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Employment Protection and the
Consequences for Displaced Workers:
a Comparison of Belgium and Denmark

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**Employment protection and the consequences for displaced
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1. Introduction.

Belgium and Denmark offer marked contrasts in many of their labour market institutions. Belgium has long been considered by many as exemplifying the economic problem known as Eurosclerosis. Indeed, Belgium did have (and to some extent still has) almost all of the negative institutional characteristics often associated with poor economic performance: high job protection, rigid wages and generous unemployment insurance compensation. Denmark, on the other hand, has long been considered as an example of a country that has successfully achieved a good balance between social protection and economic growth. Below we shall discuss the differences between the two countries in detail but in Table 1 we present some of the features of the two labour markets along with those of a selection of other countries, to provide some context. These rankings are taken from the 1997 global competitiveness report (World Economic Forum, 1997). The Table gives the ranking (out of 53 countries) for various labour market indicators. In each case a higher ranking (closer to 1) means 'more advantageous for employers' (as conventionally seen - alternatively, a high score can be seen as 'bad for workers'). Of particular note is the fact that Belgium consistently has scores that indicate 'negative' institutional characteristics. On the other hand, Denmark is much more mixed. For example, it is seen as having generous Unemployment Insurance (UI) provisions but it also has the lowest impediments to hiring and firing (lower even than Singapore or Hong Kong).

Belgium and Denmark are both small open economies whose primary trading partner is Germany. They also both have a relatively generous social safety net. The major difference between their labour markets is the higher firing costs in Belgium. Thus it is very tempting to compare the outcomes of workers in the two countries who are displaced from a long tenure job to identify how these outcomes differ and whether they can be attributed to the differences in firing provisions. This comparison is made even more attractive by the availability of two comparable administrative data sets describing both the Belgian and Danish labor markets. In this work, we will use these data sets to compare worker displacement and worker adjustment to displacement in Belgium and Denmark.

2. Labour market institutions.

Appendix A provides an extended discussion of labour market institutions in Belgium and Denmark. Here we provide a brief description.

2.1 Employment protection.

Belgian law recognizes the basic principle of employment at will, so that only in a few cases (union representatives, pregnant women and workers on parental leave, for example) does an employer have to have a just cause to justify the dismissal of an employee. However, laying off workers can have high costs since Belgian law guarantees workers long notice periods and in some cases generous mandatory severance payments. The notice periods for blue collar workers are relatively short: 4 and 8 weeks for workers with less than 20 years of service and those with more than 20 years, respectively. White collar workers (who

represent about 40% of the workforce) have to be given much longer period of notice. White collar workers are given three months of notice plus three months per completed five years of seniority. For high wage white collar workers, these are lower bounds. The actual period of notice has to be set in agreement between the employer and the employee. When no accord can be reached, the length of notice is set by the Labor Courts. Blanpain (1994) estimates that precedents tend to show that the length of notice Courts grant to these high paid employees is a function of age, specialization, tenure and wage. They can go as high as 36 months. Of course, all these restrictions do not apply during trial periods (generally two weeks for blue collar workers, but up to six months for white collar workers). In addition to notice, Belgian workers (blue and white collar workers) are given large severance payments in case of a plant closure. These payments amount to roughly one months salary per year of seniority, plus some additional compensation for high wage and older workers. In the case of mass layoffs, some severance pay – although much less generous – is also due. There are no mandated severance payments for individual layoffs.

In contrast to this, the Danish industrial relations system is characterised by a small amount of interference from the state. This includes employment protection legislation but this is very limited. There are two major provisions, which are both about advance notice. The first provision is limited to white collar workers who have to be given an advance notice. The length depends on the tenure of the worker with a maximum of six months. This set of rules were enacted in 1938. The second provision are the different rules about mass layoffs enacted by the European Union. The Danish legislation in this respect has followed the minimum required by the EU, which has undergone some changes since Denmark joined the EU in 1973. The restrictions on the behaviour of the employers are moderate: they have to submit a notice to the regional labour market board and they have to go into negotiations with their employees before the layoff can be enacted. Other than this, general rules about employment protection are absent from the Danish labour market. This includes the complete absence of severance pay, unless it has been agreed upon in a voluntary contract between the employer and the single employee. Such agreements are relatively uncommon. Just as in Belgium, procedures for dismissal are also absent; that is, employers are not required to act “fairly” or in a “socially responsibly” way. It should be noted, however, that there are some provisions for specific groups in the labour market; this includes, for example, pregnant workers and workers on maternal leave and persons who are elected by their fellow workers as representatives for negotiations with the employer. However, these provisions do not apply in the case of mass layoffs.

2.2 Wage setting.

Belgian wages are generally thought to be rigid. This rigidity can probably be linked to the pyramidal bargaining taking place. Contracts can be bargained at the national, industry and firm level. Agreements struck at a higher level immediately become lower bounds for bargaining at lower levels. These of course limit the downward real wage flexibility at firm level, especially given the fact that as a general rule, Belgian wages are automatically indexed. The main feature of the structure of Belgian pattern of wage bargaining pertinent to our study is the portability of seniority. Indeed, workers changing jobs between firms within the same bargaining unit (often an industry) keep their accrued seniority. This considerably limits their

ability to accept wage cuts, even if a worker is willing to do so.

The Danish labour market is heavily unionized with 80-90 percent of Danish workers being members of trade unions. For the time period considered below, centralised negotiations in the private sector took place every second year between the Confederation of Unions, which represents both skilled and unskilled workers, and the Confederation of Employers. There were different levels of bargaining at lower levels, including bargaining between single employers and shop-stewards. Interference by the state in the bargaining process is limited to the centralized level in instances where agreement has not been reached. The state does not extend contracts between employers and unions to employers who are not covered by collective agreements. There are no formal minimum wage laws in Denmark. This implies that despite the fact that the Danish system at face value looks very unionized and centralized, there are loopholes with respect to the acceptance of wage reductions. It is not known how large is the share of workers who are covered by collective agreements but recent figures of as low as about fifty percent have been suggested although a more likely figure is about 75%.

2.3 Unemployment Insurance provisions.

The Belgian system of Unemployment Insurance (UI) is said to be one of the most generous in the world (Burda, (1988)). As a general rule, benefits do not expire in Belgium. However, they are reduced after one and two years of unemployment. In fact, a closer look at the Belgian UI system indicates that it hardly qualifies as an insurance system. First, students can qualify for benefits even if they have never been employed. Second, and more importantly, benefits are means tested. The official replacement rate is 60% of the lost wage during the first year of unemployment and 40% after that. Practically, these rates are meaningless. Many UI recipients receive a compensation which is entirely based on family status and income. Thus 'heads' of households receive a flat amount which can be higher than 60% of their lost wages, whilst the benefits of most other workers are limited by a cap on benefits and are often below 60% of their lost wages.

The Danish UI system is closer to a true insurance scheme in that it does not have a mean test for benefits but it also has many features (such as the absence of differentiation with respect to risk) that reduce the insurance element. It is considered 'generous' compared to most other countries, both with respect to the level and duration of benefits. The maximum amount in unemployment benefit is 90 percent of the previous wage, but this is only obtained by workers with low previous wage levels. At the beginning of the 1980's, the benefit level was capped at about the average wage level for workers in the private sector. Since that time this maximum has been eroded considerably so that now the average replacement ratio is about 65 percent. Thus Danish workers with high wage levels have a replacement ratio that is somewhat lower than in many other countries. Formally, there is a maximum duration period, but until the beginning of the 1990's unemployed workers could become eligible for continued benefit by participating in a public employment scheme. This implied that the duration period were practically unlimited. Unemployment benefit is limited to persons who are members of an unemployment insurance fund, which is typically run by a union. About 80 percent of Danish private sector workers are members of an unemployment insurance fund. In order to become a member, workers have to fulfil a requirement of work experience. In the 1980's, six months of work within one year was required. However, persons who graduate from schools

aiming at a particular trade or as skilled workers in the apprenticeship system also have a right to become members of an unemployment insurance fund.

