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Abstract:

We describe the size and timing for comprehensive as well as decomposed measures of unemployment in Finland and Sweden between 1990 and 2004. We then test for and confirm a change in the structural rate of unemployment by finding structural breaks in the Okun and Beveridge relations. Finally, we employ existing empirical models to examine the contributions of exogenous factors to the changes in the structural unemployment rate. We present separate estimates for the mid-1990s, late 1990s and early 2000s. They indicate that the structural rate has decreased in both countries, but has not returned to the levels of the 1980s.

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The crises of the 1990s and unemployment in Finland and Sweden

Klas Fregert and Jaakko Pehkonen

Introduction

The unemployment figures during the early 1990s crises in Finland and Sweden had not been experienced since the Great Depression, and even now, about 15 years later, unemployment is still considerably higher, by any measure, than the normal post-World War II level. In this chapter, we investigate the character and the causes of the unemployment crisis in Finland and Sweden and their aftermath. We ask if the current high unemployment in these two countries is a legacy of the earlier crises. Any attempt at evaluating the cost of the crises must take into account this possibility. Long-term forecasts as well as policy analysis will also depend on how the present unemployment rates came about.

The chapter is divided in four parts. In section 1, we present the unemployment outcome. We describe the size and timing for comprehensive as well as decomposed measures of unemployment. Through inspection of graphs, we look for indications of possible structural breaks that would indicate a change in the structural rate of unemployment. The purpose of the section is two-fold: to gain a sense of the welfare consequences of the unemployment crises in Finland and Sweden and to collect clues about the underlying causes.

In section 2, we investigate formally the division into temporary and permanent effects by testing for structural breaks in Okun and Beveridge relations. In section 3, we look at possible exogenous causes, again seeking indications of temporary versus permanent effects. Finally, in section 4, we employ empirical models to examine the contributions of the exogenous factors to the changes in the structural unemployment rate. We present separate estimates for the mid-1990s, late 1990s and early 2000s. They indicate that the structural rate has decreased in both countries, but has not returned to the levels of the 1980s.

1. The unemployment outcome: size and timing

Figure 1 displays the open unemployment rates for 1980-2004 according to survey measures and OECD standardized measures. The main difference between the two data sets is for Sweden where the OECD way of defining unemployment adds between 1 and 1.6 percent to

the official figures. The OECD correction stems mainly from the exclusion of students looking for work in the labor force survey.

Finland and Sweden *are alike* in the timing of the rise in unemployment from the trough in 1990 to the peak in 1994. They *differ*, however, in the magnitude of the initial rise and in the evolution of unemployment after the peak. The Finnish unemployment rate rose from 3 to 16 percent compared to the 2 to 9 percent increase in Sweden. Thus, the absolute increase in percentage points was roughly double in Finland (13 versus 7 percentage points). Regarding the timing of the recovery, Finnish unemployment has steadily decreased since the peak in 1994, while Swedish unemployment remained constant at between 9 and 10 percent (standardized figures) between 1994 and 1997.

The official (open) unemployment rate is a narrow measure as it fails to account for the possibility that some workers left the labor force as a consequence of the crises of the 1990s. The participation rate, the labor force divided by the working age population, is shown in Figure 2. Compared to the average of the 1980s, the participation rate declined in both countries by about 5 percentage points; in Finland from 76 to 71 percent and in Sweden from 80 to 75 percent and. Since 1994, the participation rate has increased slowly in Finland, while remaining roughly constant in Sweden. The coincidental timing of the decline in the participation rate and the increase in unemployment suggest that most of the decline was related to the deterioration in labor market conditions.

The people who left the labor force can be divided into participants in labor market programs, discouraged workers and others. Since participants in labor market programs and discouraged workers are directly linked to the labor market situation, a comprehensive measure of unemployment should include these two categories. Unfortunately, consistent data on the number of discouraged workers is not available for Finland. Therefore, two alternative measures that provide bounds on the possible size of the total unemployment effect are used here: the sum of the openly unemployed and participants in labor market programs, and the non-employment rate.

Figure 3 shows total unemployment defined as the sum of the openly unemployed and labor market participants. This measure removes most of the difference in timing observed in open unemployment in Figure 1 after the peak in 1994. Total unemployment steadily decreases in

both countries after the peak. The explanation lies in the different timing of labor market programs, as shown in Figure 4. Finnish programs did not reach their peak of 8 percent until 1997, while Sweden increased its programs more aggressively, reaching almost 6 percent of the labor force in labor market programs in 1994.

