Growth of Employment: An analysis of French Workplaces, NBER Working Paper 5551, National Bureau of Economic Research, Cambridge (MA), USA.
- Albæk, K. and B.E Sørensen, 1998, Worker and Job Flows in Danish Manufacturing, 1980-1991, *The Economic Journal* 108, 1750-1771.
- Anderson, P.M. and B.D. Meyer, 1994, The Extent and Consequences of Job Turnover, *Brookings Papers on Economic Activity: Microeconomics*, 177-248.
- Andersen, T.M., B.D. Dalum, H. Linderoth, V. Smith and N. Westergaard-Nielsen, 2001, *The Danish Economy – An International Perspective*, Copenhagen.
- Atkinson, A. and J. Micklewright (1991), Unemployment Compensation and Labor Market Transitions: A Critical Review, *Journal of Economic Literature*, Vol 29, No 4, pp 1679-1727.
- Blanchard, O.J. and P. Diamond, 1990, The Cyclical Behavior of the Gross Flows of U.S. Workers, *Brookings Papers on Economic Activity*, 85-155.
- Chamberlain, G., 1980, Analysis of Covariance with Qualitative Data, *The Review of Economic Studies*, Vol. 47, p. 225-238.
- Davis, S.J. and J. Haltiwanger, 1992, Gross Job Creation, Gross Job Destruction and Employment Reallocation, *Quarterly Journal of Economics* 107, 819-863.
- Davis, S.J., J. Haltiwanger and S. Schuh, 1996, *Job Creation and Destruction*, MIT Press, Cambridge.
- Hamermesh, D.S., W. Hassink and J. Van Ours, 1996, Job Turnover and Labor Turnover: A Taxonomy of Employment Dynamics, *Annales d’Economie et de Statistique* 41-42, 1-40.
- Gibbons, R. and L. Katz, 1991, Layoffs and Lemons, *Journal of Labour Economics*, Vol. 9, Issue 4, 351-380.
- Leth-Sørensen, S., 1995, The IDA database – A Longitudinal Database of Establishments and their Employees, Statistics Denmark, IDA Project.
- McFadden, D.L., 1974, Conditional Logit Analysis of Qualitative Choice Behavior, In P. Zarembka (ed.), *Frontiers in Econometrics*, p.105-142, Academic Press: New York.
- Spence, M., 1973, Job Market Signalling, *Quarterly Journal of Economics*, Vol. 87, 355-374.
- Storrie, D.W., 1993, *The Anatomy of a Large Swedish Plant Closure*, Göteborgs Universitet.
- Topel, R.H. and M.P. Ward, 1992, Job Mobility and the Careers of Young Men, *The Quarterly Journal of Economics*, Vol. 107, Issue 2, 439-479.
- Westergaard-Nielsen, N., (2001), 20 Years of Labour Market Policies in Denmark, in: S. Ilmakunnas, eds., *Labor Institutions and Employment*, Government Institute for Economic Research, Helsinki.

Table 1. Decomposition of separations on destination states in the private sector, 1980-95.

	Separations	
	% of all employment	% of all separations
Total	29.07 (1.47)	100
Job to job	20.02 (1.91)	69
<i>Of which</i>		
New plant in the same firm	3.42 (0.44)	12
New firm in the private sector	12.75 (1.76)	44
Public sector	2.05 (0.24)	7
No physical workplace	0.74 (0.23)	2
Self-employment	1.06 (0.10)	4
Job to no job	9.05 (1.16)	31
<i>Of which</i>		
Unemployment	5.36 (1.07)	18
Education	0.92 (0.17)	3
Post employment wage	0.66 (0.08)	2
Pension	0.32 (0.04)	1
Out of labour force	1.62 (0.16)	6
New Labour Program	0.17 (0.44)	1

Note: Standard errors are in parentheses. The new labour market program (NLP) was introduced in 1994 and accounts for 4.98% of the separations in 1994 and 3.95% in 1995. The NLP separations enter the decomposition in the same way as the other variables but are highly underrepresented since they occur for only two years.