3. Data.

3.1 The data sets.

For Belgium, we use administrative data from the Belgian social security system. All Belgian workers, with the exception of tenured employees of the federal government, are included in that database. The data provide one record per employee per employer per year, plus information about potential spells of unemployment. In these records, we directly observe the age and sex of the worker, the wage, the number of days worked and a broad occupational classification (blue collar/white collar). From these records, it is possible to reconstruct employee and firm histories and a (censored) measure of tenure. We do not however directly observe the reasons for separation from a job. Nor do we observe any family characteristics, so that we cannot re-construct UI benefit entitlements. In our computations for both countries, public sector jobs will be excluded (although workers who are displaced from a private firm and find a job in the public sector will be included).

The Danish data is based on the fact that all Danish residents have a personal number. A very wide variety of transactions are recorded against these personal numbers. These data are then centralised and collated by Danmarks Statistics and are available for research purposes (subject to very stringent controls to maintain confidentiality). Thus, in principle, it is possible to track all adult Danish residents from 1980 to 1994 (the latest year for which information is available) and to analyse a wide variety of behaviour. Moreover, individuals can be linked to each other to form households and they can also be linked to the plants at which they work which themselves can be followed over time. Thus there is considerable scope for research into the labour market allowing for demographic and plant information. In this study we take a sub-sample of workers in private firms and follow them from 1980 to 1991. Unfortunately, although the initial sample size is reasonably large (37,319 workers) we are left with only a few workers in specific strata which somewhat limits the precision of some of the analysis below. For example, the restriction to high tenure workers leaves 15,860 workers and then the number of these displaced in the reference year is only 547!

The major difference between the two data sets is the fact that the Belgian data are firm based, whilst the Danish is plant based. A second (minor) difference is that all 'point in time' wage and employment variables for Belgium are defined for the end of the year whereas they are defined for mid November for Denmark.

3.2 Firm/plant identification and false 'deaths'.

In Belgium, firms are identified by a unique taxpayer number that can survive change in ownership. A firm ID number will change only if the firm disappears as a corporation (the ID will not change if the corporation is taken over) and all its debts have been paid in full. Given the nature of Belgian industrial organisation (big holding companies holding shares in

many corporations), corporations rarely disappear. Although they are probably more rare than in the U.S., mergers happen. Some firms also die and revive under a different name. To control for that possibility we proceeded as follows: dying firms where at least 70% of the workers were rehired (in order not to meet our criteria for being called a displacing firm) and 70% of those rehired were rehired in a single firm were not considered to be displacing firms.

In Denmark, an establishment is considered a continuing establishment if any one of the following four criteria is satisfied from one year to the next: there is the same owner and same industry; there is the same owner and largely the same employees; there is the same employees and the same industry or there is the same employees and the same address. More precisely, “same industry” means the same ISIC-code at the 5 digit level, and “same employees” in the second case, means that either at least 30% of the first employees remain at the plant or make up at least 30% of the second-year employees, while “same employees”, in the third and fourth cases, means that at least 30% of the first employees remain at the plant *and* make up at least 30% of the second-year employees. Note that these classifications depend on the whole labour force and not on the specific sample that we use below.

With such a classification, it is possible to categorise a worker as ‘displaced’ even though we would not consider the workers as being genuinely displaced. This can happen if a share of the workers at a plant is taken over by another plant. Our database contains variables to take this situation into account. For continuing plants, these plants are considered “non-identical” if at least 2 workers find employment in another plant - we refer to such firms as “spin offs”. For plants that close these plants are considered “taken over” by another plant, if the number of the workers employed in the other plant are at least 2 *and* these workers constitute at least 30 percent of the workforce in the closed plant; we term these “take overs”. For the present purposes, the following rules apply: the “spin offs” will be considered displaced workers (note that movements within a firm are given first priority, i.e. “spin offs” within a firm are not considered displaced) but “take overs” will not be considered displaced workers (they are placed in the category “other workers”).

3.3 Defining displacement.

We will label as ‘displaced’ all the workers who separate from a firm (or plant) where employment has been reduced by 30% or more during the reference year and which had more than 5 employees before the layoffs started. In the sample used below multiple job holders are always excluded and workers having less than three years tenure at the time of displacement are usually excluded. We have also constructed two comparison groups. The first one is made of workers with at least three years of tenure continuing in employment in firms (plants, for Denmark) which displaced workers (that is, they were still employed at that firm at the end of the displacing year). The second comparison group is made up of workers with at least three years tenure employed at other plants or firms. The exception to the three years tenure rule is when we compute displacement rates. Thus the analysis of the after displacement outcomes and transitions given below includes only workers with three years or more of tenure and excluding multiple job holders. This study of outcomes will look at displaced workers’ histories up to three years after their job loss.

4. Results.

4.1 Who is displaced?

To put our results in context, we first present some aggregate statistics for Belgium and Denmark for the years before and after our sample period. The first panel in Table 2 presents the sample years. The other panels present some statistics on aggregate unemployment, growth, inflation and real wages. In the period before the sample period, Belgium was suffering a recession and unemployment grew quite quickly (from 7.8% to 11.7%). In contrast, the pre-sample years in Denmark were relatively healthy, although the economy declined in the sample year. The post-sample experiences are much more similar, except that average manufacturing wages declined in Belgium but not in Denmark. In both countries unemployment increased a little in the post-sample period even though there was modest real growth. We take these statistics to indicate that the post-sample macro environment in the two countries were similar and are unlikely to account for any large differences in outcomes that we observe below.

In Table 3 we present the incidence of displacement in Belgium and Denmark (for all workers). Although there are some significant differences, the most striking feature of this Table is that long tenure workers (those with three or more years with the firm/plant) are just as likely to be displaced in Denmark as in Belgium (3,45% and 3,41% respectively). This comes as something of a surprise since, as we have seen, Belgium has very stringent lay-off rules and Denmark has very weak ones. The major difference between the two countries is that short tenure workers in Denmark are more likely to be displaced and Danish workers (short tenure and long tenure) are much more likely to be displaced from a shrinking firm than from a dying one. There are two possible explanations for this latter. It may reflect the fact that in Belgium it is more difficult for firms that continue in business to lay off workers or it may be that Danish plants are less likely to go out of business, perhaps because they are larger. With the data to hand we are unable to distinguish between these alternatives.

In Table 4 we present some of the characteristics of displaced workers. Since our primary focus is on long tenure workers we present results only for workers who had at least three years of tenure at the plant/firm where they worked in the sample period. We also break down the sample by whether the firm closed down or not. Finally, we present the same statistics for workers who continued in ‘shrinking’ firms and for workers who were not in firms that displaced workers. Comparing the latter to the displaced sample, we see that displaced workers in Belgium tend to have slightly lower tenure (but remember that all the workers here have at least three years tenure); to have lower wages; to be more likely to be blue collar and to work for smaller firms than ‘other workers’. It is also clear that women are more likely to be displaced. There are similar differentials for firm size, tenure and being blue collar in Denmark but the differences in wages and gender composition are much smaller in Denmark.