The non-employment rate, that is, one minus the ratio between employment and the working age population, is shown in Figure 5. This measure takes into account both the changes in the open unemployment rate and in the outflow from the labor force. Since part of the outflow from the labor force may be due to non-cyclical factors, such as increased enrollment in higher education, the change in the non-employment rate represents the upper limit of an increase in total unemployment. A difference in the timing of the recovery phase, seen in the open unemployment rate, is again evident: the recovery begins in Finland from the unemployment peak in 1994, whereas in Sweden the non-employment rate is constant until 1998. The difference in timing in Sweden between total unemployment and non-employment between 1994 to 1998 is due to a combination of an increase in discouraged workers and others that make up for the decrease in labor market program participants.

Since it is likely that most of the decrease in the participation rate is due to the labor market situation and as the effect is similar in both countries, the non-employment rate should give a better sense of the relative size of the underlying shocks than the open unemployment rate.[1] In Finland it rose by 15 percentage points, whereas in Sweden it increased by 10 percentage points. Thus by this measure, the Finnish crisis was 50 percent worse than the Swedish crisis.

We now turn to flow and duration statistics. Such data can give further insights into both the welfare consequences of the crisis and its underlying causes. The unemployment rate, or the non-employment rate, is at best an incomplete social welfare measure. Many would argue that an unemployed individual is harder hit than one who is employed. Furthermore, how hard the unemployed individual is hit depends on how long the unemployment spell lasts; one reason

[1] Data from the Swedish labour force survey give an indication of how important the discouraged worker effect is. The seven percentage points decline in the participation rate between 1990 and 1994 is roughly equal to 400 000 people. At the same time the number of discouraged workers increased by about 140 000. Thus at least a third of the decrease in the participation rate was due to the discouraged worker effect. At the same time, participation in labour market programs increased by 170 000 between 1990 and 1994. Thus, roughly 25 per cent of the decrease in the participation rate (90 000/400 000) was due to other reasons.

being that unemployment benefits are not perceived to compensate for the loss of income (even including increased leisure). Another reason is that unemployment may hurt long-term earnings potential. Finally, the psychic cost of being outside ordinary society can be high. All these costs increase with the length of the unemployment spell. Thus, the duration of unemployment spells is an important indicator in its own right. Duration is also closely related to the flow out of unemployment, or the job-finding rate, which makes it an alternative measure of the tightness of the labor market.

Figure 6 shows the average duration of incomplete spells of unemployment for Finland and Sweden during the period 1980-2004. The maximum duration is 40 weeks in Finland and 27 in Sweden. Duration reached its peak in Finland in 1994, while it had already peaked in Sweden in 1992. The recovery phase is also slightly different. Duration decreased steadily after 1994 in Finland, albeit at a decreasing rate, whereas most of the decline in Sweden occurred after 1998. The Finnish duration continues to be considerably higher than in the 1980s, whereas Sweden has returned to close to the levels of the 1980s. The faster decrease in duration after 1998 in Sweden is mirrored in a quick fall in the share of the long-term unemployed, as seen in Figure 7.

Figure 8 shows the inflow rates. Inflow is consistently higher in Finland. Since the unemployment rate is roughly equal to the inflow rate multiplied by duration (exactly equal in the steady state), we conclude that the permanently higher unemployment rate in Finland is due to a combination of longer duration and a higher inflow rate into unemployment. The Swedish inflow rate appears to have increased permanently and explains most of the permanently higher unemployment rate.

What accounts for the differences in inflow rates and duration? To gain additional insight into this issue, we turn to estimates of job creation and destruction in Finland, Böckerman and Maliranta (2001), and Sweden, Andersson (1999). The Finnish data cover the private non-farming sector, while the Swedish data refer more narrowly to the manufacturing sector. Unfortunately both data sets end in 1996. Figure 9 demonstrates how job destruction was consistently higher in Finland during 1988-1996. Since international data show that roughly half of all worker reallocations depend on new jobs being created and old jobs disappearing, it seems likely that the higher rate of job destruction in Finland explains the difference in the inflow into unemployment. The job creation data show a difference in level (higher in

Finland) as well as in timing. While job creation remained constant in Sweden during the crisis, it fell drastically in Finland. Thus, it seems the faster increase in duration in Finland during the downturn phase can be explained by the fall in the number of new jobs available for the unemployed.