Table 2. Correlations with dGDP.

Correlations	Contemporaneous
Total separations	-0.39
New plant in the same firm	-0.52
New firm in the private sector	0.21
Public sector	-0.22
No physical workplace	0.11
Self-employment	-0.30
Unemployment	-0.64
Education	-0.31
Post employment wage	-0.13
Pension	-0.19
Out of labour force	-0.64

Note: Correlation between New Labour Market Programs and dGDP cannot be calculated because the programs started in 1994.

Table 3: Distribution of transitions for different age and gender groups.

	New employment in private sector	Stay with the same firm	Public sector	No physical workplace	Self- employ- ment	Unemploy- ment	Education	PEW	Pension	Out of the labour force
Woman, Junior	.44	.03	.08	.02	.01	.32	.04	0	0	.05
Woman, Middle-aged	.39	.05	.06	.02	.03	.37	.01	0	.02	.07
Woman, Senior	.15	.03	.02	.01	.01	.33	0	.30	.07	.08
Man, Junior	.54	.04	.05	.04	.02	.24	.04	0	0	.03
Man, Middle-aged	.48	.06	.04	.03	.04	.28	.01	0	.02	.04
Man, Senior	.18	.04	.01	.01	.02	.24	0	.39	.06	.05

Note: Standard characteristics are: Employment in manufacturing, white collar, medium-sized firm, no employment change in workplace, high replacement ratio and no change in GDP.

Table 4. Elasticities for changes in transition probabilities calculated from policy simulations.

	GDP increased	Unemployment benefits reduced
Same firm	-1.648	0.017
Another firm in the private sector	2.574	0.065
Public sector	-3.018	-0.094
No physical workplace, work from home	2.675	-0.110
Self-employed	-0.904	0.222
Unemployment	-7.737	-0.156
Education	-6.124	-0.030
Post employment wage	0.136	-0.443
Pension	-1.737	0.384
Out of labour force	-4.372	0.127

Table 5: Probabilities of transitions to each destination state given different separation conditions.

	New em- ployment in private sector	Stay with the same firm	Public sector	No physical workplace	Self- employ- ment	Un- employ- ment	Education	PEW	Pension	Out of the labour force
Woman, Closing workplace	.46	.14	.04	.03	.02	.24	0	0	.01	.05
Woman, Reducing workplace	.41	.05	.06	.02	.02	.35	.01	0	.01	.07
Woman, No change in employment	.39	.05	.06	.02	.03	.37	.01	0	.02	.07
Woman, Expanding workplace	.40	.08	.05	.02	.02	.35	.01	0	.01	.06
Man, Closing workplace	.52	.16	.03	.05	.04	.17	0	0	.01	.03
Man, Reducing workplace	.50	.06	.04	.03	.04	.26	.01	0	.01	.04
Man, No change in employment	.48	.06	.04	.03	.04	.28	.01	0	.02	.04
Man, Expanding workplace	.49	.11	.03	.03	.04	.26	.01	0	.01	.04

Note: Standard characteristics are: Middle-aged, employment in manufacturing, white collar, medium-sized firm, high replacement ratio and no change in GDP