Finally we present an analysis of the characteristics of the displaced using a simple Probit for being displaced (see Table 5); note that here we include all workers, not just the long term. The first column provides a comparison with ‘all non-displaced workers’ and the second is a comparison with those who remain in displacing firms. In Belgium the categories more likely to be displaced are: male, blue collar, lower wage and low tenure. There is no

significant effect of age for those aged between 20 and 60 but workers aged over 60 are more likely to be displaced. The results for the comparison with those in displacing firms are somewhat different. In particular, the tenure effects are now stronger (with workers with less than one year of tenure being much more likely to be displaced than other workers). Despite the differences in sign, the age effects are similar (note that the comparisons are with 'under 20' group so that the change in sign only tells us something about this group). In Denmark, the probabilities of being displaced are quite similar to those for the 'other' comparisons in Belgium. Thus the first columns of Tables 4 and 5 give a similar picture in comparisons of who is displaced in the two countries. For the comparison with 'non-displaced' workers, however, the Danish results do not show any significant differences in the tenure effects. All in all, there are only relatively minor differences between the personal characteristics of workers who are displaced in Belgium and Denmark. The main differences seen in Table 4 - in the proportion who are white collar workers and the firm size - reflect differences found in the 'other worker' sample. As we shall see below, there are quite sharp differences in the post-displacement experiences for workers in the two countries; the results presented in Tables 4 and 5 suggest that these differences in outcomes are unlikely to be due to the sample composition of the displaced groups.

4.2 Post displacement employment outcomes.

In Table 6 we present some statistics on the unemployment outcomes after displacement (once again, only for long tenure workers). Specifically, this gives details of how many months of unemployment displaced workers experience in the three years after the displacement. It is most important to note that these statistics give information on (registered) unemployment after displacement and *not* non-employment. Thus someone who withdraws from the labour force after displacement or remains in the labour force but does not register as unemployed would not be included in the 'unemployed' here. These results reveal some extraordinary differences between Belgium and Denmark and between these countries and other countries. First, almost two thirds of Danish workers experience no interruption in employment (or unemployment in the subsequent three years) as against one third for Belgium. The latter figure is more in line with the international experience so one immediate worry is that the Danish figure is incorrect. One possibility is that in the Danish sample we are misclassifying workers and our displaced sample actually includes some workers who are found employment in other plants within the same firm. Although we cannot completely rule this out, as we have documented in the data section above we have gone to great lengths to ensure that we are not making such an error. We also note that the proportion of all workers in Denmark who experience some unemployment in our reference year is 23%. This is in line with aggregate statistics that are compiled from different sources which leads us to believe that our calculations are not seriously biased.

Turning to workers who do experience some unemployment we see that Danish workers are unemployed for an average of five months but Belgian workers have average spells of 15 months (but note that any spell is truncated above at 36 months). Now it is the Belgian results that are out of line with the wider international experience. To investigate these differences, we also present a more detailed inspection of the distribution of spell lengths. From these we see that Danish workers either move out of unemployment relatively quickly

(more than 50% of those exiting unemployment do so within about two months) or tend to stay for long spells. By contrast, the majority of workers who become unemployed in Belgium tend to have long spells - less than one half of them have left unemployment after one year.

Combining the probability of having any unemployment and the mean spell length, we see that a Belgian displaced worker has an expected unemployment spell length of about ten months as against six weeks for a Danish worker. What could account for such large differences? Here we informally list some possibilities. The first possibility is that there is a difference in definitions. The definitions of unemployment in our two samples are not exactly the same but they are so close that it is not credible that the differences in outcomes are attributable to this. A second possibility is that there are differences in sample composition, that is, that the composition of the displaced worker groups are very different in the two countries. As we saw in Table 4, however, the two samples appear to have similar personal characteristics so that it is unlikely that it is this that accounts for the differences in unemployment outcomes. A third possibility is that the differences are due to differences in notice provisions. As discussed in the institutions section, generally workers in Belgium receive *more* advance notice of closures and mass lay-offs than workers in Denmark. Conventional search models would then suggest the converse of what we observe. Similar remarks apply to a fourth possibility, namely that the differences in outcomes can be attributed to differences in Unemployment Insurance systems. Both Denmark and Belgium are usually regarded as having very 'generous' UI systems (see, for example, Table 1 above) but, as discussed in the institutions section, this is something of an illusion for Belgium. In fact, an unemployed worker in Denmark is more likely to receive high benefits than a comparable worker in Belgium. This is because Belgian benefits are means tested so that married workers with an employed spouse do not receive much. Given this, we regard it as extremely unlikely that the differences in unemployment outcomes in Belgium and Denmark are due to differences in the UI system. Indeed, we can go further and question whether the 'generosity' of the UI system in Belgium 'causes' the observed long unemployment spells, given that the UI system in Denmark is at least as 'generous' and unemployment spells are much shorter. This is clearly work for the future but we note here that this conclusion - that the long spells in Belgium are unlikely to be solely the result of the UI system - highlights the virtue of making cross-country comparisons.

A fifth possibility is that the payment of severance pay to long tenure workers in Belgium facilitates longer unemployment spells there. Certain aspects of the results presented here are consistent with this. For example, the longer duration for the longest tenure workers, (see the discussion of Table 8). Moreover, this effect is absent for Denmark where severance pay is not usually paid. This is certainly an explanation that deserves closer inspection but the data to hand do not report severance pay so that we cannot follow this through here. A sixth possible explanation for the differences between the two countries is the different cyclical effects in the two countries. As discussed above, however, Belgium and Denmark experienced fairly similar cyclical conditions after the reference year; it is difficult to believe that such small differences could lead to such large differences in outcomes. Yet another alternative (number seven) is that because the UI system in Denmark is administered by the unions they have more incentive or more ability to find displaced workers new jobs. We discuss the administration of the system in detail in Appendix A but here it is sufficient to note that although the unions administer UI payments they have no direct incentive to move workers

from unemployment to a new job, so that we consider unlikely that this explains the differences.

An eighth alternative is that labour demand conditions differ significantly across the two countries. Although the cyclical conditions in the countries are similar, it is still possible that there could be permanently lower arrival rates of job offers in Belgium. In a conventional search model this would lead to longer unemployment durations. This would also be consistent with the major difference in employers' firing flexibility between the two countries. Thus, high firing costs in Belgium lead to employers being less willing to hire and to consequently longer durations. If this explanation is to be consistent with the roughly equal unemployment rates in the two countries (see table 2) then it means that flows into unemployment must be much higher in Denmark. Given that displacement rates in Denmark are not dramatically higher than in Belgium (see Table 3) this means that the bulk of Danish unemployment has to be the result of something other than displacement. We cannot check this with the data to hand but this is clearly a promising avenue of future research. Finally, it could be that the differences arise because Danish wages are less rigid downwards. The aggregate figures on wage growth given in Table 2 suggests that, if anything, the converse is the case. These show that the average wage in Belgium declined in the year after the sample year but Danish wages did not. On the other hand, these aggregate changes may be masking changes for displaced workers in Denmark who take a job. Thus we need to look at what happened to the earnings and wages of re-employed displaced workers. We shall do this shortly. For now we anticipate later results and state that we do not believe that the very large differences in unemployment outcomes are attributable to an increased propensity for unemployed Danish workers to accept lower wages.

To complement the unemployment statistics of the previous Table, in Table 7 we present re-employment rates at annual points in time after the displacement. These largely confirm the analysis above - Belgian displaced workers have much lower subsequent re-employment rates than Danish displaced workers, particularly in the year after the displacement. One additional interesting feature in Table 7 is that we see that Belgian workers who were in a shrinking firm in the reference year but were not displaced, are significantly less likely to be employed in later years than 'other' workers. This is not the case for Denmark - the employment rates for 'other' workers and workers who stayed with shrinking firms are almost identical. Once again, the likeliest explanation for the difference is the differences in firing costs: Danish firms adjust more quickly to negative demand shocks and are less likely to experience persistent downsizing.

We end the analysis of re-employment with a duration analysis of re-employment; see Table 8. This gives the (assumed proportional) impacts of different characteristics on the probability of being re-employed. In both countries re-employment is more likely for men, for younger workers and for higher wage workers. The only significant difference between the two countries is that in Belgium white collar workers have higher re-employment probabilities whereas in Denmark the converse is true.