To put the crises in the two countries into a broader perspective, Table 1 compares the crisis to previous crises and other OECD countries. The unemployment figures in both countries are more than double the second highest post-war peak. In a cross-country perspective, the Finnish crisis is near the top and Sweden's peak at the bottom in the OECD. In a long-run perspective, Sweden's crisis is a long way from the Great Depression peak of 23 percent, while Finland's crisis appears the worst during this century. To sum up, both countries' crises qualify as extreme crises when compared to their own post-war history, but only the Finnish crisis qualifies in an international perspective.[2]

Did the two crises differ from previous crises with respect to their broad macroeconomic development? Table 2 presents the basic price and quantity developments as measured by real labor costs and real GDP. GDP fell in both crises during the 1990s by about the same proportion relative to the absolute change in unemployment, in contrast to the previous crises when GDP grew. Real labor costs rose in both countries during the crises of the 1990s. The counter-cyclical real wage development is consistent with a fall in aggregate demand being propagated into a fall in real GDP.

We summarize our findings for the downturn and the recovery as follows:

The downturn: The two crises are alike in their initial timing as far as unemployment is concerned: both began in 1991 and peaked in 1994. Finland's crisis was deeper in both absolute and relative terms for all unemployment measures. A likely proximate explanation is the corresponding steep decrease in job creation in Finland, which did not occur in Sweden.

The recovery: Finland appears to have been in a recovery process since its peak in 1994 while Sweden's unemployment appears to have been remained at the peak level until 1998. After

[2] See, further, chapter 5 by Hagberg and Jonung. Böckerman and Kiander (2002), in turn, provide a detailed account of labor market adjustment channels during the great depressions of the twentieth century in Finland.

1998, the two countries also differ in that the inflow into unemployment and duration of spells of unemployment continued to decrease in Finland, whereas the recovery in Sweden is due mainly to a sharp decrease in the latter.

Are there signs of a permanent legacy? Table 3 compares the situation in 2002 and 1986, two years when the output gap was close to zero. In the early 2000s, unemployment is higher in both Finland and Sweden. In relative terms Sweden appears to have suffered the largest long-term increase, whether measured by the narrow standardized unemployment rate, the broad non-employment rate or the decrease in the participation ratio. The composition of the change is also different. In Finland, the duration of unemployment appears to explain most of the increase, whereas it is explained in Sweden by the inflow rate to unemployment. Finland also has a permanent legacy in terms of a higher share of long-term unemployed.

2. Did the crises cause permanent increases in unemployment?

Since unemployment rates have been going down in both Finland and Finland since their peaks in 1994, it is conceivable that they will return to their average levels of the 1980s. In that case, the structural rate of unemployment will not have changed. On the other hand, any such adjustment appears to have been slow, so it is also conceivable that unemployment will remain high for a long time, possibly never returning to its pre-crisis level. In this case, the structural rate of unemployment will have has increased. We examine these two possibilities formally by estimating bivariate Okun and Beveridge relations with structural breaks to allow for a shift in the mean of unemployment at the time of the crises as well as changes in the dynamics.[3]

Okun's law

Okun's law is an empirical law stating that an increase in the GDP gap (cyclical GDP), is associated with a certain decrease in unemployment. Given a stable relation, we can estimate the structural (natural) rate of unemployment as the rate that is consistent with a zero GDP gap. Here we test for a change in the structural unemployment rate, by testing if the relation shifted in the 1990s. We choose the simplest possible specification for the Okun relation

[3] In section 4.3, we also consider Phillips curve evidence from Turner et al. (2001).