Figures

Figure 1. Separations and changes in GDP

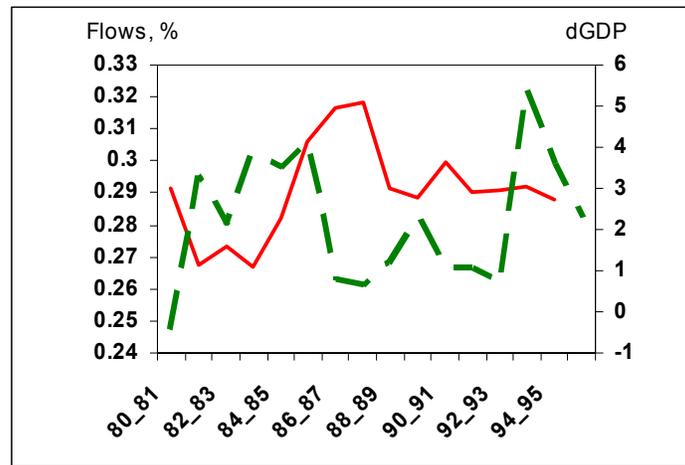


Figure 2. Separations to different firms

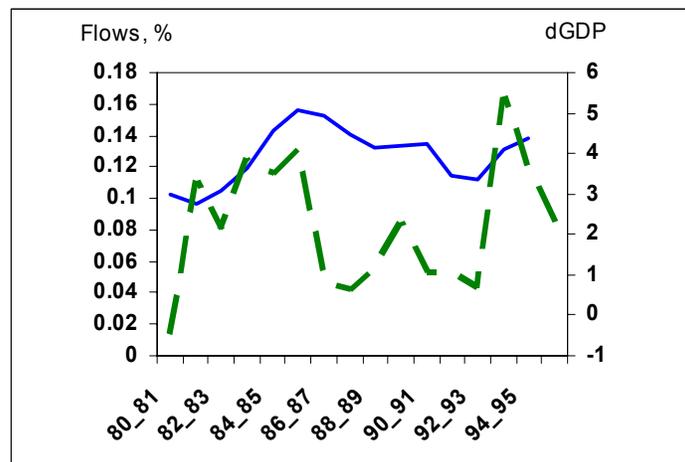


Figure 3. Separations within same firm.