4.3 Post displacement wages and earnings.

We turn now to earnings and wages for those who find a job. In Table 9 we present statistics on earnings in the years after displacement; once again these are for long tenure

workers. The preparation of these figures makes them somewhat different from those presented for the U.S. by Jacobson, LaLonde and Sullivan (1993). In the latter study the possibility of out of state migration (with consequent attrition from the sample) meant that Jacobson *et al* had to condition on having some positive earnings in all of the comparison years after the displacement. In our analysis we only condition on being in employment at the end of the relevant year (strictly, in November for Denmark, see Appendix B for more details). The top panels of Table 9 present average earnings in the year, conditional on our employment condition, so these are comparable to those given by Jacobson *et al* (1993). These averages are not across the same people in each year so that employment change, wage changes and selection are all confounded. In the lower panel of Table 9 we present mean log differences in annual earnings as compared to the displacement year so that the comparison in any year is with the same workers in the reference year (year 0). The most obvious feature of the lower panels in Table 9 is the very large falls for displaced workers in Belgium in the year after displacement. This reflects the fact that Belgian displaced workers are more likely than Danish displaced workers to have only part year employment in the year after, even if they are back in work one year later. There is also a strong decline in year two for Belgian ‘non-displaced workers at shrinking firms’. This mirrors the persistence in displacement seen in Table 7. Comparing the results for the two countries, we see that for Denmark even ‘other workers’ record a small loss in earnings (of 1.5%) over the three years whilst displaced workers have a larger loss of 8.3%. Thus Danish displaced workers seem to have a medium run earnings loss of about 6.8% as compared to other workers. In Belgium, however, three year earnings losses are actually smaller for displaced workers than for ‘other workers’. Indeed, Belgian workers who were not displaced experienced an earnings loss of 7.6% in the year after the reference year. This is consistent with the macro evidence on wage (see also the next Table) and employment changes in year one given in Table 2.

In Table 10, we present average wage levels and log wage changes. Once again, we concentrate on the latter. For wages the perverse effect noted for earnings for Belgium disappears. Now both Danish and Belgian workers show a decline relative to ‘other’ workers. The order of the decline for Denmark is similar to that of earnings (a relative loss of 6.4% as against a relative loss of 6.8% for earnings). This suggests that all of the relative medium run negative impacts on earnings for Danish workers are driven by wage losses and not employment changes. In contrast, Belgian displaced workers suffered a relative wage loss of 3.7% as against a relative earnings gain of 6%. It is important in interpreting these results to keep in mind that we are always conditioning on being back in work at the end of the relevant year. For the reasons discussed above, this probably does not matter much for Denmark but in Belgium those who have found a job after a year are the exception rather than the rule. That displaced Belgian workers who are re-employed are doing relatively better than those who were not displaced can only be a selection effect.

We finish our analysis with a regression analysis of the wage loss for those who are re-employed two years after the displacement. For both countries the coefficient on lagged wage is significantly less than unity so that higher wage workers lose relatively more. Moreover, this effect is more pronounced for Denmark suggesting that higher wage workers in Denmark do a good deal worse; this is consistent with the earlier analysis suggesting that Danish workers go back to work much more quickly and suffer some wage loss as a consequence. There is no significant effect of age for workers aged between 20 and 60 but

workers aged over sixty who choose to go back to work suffer very large falls: 14% for Belgium and 28% for Denmark. Both countries also show much larger wage losses for women (15% for women relative to men for Belgium and 17% for Denmark). Given that the re-employment probabilities seem to be lower for women than for men (see Table 8) this is clearly an important area for future research. One other notable feature is that post-displacement wage losses do not seem to be correlated with tenure (given the selection on having at least three years of tenure).

5. Conclusions.

We have compared the displacement experience in two countries - Belgium and Denmark - that share some common features in their labour market institutions but that also display significant differences. In particular, both have what are thought to be 'generous' UI systems but firing costs in Belgium are high relative to other countries whereas firing costs in Denmark are very low by international standards. We found that displaced workers in Denmark are more likely to be displaced from a firm that continues in existence than are displaced Belgian workers. This is consistent with the fact that firing costs are much higher for Belgian firms and consequently they are less likely to shed workers if they stay in business. Apart from this we did not find significant differences in the before-displacement characteristics of displaced workers in the two countries. When we compare post-displacement outcomes there are very significant differences in employment outcomes but only relatively minor ones in wage losses for those who are re-employed. Belgian workers have an expected unemployment spell of ten months whilst Danish workers have an expected spell length of only six weeks. We reviewed a number of possible explanations for this difference. In particular, we reject the proposition that the longer Belgian spells are due to the UI system since the Danish UI system is even more likely to induce long unemployment spells. We concluded that of all of the explanations we examine, only one is likely to be the cause of the longer spells, namely that there are permanent differences in the demand side and Belgian workers face a much lower arrival rate of job offers. This lower propensity to hire by Belgian firms is consistent with the differences in firing costs.

Table 1: Labour market characteristics (Ranking out of 53 countries)			
	Flexible hiring and firing	Low legislative restrictions on firing	Unemployment Insurance 'meanness'
Belgium	39	46	52
Canada	10	11	24
Denmark	1	10	46
U.K.	8	5	10
U.S.A.	7	8	5

Table 2: Macroeconomic Environment (Growth rates, except for unemployment rates)						
Time to Displacement Year		-2	-1	0	1	2
	Belgium	1981	1982	1983	1984	1985
	Denmark	1986	1987	1988	1989	1990
Real Growth						
	Belgium	-1.4	1.5	-0.1	1.3	2.1
	Denmark	3.6	0.3	1.2	1.6	1.4
Employment						
	Belgium	-0.1	-2.0	-1.3	-1.1	0
	Denmark	2.6	0.5	-0.6	-0.5	0
Unemployment Rate						
	Belgium	7.8	10.0	11.7	12.9	12.9
	Denmark	10.0	9.6	10.3	11.1	11.3
Inflation						
	Belgium	7.6	8.7	7.7	6.3	5.2
	Denmark	3.3	4.0	4.5	4.6	2.6
Real Manufacturing Wages						
	Belgium	1.4	-1.4	-1.7	-2.1	1.4
	Denmark	1.5	0.4	2.0	0.3	1.8

Table 3: Incidence of displacement (percent of all workers in the private sector)			
	All Displacements	Of which: Firms Shrinking	Firms Dying
Belgium			
All displaced workers	4,78	2,67	2,11
Workers with tenure of three or more years	3,41	1,80	1,61
Denmark			
All displaced workers	6.61	4.96	1.65
Workers with tenure of three or more years	3.45	2.84	0.61

Table 4: Characteristics of the Displaced Workers.
(Population of workers with 3 years or more tenure)

All Displaced Workers

	Belgium		Denmark	
	Mean	St. Error	Mean	St. Error
Proportion Men	.68	.002	.68	.020
Proportion White Collars	.36	.002	.48	.021
Age	38.66	.056	41.1	.490
Tenure (Years)	5.09	.006	5.77	.088
Proportion with more than 6 Years Tenure	.56	.002	.56	.496
Proportion Displaced Because of Closure	0.48	.002	0.18	.016
Average Daily Wage Lost Job (BF/DK _r)	1,942	6.77	128.8	2.70
Average Size of Firm	23.37	0.82	45.7	5.39
Number of Observations:	42,255		547	

Displaced Workers in Dying Firms

	Belgium		Denmark	
	Mean	St. Error	Mean	St. Error
Proportion Men	.656	.003	.667	.049
Proportion White Collars	.332	.003	.563	.051
Age	37.95	.080	40.4	1.18
Tenure (Years)	5.104	.008	5.57	.212
Proportion with more than 6 Years Tenure	.567	.003	.479	.051
Proportion Displaced Because of Closure	1.000		-	-
Average Daily Wage Lost Job (BF)	1,865	8.87	125.3	6.14
Average Size of Firm	20.330	1.242	27.3	4.40
Number of Observations:	20,294		96	