consistent with previous empirical work. In particular, we adopt unemployment as the dependent variable and the GDP gap as the independent variable. We capture slow adjustment by adding one lag of unemployment as an explanatory variable.[4] We allow for a structural break by adding an intercept dummy and a slope dummy for the lagged unemployment term. The slope dummy also allows for a change in the dynamics. Thus the estimated regression is:

$$u_t = \alpha_0 + \alpha_1 D_t^{1990s} + \alpha_2 u_{t-1} + \alpha_3 D_t^{1990s} u_{t-1} + \alpha_4 Gap_t + \varepsilon_t$$

where *u* is the unemployment rate, *Gap* the output gap and D_t^{1990s} is a dummy equal to one for 1992-2004, and zero otherwise. The coefficient on the lagged unemployment term is α_2 in the 1980s and $\alpha_2 + \alpha_3$ in the 1990s. The associated long-run relation, "the Okun curve", is found by setting $u_t = u_{t-1} = u^*$, and $\varepsilon_t = 0$:

$$u = \frac{\alpha_0 + \alpha_1 D_t^{1990s}}{1 - \alpha_2 - \alpha_3 D_t^{1990s}} + \frac{\alpha_4}{1 - \alpha_2 - \alpha_3 D_t^{1990s}} Gap = u^* + u^{cyclical}$$

If either one of the dummies are statistically significant (by themselves or together), there is a significant shift in the Okun relation. The structural rate of unemployment is found by setting the GDP gap equal to zero.

The results are displayed in Table 4 and the estimated relations together with the data are shown in Figure 10. The intercept dummies in the two countries are not statistically significant. The dummy is close to zero in Finland, while it increased in Sweden. The slope dummies indicate a slower response of unemployment to a shock in the GDP gap or the error term for both Finland and Sweden, but the effect is only statistically significant for Finland.

The estimated change in the structural rate of unemployment is 3.9 percent for Finland and 2.9 percent for Sweden. Both changes are statistically significant (< 1 percent) by the Wald test. Thus, the two dummies are statistically significant together for Sweden, although insignificant by themselves.

[4] Gylfason (1997) estimated versions of Okun's law for Sweden with lagged unemployment.

According to the estimates, both countries have been close to their estimated long-run relations for the period 1995-2004, as shown in Figure 10. This finding together with the fact that the GDP gap was positive between 1998 and 2002, imply that unemployment has been below the structural rate in the late 1990s for both countries.

The Beveridge curve

The Beveridge curve is bivariate relation that can be used in an analogous fashion to Okun's law to test for a change in the structural unemployment rate. Arguably, it is more attractive than the Okun relation since it can be derived from reasonable micro foundations that explicitly focus on the matching process.[5]

Following Jackman et al (1990), the effects of three categories of shocks can be distinguished as depicted in Figure 11. First, a cyclical shock generates a movement along the negative long-run Beveridge curve. Realistically, adjustment occurs as counter-clockwise loops around the curve as a fall in the demand for labor first increases the inflow into unemployment and then increases the outflow until a new equilibrium along the curve is reached. Second, a mismatch shock reduces the amount of matching between workers and jobs and increases unemployment at each level of vacancies. It arises from either a change in the amount of matching to be done or in the quality of the matching process. The amount of matching to be done depends on job flows due to job creation and destruction as well as on worker flows. The quality of the matching process depends on the amount and intensity of search activity by job searchers and employers. Third, hysteresis shocks are mismatch shocks that are triggered by cyclical shocks through hysteresis mechanisms.

In an analogous specification to the Okun relation, we attempt to distinguish between cyclical movements and a horizontal shift in the curve which indicates a change in the structural rate of unemployment. Thus, we estimate the following dynamic equation:

$$\ln u_t = \alpha_0 + \alpha_1 D_t^{1990s} + \alpha_2 \ln u_{t-1} + \alpha_3 D_t^{1990s} \ln u_{t-1} + \alpha_4 \ln v_t + \varepsilon_t$$

[5] Blanchard and Diamond (1989) provide theoretical underpinnings for the Beveridge curve and introduces it as a tool for distinguishing between different shocks. Other empirical applications that use the Beveridge curve to distinguish between structural and cyclical shocks are, inter alia, Jackman et al. (1990), and Nickell and van Ours (2000).