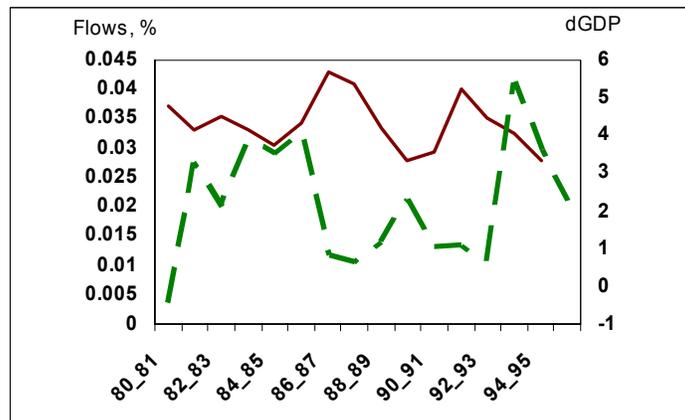


Figure 4. Separations to Public Sector

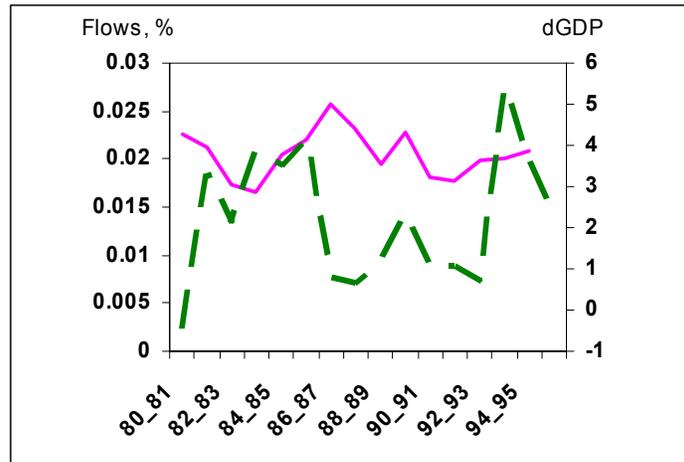


Figure 5. Separations into self employment

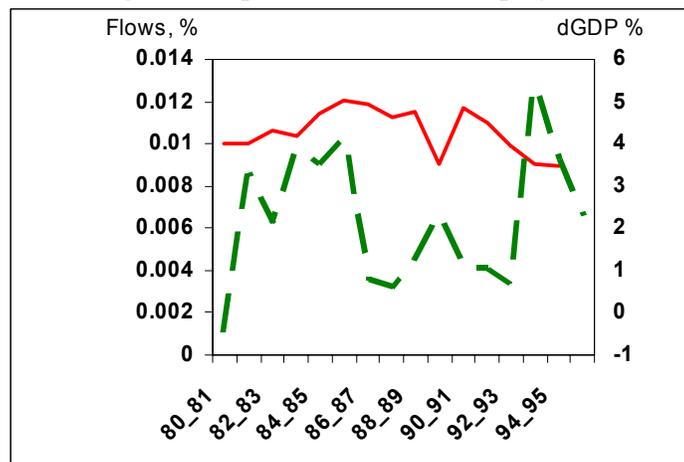


Figure 6. Separations into unemployment

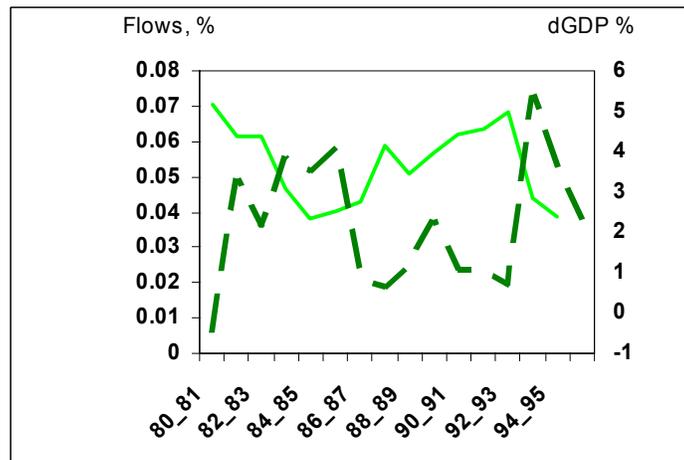


Figure 7. Separations into education

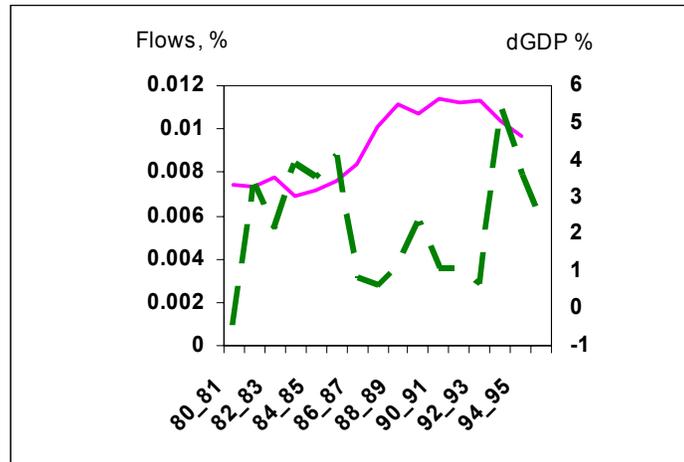


Figure 8. Separations out of labour force

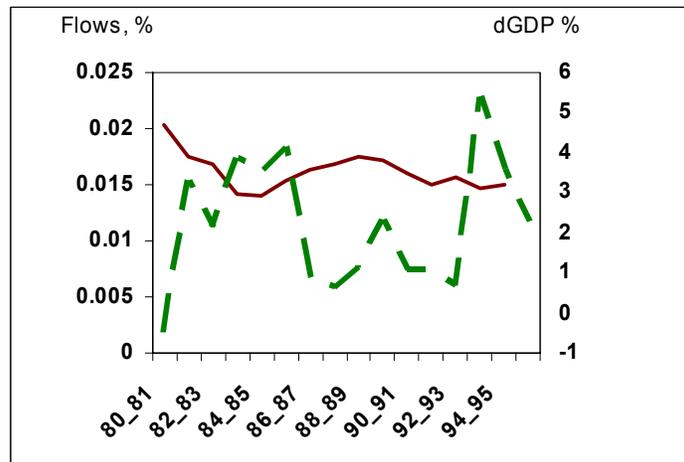


Figure 9. Separations into PEW and retirement