Displaced Workers in Shrinking Firms

	Belgium		Denmark	
	Mean	St. Error	Mean	St. Error
Proportion Men	.707	.003	.683	.022
Proportion White Collars	.393	.003	.457	.023
Age	39.32	.079	41.2	.540
Tenure (Years)	5.082	.008	5.81	.097
Proportion with more than 6 Years Tenure	.555	.003	.528	.023
Proportion Displaced Because of Closure	0		-	-
Average Daily Wage Lost Job (BF)	2,014	10.10	129.6	3.01
Average Size of Firm	24.824	1.057	50.8	6.77
Number of Observations:	21,961		451	

Table 4: (continued)

Non-Displaced Workers in Displacing Firms

	Belgium		Denmark	
	Mean	St. Error	Mean	St. Error
Proportion Men	.704	.002	.660	.019
Proportion White Collars	.369	.002	.544	.020
Age	39.746	.057	40.7	.440
Tenure (Years)	5.772	.008	5.68	.084
Proportion with more than 6 Years Tenure	.542	.003	.497	.020
Proportion Displaced Because of Closure	-		-	-
Average Daily Wage Lost Job (BF)	2,053	8.54	127.4	2.03
Average Size of Firm	24.824	1.057	69.5	11.03
Number of Observations:	39,231		608	

Other Workers

	Belgium		Denmark	
	Mean	St. Error	Mean	St. Error
Proportion Men	.732	.000	.668	.004
Proportion White Collars	.454	.000	.542	.004
Age	39.288	.010	41.0	.087
Tenure (Years)	5.386	.001	6.14	.017
Proportion with more than 6 Years Tenure	.703	.000	.608	.004
Proportion Displaced Because of Closure	NA		-	-
Average Daily Wage Lost Job (BF)	2,294	1.35	131.2	.499
Average Size of Firm	49.120	1.548	66.7	2.03
Number of Observations:	1,104,004		14,705	

Table 5: The probability of being displaced.

Belgium: Probit analysis of being displaced during 1983 (dependent variable = 1 if displaced)

	Compared with all non-displaced workers	Compared with non-displaced workers in displacing plants/firms
Male	.043 (.004)	-0.008 (0.009)
White collar	-0.122 (0.003)	-0.014 (0.008)
log(wage)	-0.291 (0.004)	-0.066 (0.009)
Aged 20-29	0.153 (0.008)	-0.133 (0.024)
Aged 20-39	0.161 (0.008)	-0.270 (0.024)
Aged 40-49	0.161 (0.008)	-0.304 (0.025)
Aged 50-59	0.172 (0.009)	-0.304 (0.025)
Aged 60 or over	0.250 (0.013)	-0.245 (0.032)
Tenure of one year	0.128 (0.005)	-5.95 (0.062)
Tenure of two years	0.017 (0.007)	-6.16 (0.063)
Tenure of three years	-0.051 (0.007)	-6.13 (0.063)
Tenure of four years	-0.020 (0.007)	-6.02 (0.064)
Tenure of five years	-0.033 (0.008)	-6.09 (0.064)
Tenure of six or more years	-0.209 (0.005)	-6.16 (0.063)
Pseudo R-squared	0.026	0.106
Sample size	1,861,806	142,275

Note: Omitted age is 'less than 20; omitted tenure is 'less than one year'.

Table 5 (continued).

Denmark: Probit analysis of being displaced during 1988 (dependent variable = 1 if displaced)

	Compared with all non-displaced workers	Compared with non-displaced workers in displacing plants/firms
Male	0.025 (0.023)	0.171 (0.048)
White collar	-0.176 (0.022)	-0.213 (0.047)
log(wage)	-0.117 (0.025)	-0.206 (0.054)
Aged 20-29	-0.112 (0.037)	-0.104 (0.080)
Aged 20-39	-0.137 (0.041)	-0.188 (0.088)
Aged 40-49	-0.119 (0.042)	-0.236 (0.090)
Aged 50-59	-0.135 (0.048)	-0.344 (0.098)
Aged over 60	0.044 (0.093)	-0.160 (0.185)
Tenure of one year	-0.234 (0.029)	-0.279 (0.061)
Tenure of two years	-0.333 (0.036)	-0.414 (0.074)
Tenure of three years	-0.473 (0.046)	-0.539 (0.092)
Tenure of four years	-0.445 (0.051)	-0.463 (0.102)
Tenure of five years	-0.470 (0.063)	-0.407 (0.126)
Tenure of six or more years	-0.594 (0.033)	-0.340 (0.069)
Pseudo R-squared	0.045	0.044
Sample size	37,319	3,494

Table 6: Unemployment for long tenure displaced workers		
	Belgium	Denmark
Proportion of displaced workers with some unemployment in the three years after displacement	0.65 (.002)	0.31 (.020)
For workers with some unemployment:		
Mean number of months in three years after displacement (Maximum is set to 36 months)	15.22 (.068)	5.31 (.585)
Percentiles:		
5	0.69	0.15
10	1.38	0.24
25	4.16	0.89
50	13.86	2.09
75	25.40	5.33
90	32.10	16.73
95	33.49	25.48
Note: this does not include non-employment spells that are not registered as unemployment.		

Table 7: Re-employment (share of workers employed)				
Years after displacement:	0	1	2	3
Belgium.				
Displaced workers	1.000	0.370 (0.002)	0.583 (0.002)	0.664 (0.002)
Non displaced workers at displacing firms	1.000	1.000	0.712 (0.002)	0.785 (0.002)
Other workers	1.000	0.930 (0.000)	0.871 (0.000)	0.892 (0.000)
Denmark				
Displaced workers	1.000	0.718 (0.019)	0.750 (0.019)	0.746 (0.019)
Non displaced workers at displacing firms	1.000	1.000	0.911 (0.012)	0.859 (0.014)
Other workers	1.000	0.957 (0.002)	0.918 (0.002)	0.879 (0.003)
Proportion of workers employed at the end of the year (Belgium) or in November of the year (Denmark).				

Table 8: Duration analysis of re-employment for long tenure workers		
	Belgium	Denmark
Male	0.095 (0.014)	0.117 (0.202)
White collar	0.142 (0.013)	-0.325 (0.193)
Log (wage)	0.192 (0.015)	0.221 (0.412)
Aged 20 to 29	-0.090 (0.057)	-0.315 (1.08)
Aged 30 to 39	-0.200 (0.057)	-0.234 (1.09)
Aged 40 to 49	-0.417 (0.058)	-0.366 (1.10)
Aged 50 to 59	-0.941 (0.059)	-0.577 (1.10)
Aged 60 or over	-1.686 (0.075)	-0.709 (1.22)
Tenure of four years	-0.019 (0.020)	-0.282 (0.298)
Tenure of five years	0.106 (0.021)	0.615 (0.364)
Tenure of six or more years	0.137 (0.017)	0.163 (0.230)
Sample size	42,223	135
Notes. Cox non-parametric estimation of re-employment hazard, compared to all non-displaced workers. Only workers with three or more years of tenure. Omitted age is 'less than 20'; omitted tenure is 'three years'.		