where *v* is the vacancy rate (vacancies divided by the labor force). The Beveridge curve is estimated in logarithms to allow for a convex shape. The coefficient α_1 measures the change in the intercept and the coefficient α_3 measures the change in the effect of lagged unemployment, that is, a change in the dynamics.[6] The associated long-run relation, "the Beveridge curve", is found by setting $\ln u_t = \ln u_{t-1} = \ln u$, and $\varepsilon_t = 0$:

$$\ln u = \frac{\alpha_0 + \alpha_1 D_t^{1990s}}{1-\alpha_2 - \alpha_3 D_t^{1990s}} + \frac{\alpha_4}{1-\alpha_2 - \alpha_3 D_t^{1990s}} \ln v \Leftrightarrow u = e^{\frac{\alpha_0 + \alpha_1 D_t^{1990s}}{1-\alpha_2 - \alpha_3 D_t^{1990s}}} \cdot v^{\frac{\alpha_4}{1-\alpha_2 - \alpha_3 D_t^{1990s}}}$$

If either one of the dummies are significant, there is a shift in the Beveridge curve.

Table 5 gives the results. The estimated coefficients on lagged unemployment indicate a change in the dynamics towards slower adjustment in Finland but not in Sweden. The 1990s coefficient on lagged unemployment in Finland is both statistically and economically different from the 1980s coefficient. The intercept dummy is higher for Sweden in the 1990s, but not significantly higher. Figure 12 shows the data together with the estimated long-run relations, where a larger shift is evident for Finland. The estimate of the change in the structural rate of unemployment, the horizontal shift of the Beveridge curve, depends on what is considered a normal level of vacancies. A reasonable estimate is the mean for the whole period 1980-2000. The shift in Finland is 5.8 percentage points, which is fairly close to the univariate (6.6) and the Okun estimate (6.7). The shift in Sweden is 1.2 percentage points, which is considerably lower than the Okun estimate (3.9). For Sweden this is also close to the maximum horizontal difference between the two estimated curves. The shift in Sweden is, however, not precisely estimated with high *p*-values for the dummy effects. The reason for the imprecision is suggested in Figure 12: if the Beveridge curves had been slightly more convex, the shift would have been considerably larger.

Summary of the evidence

[6] Jackman et al. (1990) estimated Beveridge curves for 14 countries for the period 1971-88 with unemployment as the dependent variable and the vacancy rate and lagged unemployment as independent variables, all in logarithmic form.

Table 6 summarizes the estimates of the structural rate of unemployment developed above with the added estimates from a third classic bivariate unemployment relation, namely, the Phillips curve from a study by Turner et al (2001). For Finland, there is a high degree of agreement between all the estimates that the change in the structural rate of unemployment is between 6 and 6.7 percent. For Sweden, the low estimate from the Beveridge curve, implying a 1.6 percent change, stands out from the estimated changes of between 3.7 and 4.9 in the other approaches. We found, however, that the shift in the Beveridge curve in Sweden was imprecisely estimated.

Given the high degree of agreement across approaches and the statistical significance of the changes, we conclude that it is highly probable that a large shift in the structural unemployment rate occurred in both Finland and Sweden during the 1990s. A conservative estimate is that the structural rate of unemployment doubled in both countries in the 1990s.

3. Structural changes in the labor market

This section describes the evolution of possible factors behind the change in the structural unemployment rate. We first look at changes in the composition of employment across sectors and types of contracts, which may be linked to different long-run unemployment risks. We then consider institutional developments of the labor market, including changes in employment protection, unemployment insurance, active labor market policies, wage bargaining, and taxes. Such factors, shown to affect the structural rate of unemployment as well as the speed of adjustment to shocks, are used in the panel data tests in section 4.

Relative labor demand shifts

We begin by looking at the composition of employment across production sectors and employment contracts. Then we consider full-time versus part-time employment contracts and permanent versus temporary employment contracts. Since different sectors and contracts may display different long-run structural rates of unemployment, a proximate cause of an increase in the overall structural rate could be a shift from low to high unemployment sectors or contracts. Figures 13 to 16 suggest that the following changes are connected with the crisis.

In Sweden, there was a rather substantial *cyclical increase* in part-time work from 1991 to 1994, part-time work showing a rise of up to two percentage points over the four-year period. Presumably, this work-sharing dampened the rise in unemployment in Sweden. However this did not happen in Finland. In Finland, in turn, the share of temporary employment went up by about two percentage points over the first years of the crises. In Sweden, the opposite happened: the share of temporary employment declined in 1990 and 1991. There was a small *cyclical increase* in the share of public sector (state and local) employees in both Finland and Sweden during the downturn phase. In any case, public sector employment decreased absolutely in both countries and hence did not act as a buffer. In Finland, public sector employment has shown a steady rise since 1994, attaining the peak level of the year 1990 in 1998. In Sweden, public sector employment is still about 10 percent lower than in 1990.