Table 9: Average annual Earnings				
<i>Panel A: Average Earnings Level of Workers</i>				
Years after displacement:	-1	0	1	2
Belgium (1981 BF)				
Displaced Workers	397,783 (1,114)	327,101 (1,354)	366,496 (1,516)	370,934 (1,548)
Non displaced workers at displacing firms	402,002 (1,157)	394,304 (1,390)	323,612 (1,435)	350,049 (1,575)
Other Workers	498,963 (245)	489,596 (313)	491,471 (321)	484,745 (330)
Denmark (1988 D.Kr)				
Displaced Workers	185,375 (5,003)	169,031 (4,687)	174,887 (5,017)	170,386 (5,199)
Non displaced workers at displacing firms	194,045 (4,350)	189,703 (4,388)	181,627 (4,333)	179,697 (4,118)
Other Workers	201,811 (840)	197,817 (865)	197,601 (899)	196,941 (931)
Sample selection - Denmark: Wage rate positive in November of the relevant year. Belgium: Wage rate positive at end of relevant year				

<i>Panel B: Earnings Growth of Workers (log(Earnings_t) - log(Earnings₀))</i>			
Years after displacement:	1	2	3
Belgium			
Displaced Workers	-.393 (.004)	-.094 (.004)	-.026 (.004)
Non displaced workers at displacing firms	-.044 (.002)	-.387 (.004)	-.091 (.004)
Other Workers	-.076 (.000)	-.064 (.000)	-.086 (.000)
Denmark			
Displaced Workers	-.060 (.018)	-.049 (.025)	-.083 (.030)
Non displaced workers at displacing firms	-.031 (.010)	-.044 (.012)	-.062 (.015)
Other Workers	-.013 (.002)	-.015 (.003)	-.015 (.003)

Table 10: Average wages

<i>Panel A: Average Wage Level of Workers</i>				
Years after displacement:	-1	0	1	2
Belgium (1981 BF)				
Displaced Workers	1,870 (6.52)	1,776 (7.75)	2,012 (5.36)	2,077 (5.49)
Non displaced workers at displacing firms	1,824 (7.61)	1,882 (4.414)	1,773 (5.83)	1,716 (6.60)
Other Workers	2,124 (0.92)	2,122 (1.24)	2,102 (1.16)	2,082 (1.63)
Denmark (1988 D.Kr)				
Displaced Workers	129 (2.70)	134 (3.97)	133 (3.82)	134 (3.46)
Non displaced workers at displacing firms	127 (2.03)	129 (2.94)	132 (2.23)	133 (2.31)
Other Workers	131 (0.50)	133 (0.61)	139 (0.61)	142 (0.57)
Notes: Daily wage rates in 1981 Belgian Francs. Hourly wages rates in 1988 Danish kroner Sample selection - Denmark: Wage rate positive in November of the relevant year. Belgium: Wage rate positive at end of relevant year.				

<i>Panel B: Wage Growth of Workers (log(Wage_t) - log(Wage₀))</i>			
Years after displacement:	1	2	3
Belgium			
Displaced Workers	-.038 (.002)	-.065 (.002)	-.088 (.002)
Non displaced workers at displacing firms	.008 (.002)	-.038 (.002)	-.076 (.002)
Other Workers	-.018 (.000)	-.032 (.000)	-.051 (.000)
Denmark			
Displaced Workers	-.032 (.021)	-.015 (.020)	.001 (.021)
Non displaced workers at displacing firms	.004 (.008)	.023 (.010)	.031 (0.11)
Other Workers	.008 (.002)	.049 (.002)	.065 (.002)

Table 11: Regression analysis of wages in subsequent job.		
	Belgium	Denmark
Log wage on lost job	0.587 (0.005)	0.382 (0.054)
20 < Age <= 30	-0.022 (0.016)	0.595 (0.133)
30 < Age <= 40	-0.006 (0.016)	0.611 (0.134)
40 < Age <= 50	-0.020 (0.016)	0.614 (0.135)
50 < Age <= 60	-0.016 (0.016)	0.498 (0.137)
Age > 60	-0.159 (0.022)	0.332 (0.215)
Male	0.148 (0.004)	0.174 (0.043)
White Collar	0.167 (0.004)	0.073 (0.041)
Tenure = 4 years	0.003 (0.006)	-0.062 (0.059)
Tenure = 5 years	-0.010 (0.006)	-0.099 (0.068)
Tenure = 6 years or more	-0.003 (0.005)	-0.051 (0.049)
Lost job firm dead	0.033 (0.003)	0.027 (0.048)
Size of lost job firm	0.001 (0.001)	0.0076 (0.014)
Adjusted R-squared	0.60	0.26
Sample size	27,567	408
OLS for wage in a new job. Belgium: 1985 (two years after a displacement in 1983) Denmark: 1990 (two years after a displacement in 1988) In both cases controls for region and occupation are included.		

Appendix A: Institutions in Belgium and Denmark.

DENMARK

Topics in collective agreements.

In the period under consideration there were biannual centralised negotiations between the Confederation of Danish Trade Unions (the LO) and the Confederation of the Employers Organisation. For wages the negotiations establish a minimum wage level, so that in more decentralised negotiations afterwards (for example at the plant level) lower wage levels than these would not be agreed to. Dependent on the wage settling system, there could be more detailed provisions with respect to the wage level for single groups of workers. Other items in the centralised wage negotiations are provisions about holidays, working hours and overtime. Employment protection provisions played a close to negligible role in the negotiations. With few exceptions, Danish collective agreements do not include employment protection provisions such as advance notice and severance or redundancy pay.

One of the reasons for this absence can be traced back to the formation of the Danish collective bargaining system. As in most other countries employers tried to avoid recognising the right of workers to organise and bargain collectively. After a four months long nation-wide general lockout in 1899 the Confederation of Danish Employers conceded. In return for recognition the trade unions granted the employers the "right to manage" in the "general agreement" between the two organisations which was the main outcome of the conflict. The interpretation of "right to manage" is the (nearly) unlimited formal right of the employers to decide which workers to hire and which workers to fire.

Coverage of collective agreements.

Very firm evidence on the coverage of collective bargains in the Danish private sector is lacking. The last and most authoritative evidence is the result of a survey of firms by Statistics Denmark. In a survey of about 2,000 firms with more than 10 employees 69% indicated that a majority of their employees were covered by collective agreements. When weighted by the number of employees in the firms, these responses suggest that 83 percent of workers in firms with more than 10 employees are employed in firms where the majority of workers are covered by collective agreements. However, the coverage among firms with less than 10 employees is probably considerably below that for larger firms (the coverage among firms with 10-19 employees was 63 percent). Given that about twenty percent of Danish workers work in plants with less than 10 employees and the 63 percent applies to firms with fewer than ten workers then we get an average coverage of 79 percent. This figure is an upper bound. If we assume 50 percent coverage for firms with less than 10 employees then we have an overall coverage of 76 percent. On the basis of these calculations an estimate of 75 percent coverage of collective agreements among private sector employees seems reasonable.

The other major source of evidence is a survey of private sector employees, the results of which are presented in Scheuer (1997). In the survey, only 52 percent of the respondents employed in the private sector answered that they were covered by a collective agreement.

This figure is low as compared to other information. The survey conducted by Statistics Denmark was carried out in order to obtain further information on the matter than the information contained in Scheuer (1997).

Unemployment insurance system.

At the beginning of this century the Danish state began to subsidise the unemployment insurance system run by trade unions, who set up special unemployment insurance funds for this task. Following a reform of the system in about 1970 the unemployment insurance funds do not bear the marginal burden of expenditures for unemployment benefit. Each member pays a fixed amount of fee in order to be a member and the Danish State covers the remaining part of the expenditures. The unemployment insurance funds are in principle separate administrative units, but in practice there is a close connection between the unions and the unemployment insurance funds. However, the unemployment insurance funds are closely regulated by the state with respect to benefit levels, entitlements and so on. One of the duties resting on the unemployment insurance funds is to test that the unemployed members actually search for a job. The general impression is that there is a considerable variation across unemployment insurance funds with respect to the efficiency with which this task is carried out.

Although the administration of UI funds is in the hands of individual trade unions there is also a government labour exchange system that is directly responsible for matching unemployed workers and vacancies. When a firm notifies the labour exchange of a vacancy the latter is required to identify a suitable unemployed worker and send them for interview. If the worker is offered the job and refuses then the labour exchange is required to contact the UI fund and the worker loses benefit for five weeks. This is the formal procedure but the unions also take an active part in finding jobs.