There was a *permanent decline* in the share of employment in construction in both countries, especially in Finland where employment decreased by almost 50 percent. This decline is, at least to some extent, linked to the boom-bust cycle in the construction sector as described in chapter 2. The cycle left a legacy of new buildings, especially office space, with a resulting decrease in the demand for new buildings. Demand had still not recovered in 2004. Construction is typically a sector with relatively high unemployment. So the decline in this sector should reduce the structural rate of unemployment in the long run, but may cause higher mismatch and thus higher unemployment in the medium run.

There was a *permanent increase* in the share of temporary work contracts in both countries, with an increase from a constant level in Finland and a reversal from a decline in Sweden. Ceteris paribus, this increases the structural rate as the inflow to unemployment increases. Holmlund and Storrie (2002) note the concurrent permanent increase in the inflow rate in Sweden and attribute 50 percent of this increase to the increased use of temporary contracts. Their prime candidate explanation is that the recession increased uncertainty and thereby gave incentives to both employers and employees to accept temporary contracts, while they rule out large effects from the legislative changes that occurred in this period. The Finnish case appears to be similar. Over the period 1993-2004 about 60 percent of new contracts were temporary. This behavior suggests hysteresis: the recession triggered a temporary increase, but the effect was permanent.

Finally, some trends appeared to be unaffected by the crises. The declining (increasing) trend in the share of agriculture and forestry (services) continued in the 1990s and in the 2000s in both countries. Part-time work decreased throughout the 1980s and 1990s in Sweden, while increasing in Finland, seemingly converging at around 12 percent. To conclude, the only structural change in labor market demand that appears to be connected with the crises in both Finland and Sweden, and with the potential for increasing the structural unemployment rate, is the increasing share of temporary employment.

Employment protection legislation

The purpose of employment protection legislation (EPL) is to make it harder to fire employees. Theoretically EPL has an ambiguous effect on structural unemployment. On the one hand, EPL makes it more risky for employers to hire new employees and thus the outflow from unemployment decreases, which in turn increases unemployment. On the other hand, EPL decreases unemployment through several possible channels. First, EPL reduces the number of unfair dismissals and thus the inflow into unemployment. Second, EPL creates incentives for on-the-job-training, which increases the outflow rate from unemployment, as it becomes easier for better-trained workers to find new jobs. Third, EPL increases on-the-job-search by increasing the incentive for the employer to give advance warning of firing. This reduces the inflow from employment as well as increases the outflow from unemployment.[7]

Table 7 presents measures on the strictness of EPL in Finland and Sweden provided by the OECD for the late 1980s, the late 1990s and early 2000s. Both countries are in the middle of the distribution in all periods, with Finland ranking 12 and Sweden 16 in the late 1990s, compared to highest strictness ranking of 26. Both countries have increased flexibility since the late 1980s. According to the absolute change in the index, the change towards flexibility from the late 1980s to the late 1990s was marginal in Finland (2.3 to 2.0) and substantial in Sweden (3.5 to 2.2). The international rankings for both countries have however fallen and Finland and Sweden have both become relatively stricter.

Finland is on a similar level as Sweden, that is, both are middle-ranked countries in the regulation of both regular and temporary jobs. With respect to collective dismissals

[7] See OECD (2004) and Nickell and van Ours (2000) for recent empirical accounts.

regulation, Finland is less stringent than Sweden. There were some changes in Finland towards greater flexibility in the late 1990s. These mainly occurred in the regulation of permanent work, as shown in Table 7. In particular, there is now more flexibility in local arrangements regarding working time. Furthermore, the period of notice in the case of individual dismissals has been reduced from one month to two weeks if employment has lasted less than one year. Collective temporary layoffs are now possible at 14 days' notice and the new Co-determination Act cut the negotiation period from three months to two months. On the other hand, there are more restrictions on temporary work. In essence, workers with successive contracts are, to a limited extent, entitled to the same benefits as workers in permanent jobs.

Sweden's ranking in employment protection for regular jobs reflects on the one hand strict rules on length of notice and on the one other liberal rules for redundancy pay (none) and liberal reasons for collective dismissal. The changes in Sweden towards greater flexibility have occurred in the regulation of temporary work, as seen in Table 7.[8] First, private temporary work agencies were allowed from 1993. These companies provide brokerage services and, most importantly, rent temporary workers. They were supplying 24 000 employees (0.6 percent of the labor force) by the year 2000. Second, the restrictions on temporary work contracts were relaxed in 1997 to allow for temporary work contracts for no specific reason (such as temporary workload, or temporary vacancies).[9] The employer is restricted to no more than five such contracts and for any individual their accumulated length may not exceed 12 months during a three-year period.

Active labor market policy

[8] Besides these changes, reform of labour legislation was on the political agenda in Sweden during the 1990s. In 1994, the Employment Protection Act (*Lagen om anställningsskydd*) of 1974 was also changed in several respects by the center-right government. However, the change had only lasted for a year, when the Social Democrats took power. The most important change was allowing two persons to be exempt from the seniority principles governing firing in small companies (less than ten employees). In 1994, the maximum duration of temporary work contracts was also extended to twelve months, but it is estimated that the new law had practically no impact during the short time it was in force. The exemption from seniority was reinstated in 2000 by the Social Democratic government as part of a deal with the Green party.

Like employment protection legislation, active labor market policies (ALMP) have several potential effects, which go in different directions. At the macro level, ALMP may increase real wages, and hence unemployment, by diminishing the current threat of unemployment. At the micro level, there are two opposing effects. First, ALMP may diminish search activity and so lead to longer duration of unemployment. Second, ALMP may increase the chance of employment through better training. Empirical studies suggest that ALMPs lower the structural unemployment rate although the estimates are not robust - in many cases they depend on the inclusion of Sweden in the data set.

Figure 17 shows that Finland spends considerable less on ALMP than Sweden, when measured by expenditures on ALMP in relation to GDP. The total amounts spent on unemployment (active and passive measures) are, however, roughly of a similar order, due to higher unemployment in Finland. Figure 17 illustrates that both total spending and the composition into passive and active measures returned to their pre-crisis level. Thus, there has been no a significant structural change in ALMP that potentially could explain a change in structural unemployment. This does not, however, rule out possible effects due to changes in the composition of programs since a number of new programs were introduced in both Finland and Sweden during the 1990s. For example, Finland introduced a part-time work supplementary benefit and a job-sharing program, following a trainee-work scheme with labor market subsidy launched in 1993. In Sweden, several new subsidized youth trainee programs were introduced.

The possible impact of active labor market policies on structural unemployment can be evaluated by measures that control for cyclical effects. Figure 18 depicts one such a measure, the so-called accommodation ratio, which is calculated as the share of active labor market policy participants in total unemployment.[10] The measure implies that Finland has had a less ambitious approach to active measures than Sweden. On average, the accommodation ratio has been less than 30 percent in Finland and about 40 percent in Sweden. The Figure 4 shows that the accommodation ratio diminished considerably in both countries in the early 1990s,

[9] Holmlund and Storrie (2002) provide a detailed discussion of temporary work in Sweden. As mentioned above, they argue that these legislative changes have had little effect.

[10] This measure is used, inter alia, by Forslund and Kolm (2000). It can be given two interpretations. First, it measures the willingness of policy-makers to accommodate unemployment by ALMP. Second, it measures the individual's change of ending up in an ALMP program.

after a previous upturn in the mid 1980s. In addition, Finland has gradually approached the Swedish level: the gap of about 20 percentage points of the 1980s and early 1990s in the accommodation ratios plummeted to about 5 percentage points in the early 2000s.

Figure 19, in turn, shows the proportion of persons in ALPM in training programs (not including youth trainee programs). The proportion has remained fairly constant in Finland between 35 and 40 percent, whereas in Sweden it has been strongly counter-cyclical, coming down from a peak of about 60 percent in 1990 to around 20 percent in 2004. During the downturn, a large fraction of new entrants into ALMPs entered to non-education programs, including work schemes.

To sum up, AMLPs increased during the crisis in both Finland and Sweden, but then swiftly reduced below to their pre-crisis levels. Otherwise no permanent changes appear to have occurred in the general composition of ALMPs. In both Finland and Sweden, the focus has been on temporary jobs in state offices, municipalities and placement in the private sector.