It is extremely difficult to make cross-country comparisons of the "harshness" of the pressure which unemployed are exposed to from authorities, labour unions or social norms in society. Within Scandinavia there is no doubt that the Danish system is more easygoing than the Swedish and the Norwegian systems. This applies both with respect to the formal rules and with respect to the way workers are assigned to jobs. One of the reasons is that trade unions in the other Scandinavian countries are organised as industrial unions, while the Danish ones are organised according to trade or education. Thus the Danish system is somewhat more hesitant with respect to the demand that unemployed should search for jobs that they have not been educated to.

BELGIUM

Job Protection.

Belgian workers have always afforded stable, highly protected jobs, although this is more true for white collars than for blue collars, despite the fact that Belgium recognizes the basic

principle of employment at will¹. Indeed, Belgian law guarantees workers long notice periods and in some cases generous mandatory severance payments. Notices for Blue Collars are relatively short: 4 and 8 weeks for workers with less than 20 years of service and those with more than 20 years, respectively. White collar workers are given much longer period of notice. Low wage² White Collars are given 3 months of notice plus 3 months per completed five years of seniority. For high wage White Collars, these are lower bounds. The actual period of notice has to be set in agreement between the employer and the employee. When no accord can be reached, the length of notice is set by the Labor Courts. Blanpain (1994) estimates that precedents tend to show that the length of notice Courts grant to these high paid employees is a function of age, specialization, tenure and wage. They can go as high as 36 months. Of course, all these restrictions do not apply during trial periods (generally 2 weeks for Blue Collars, but up to six months for White Collars). It is worth noting that during the period considered here, protections were sharply reduced for some categories of white-collar workers. In addition to notice, Belgian workers (Blue and White collars) are given large severance payments in case of plant closing. These payments amount to roughly one month salary per year of seniority, plus some additional compensation for high wage and older workers. In case of mass layoffs, some severance – although much less generous – are due too.

Bargaining and Wages.

Belgian wages are said to be rigid. This rigidity is probably more linked to the pyramidal bargaining taking place than to the legally minimum wages. Contracts can be bargained at the national, industry and firm level. Agreements struck at a higher level are most often extended to all the firms (in Belgium, for national agreements, or in the industry, for industry agreements) and become de-facto lower bounds for bargaining at lower levels. These of course limit the downward real wage flexibility at firm level, especially given the fact that as a general rule, Belgian wages are automatically indexed. The main feature of the structure of Belgian pattern of wage bargaining pertinent to this work, however, is certainly the portability of seniority. Indeed, workers changing jobs between firms within the same bargaining unit (often and industry) keep their accrued seniority. This of course considerably limits their ability to accept wage cuts, even if they are willing to.

Union membership is very high in Belgium. Coverage rates are even higher. All firms with 25 or more employees are de-facto unionized, since they have to have an elected works council, and only union members can be elected to these councils. Non-unionized firms are covered by any relevant contract that has been extended. Inside firms, workers can choose not to be union members. They won't pay dues, but will be covered by all the relevant agreements. They cannot be candidates to the works councils, but they can vote. Finally, unions can coexist and compete for membership inside the firm.

¹Only in a few cases (union representatives, workers on parental leave etc.) does an employer have to provide a 'just cause' for dismissal.

² The threshold between low and high wage is set by decree and is indexed.

Social Safety Net.

The Belgian system of unemployment insurance is said to be one of the most generous in the world (Burda, 1991). This belief has to be somewhat reconsidered. As a general rule, benefits do not expire in Belgium. However, they are reduced after one and two years of unemployment.

In fact, a closer look at the Belgian UI system indicates that it hardly qualifies as an insurance system. First, students can qualify for benefits even if they have never been employed. So can re-entrants. The only penalty in both cases being a waiting period. Second, and more importantly, benefits are means tested. The official replacement rate is 60% of the lost wage during the first year of unemployment and 40% after that. Practically, these rates are meaningless. Many UI recipients receive a compensation that is entirely based on family status and income. Thus 'heads' of households receive a flat amount which can be higher than 60% of their lost wages, whilst the benefits of most of other workers are limited by a cap on benefits and are often below 60% of their lost wages. Third, while there is a search requirement attached UI benefits, this requirement is hardly enforced.

Appendix B: Data selection and definitions.

The aim of our procedures with respect to data selection and definitions of variables is to come as close as possible to similar definitions for Belgium and Denmark, so that the results for the two countries are as comparable as possible. When it is possible or desirable we adopt the definitions in Jacobson, LaLonde and Sullivan (1993), which is the main study on displaced workers using administrative data for the US. This implies that the results in this study are to a certain extent comparable to the results for the US as presented in the study by Jacobson, LaLonde and Sullivan (hereafter JLS). In some instances we could come close to the JLS study for one of our countries, but not for the other one. In such cases we have chosen to select the sample to maximise comparability between Belgium and Denmark.

A. EMPLOYER SIDE

A1. Plants or firms

The Belgium data set contains firms but for the Danish data set the unit is plants. However, the Danish data set contains a variable that indicates if a worker transfers from one plant to another in the same firm. These workers are not considered displaced workers in this study, they are placed in the control groups, i.e. the group of stayers or non-displaced workers in displacing plants. Nevertheless, the difference between firm unit and the plant unit is probably the major problem in this study with respect to comparability between the two countries. The JLS study analyses firms. JLS p. 706 states that the basic statistics are based on "Pennsylvania Unemployment Insurance (UI) tax reports and the state ES202 data on firms"

employment”. The issue is perhaps not quite clear, as there is no explicit discussion about plants or firms as units. JLS, p. 687 mentions “firm” but also mentions “geographical location”. Now, a plant has a geographical location and a single-plant firm does also have a geographical location, while this term is not unambiguous for a multi-plant firm.

A2. Size reduction of plants or firms.

Workers are considered displaced if they separate from a firm (Belgium) or plant (Denmark), which experiences a 30 percent reduction in the work force from one year to the next. This 30 percent rule on plants will produce more displaced workers than the 30 percent rule applied to firms. In general one would expect that it is more serious to separate from a downsizing firm than from a plant, as firms can reallocate the separated workers to another plant in the same firm. However, as just mentioned these reallocated workers are not considered displaced in the Danish data set.

The JLS study also applies a 30 percent downsizing threshold, see JLS, p. 688. However, they do not apply this rule to year to year changes in employment. Instead they apply the following rule, JLS, p. 688: “... separators whose firms’ employment in the year following their departure was 30-percent or more below their maximum level during the late 1970’s”.

A3. Size of plant or firm (cut off point).

In this study we eliminate firms (Belgium) and plants (Denmark) with less than or equal to 5 employees. This cut off point is applied to one particular year. The main reason for the comparatively small cut off point is that a higher cut off point would reduce the sample size of displaced workers for Denmark to a too low level.

The JLS study has a cut off point of 50 employees in one particular year. See JLS p. 688, a footnote “Accordingly we further restricted our sample to those whose firms had at least 50 employees in 1979”.

A4. Identity of establishments (false death problem).

In Belgium firms are identified by a unique taxpayer number that can survive a change in ownership. A firm ID number will change only if the firm disappears as a corporation (the ID will not change if the corporation is taken over) and all its debts have been paid in full. Given the nature of Belgian industrial organisation (big holding companies holding shares in many corporations), corporations rarely disappear. Although they are probably more rare than in the US, mergers happen. Some firms also die and revive under a different name. To control for that possibility we proceeded as follows: dying firms where at least 70% of the workers were rehired (in order not to meet our criteria for being called a displacing firm) and 70% of those rehired were rehired in a single firm were not considered to be displacing firms.

For Denmark, the IDA data base considers an establishment as continuing if just one of the following four criteria is satisfied: 1) same owner and same industry, 2) same owner and same employees, 3) same employees and same industry, or 4) same employees and same address.

More precisely, “same industry” means the same ISIC-code at the 5 digit level, and “same employees” in case 2, means that either at least 30% of the first employees remain at the plant or make up at least 30% of the second-year employees, while “same employees”, in case 3 and 4, means that at least 30% of the first employees remain at the plant *and* make up at least 30% of the second-year employees. Moreover, a reduction in the workforce in a plant could take place although one would not consider the workers as genuinely displaced. (a) This could be the case if a share of the workers at a plant is taken over by another plant. The IDA data base contains variables to take this situation into account. For continuing plants, these plants are considered “non-identical” if at least 2 workers find employment in another plant. The creators of the IDA data base baptized these workers "spin offs". (b) For closed plants these plants are considered “taken over” by another plant, if the number of the workers employed in the other plant are at least 2 *and* these workers constitute at least 30 percent of the workforce in the closed plant. In the terminology of creators of the IDA data base these workers are "take overs". For the present purpose, i.e. to ensure maximum comparability between Belgium and Denmark, the following rules apply: The “spin offs” in (a) will be considered displaced workers (note that movements within a firm are given first priority, i.e. “spin offs” within a firm are not considered displaced). The “take overs” in (b) will not be considered displaced workers (they are placed in the category “other workers”). In the American case, JLS, p. 707 states: “..[it is] important to account for cases in which a firm’s employer identification number (EIB) changes from one period to the next,”, and “In cases of mergers and divestitures that occurred during the sample period, we treated the separate parts as a single firm, even in years when they were legally distinct”.

A5. Public sector exclusion.

The present study considers only displacement from the private sector, public sector employees are excluded. The analysis of displacement from the public sector is problematic both in the Belgian and the Danish case. The Belgian data set contains no observations for some of the public sector employees. In the Danish case the present version of the IDA data base contains considerable measurement errors with respect to plant size. The exclusion of the public sector is only applied to the initial state. If a displaced worker get a job in the public sector the observation is kept in the sample, and the subsequent wage rate in the public sector job enters into the calculations.

In the JLS study there is no explicit discussion about this topic. Perhaps native American economist are supposed to know if the public sector is included in “ES202 data on firms’ employment”.

B. EMPLOYEE SIDE

B1. Multiple jobholders, identification of main employer, timing during the year.

For Denmark the IDA definition is taken. This means that employed workers at one particular date in the middle of November are assigned to the plant from which they got their main earnings. For Belgium the employer that comes closest to an employment relationship in November is taken. In most cases this amounts to the last employment relationship during the calendar year.

In the JLS study only one employer-employee relationship within a year is allowed. JLS, p. 707, states that the relationship is taken where there is the “Greatest amount of earnings during the year”.

B2. Multiple jobholders, more than one employment relationship by the end of the year

For Belgium those workers who have two jobs at the time of displacement and fulfill the tenure condition of 3 or more years of employment in *both* of the jobs are deleted from the sample. For Denmark IDA contains an indication of “side employment” besides the main job in November. The main November job is the one with the highest earnings. There is no tenure variable for these “side jobs”. Displaced workers with “side jobs” are retained in the calculations.

B3. Wages.

For Belgium wages are wage income per day. The numerator is the wage income during the year in the firm. The denominator is the number of days employed in the firm. For Denmark wages are wage income per hour. The numerator is the wage income during the year in the plant. The denominator is the number of estimated hours employed in the plant. The assessment of the number of hours worked is based on weekly contributions to a pension scheme, where the size of the contribution depends on the number of working hours. There are some measurement errors contained in the IDA measure of the number of hours worked.

The JLS study does not consider wages.

B4. Earnings, annual.

For both Belgium and Denmark we consider wage earnings during the calendar year. We include the wage income from all plants or firms that the worker has been employed at during the calendar year. Nominal earnings are deflated by the consumer price index in the two countries (this index is also used for deflating wages). We select workers with positive wage rates. In the Danish case we have only wage rates for workers who are employed at the November date, where workers are assigned labor market status including plant affiliation. These workers are the ones that are included in the table describing the development of wages after displacement (that is the only possibility for Denmark - we do not have wage rates for workers who are not employed at the November date). The figures that enter such an earnings table is the early earnings (wage income) from all employers (not only the employer at the November date). Such an earnings table will ensure comparability with the table over wage losses, the drop in earnings can be decomposed in a wage loss and a drop in hours. It is

exactly the same persons which enters in the wage table and the earnings table. It means, however, that we exclude many workers who have positive earnings during the year, but who are not employed at the November date. E.g. workers who are unemployed most of the year, but have just a small amount of working hours placed somewhere during the year (but not at the November date).

We also include displaced workers who do not have a positive wage rate. In the previous procedure we only included those worker who were so fortunate to have a positive wage rate after the displacement. The conjection must be that those workers who do not have positive wage rates fare worsen with respect to early earnings (or income). To the extent that there is a difference in the transition rates into other states than employment between the displaced workers and the control group, the above selection will underestimate the drop in yearly earnings as a consequence of displacement. A minimal extension of the sample in the previous procedure is to include workers who have positive yearly earnings in each of the years after displacement. This would be a sample selection where we come so close to JLS selection scheme as we can with the data bases at hand (we will experiment with that for Denmark). A further extension will be to extend the sample to workers who have positive earnings in just one of the years after displacement.

B5. Tenure condition.

In some cases we only consider displaced workers with 3 or more years of tenure at the year of separation. In the Danish data set we run into sample size problems, if the tenure condition is set higher. The Danish tenure variable is plant tenure while the Belgium one is firm tenure. In the JLS study the tenure condition is higher. This study only includes "...workers who had six or more years of tenure by the beginning of 1980" (p. 689).

B6. Migration and commuting from the area of interest.

In the JLS study for Pennsylvania this is potentially a severe problem. The solution applied according to JLS, p. 689 is: "... we have eliminated from our sample the approximately 25 percent of high-tenured separators who subsequently never have positive earnings in our data", and "Finally, to reduce biases due to sample attrition, we required that every worker receive some wage or salary earnings during each calendar year."

For Belgium and Denmark this is probably not a major problem, as the amount of commuting and immigration to other countries is limited compared to a single state in the US.

B7. Re-employment.

In the Danish data set a worker is considered re-employed if the worker has a job the next November, where each Danish resident is assigned one particular labour market status. For Belgium an employment and labour market status is constructed for each worker by the end of the year. This construction should come as close to the IDA definition as possible.

In the JLS study workers are considered re-employed if the wage income is positive each calendar year, JLS, p. 689.

B8. Comparison groups (for income and wage losses).

For Belgium and Denmark we select employees in one particular year, and comparison groups are found among these workers, i.e. workers who enter employment in the subsequent years are excluded from the analysis. The main comparison groups to the displaced workers considered in this study are all other workers and non-displaced workers in displacing establishments.

The JLS study considers different variants of control groups. JLS, p. 690 considers “separators”, which must be all workers leaving a firm. The separators are divided in “non-mass lay offs” and “mass lay offs” (the displaced workers according to the different selection criteria). The rest of the workers are labelled “stayers”.

C. OTHER ISSUES

C1. Years, sample period.

For Belgium the sample period is 1978-85. Dismissal is considered from 1983 to 1984. This makes it possible to trace the effect of displacement two years after the displacement. The maximum length of tenure in the Belgian data is six years. For Denmark the sample period is 1980-91. Dismissal is considered from 1988 to 1989. Calculations on the consequences two years after displacement is possible. The maximum length of tenure in the Danish data for the year 1988 is 8 years.

In the JLS study the sample period is 1974 through 1986. The observation unit is quarterly, the data are quarterly observations, although some of the conditioning is performed on a yearly basis.

C2. Aggregate economic conditions.

For Belgium and Denmark the years of displacement were moderate to severe with respect to economic activity.

For the JLS study, the conditions were unusually severe in Pennsylvania.

C3. Unemployment.

For Belgium there is information on the number of days unemployment benefit has been paid out. There is also information on the number of days of employment. For Denmark there is information on a quarterly basis on the share of the normal working time where unemployment benefit has been paid out. For both Belgium and Denmark we calculate the length of the unemployment spell after displacement before the entrance into a new job. The unit of measurement is months.

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