Unemployment insurance

The theoretical literature emphasizes the adverse effects of unemployment benefits: they generate unemployment by reducing the cost of unemployment. This raises the reservation wage, leading to longer search periods, thus lengthening the average duration of unemployment spells. This traditional view has received empirical support. However, in many cases unemployment effects are unclear and depend on the institutional arrangements of the labor market. For example, the magnitude of the effect tends to vary with the structure of the benefit system, including duration, type (flat, means-tested) and eligibility conditions. Furthermore, the financing of benefits seems to affect the outcome.

In Finland, unemployment benefits consist of three components: earnings-related unemployment allowance, basic unemployment allowance and, from 1996 onwards, labor market subsidy. Earnings-related benefits are administered by trade unions. In 2005, this system covered about 50 percent of those receiving benefits. Labor market subsidies and basic unemployment allowances are both administered by the Social Insurance Institute. In 2005,

the average daily compensation for a member in an insurance fund was about 45 euros. In the case of a fixed benefit, it was 24 euros.[11]

The system is basically the same in Sweden. There is an earnings-related system administered by trade unions and a fixed allowance for those not qualified, due to lack of previous membership and work experience, administered by the government. Also coverage and rates are comparable: in Sweden about 60 percent of the unemployed are covered by the earnings-related system and the fixed government allowance accounts for about 60 percent of the average union member's allowance.

Figure 20 depicts the evolution of replacement rates. In the case of Finland, the replacement rate is calculated by weighting the average benefit paid (net of taxes) in different systems by their relative shares (number of days). This is divided by the average wage (net of income taxes). In Sweden, the replacement ratio is calculated for the earnings-related system based on the maximum allowance, which a majority of the beneficiaries receive.[12]

In both Finland and Sweden, the replacement ratio has diminished since its peak in 1992. Thus the changes in the unemployment benefit system have worked in the direction of lowering the structural rate of unemployment. In Finland, the increase in the relative share of unemployed individuals receiving the fixed allowance explains the largest part of the decline in the average replacement rate. In Sweden, the reduction has been caused by a combination of lower percentage compensation for earnings-related benefits, caps on earnings-related benefits and an increase in wages.

Wage bargaining system

The degree of centralization of wage bargaining has been linked both to the degree of nominal wage sluggishness and to the equilibrium level of the real wage, and thus also to structural unemployment. The effect of the degree of wage co-ordination on the structural rate of

[11] The labor market subsidy and the basic benefit are means-tested and paid for an unlimited period. Earnings-related benefit is paid for a maximum of 500 days. Those who turn 59 before the benefit expires are entitled to an extension until the age of 60. Before 2005 (1997), the age limit for the extension of benefits was 57 (55).

[12] Although these two series are not directly comparable, the relative change over the period is independent of the definition chosen.

unemployment is linked to the bargaining strength of the labor unions. Strong unions with wide membership, as is the case of Finland and Sweden, tend to raise wages and thus increase unemployment. If, however, unions can co-ordinate their actions and agree on wage moderation, the adverse effects of their behavior are mitigated. In an economy with large and powerful unions, there is an economic rationale for the co-ordination of wage bargaining.

According to Calmfors (2001, Table 2), both Finland and Sweden moved towards decentralized wage bargaining in the mid 1990s. He considers both intermediate countries, although Sweden has gone a bit further than Finland. The centralization/co-ordination index, varying from 0 (no centralization) to 1 (complete centralization), changed from 0.58 to 0.47 in Finland between the periods 1983-87 and 1993-97. In Sweden, the index decreased from 0.49 to 0.39. In the late 1990s wage bargaining in Finland became, once again, more centralized. Between 1996 and 2005 there was only one year with decentralized bargaining, namely the year 2000. Sweden moved towards informal wage coordination through general agreements on the procedural rules for wage bargaining, starting in 1996 in the industrial sector, and extending thereafter to other sectors. Furthermore, a new government mediation institute was set up in 2000. Studies of wage formation suggest that wage formation has been stable in Sweden and therefore that informal rules have replaced previous formal coordination, see Holmlund (2006) and Nymoen and Rödseth (2003).[13]

The shift towards decentralized wage bargaining in Finland in the mid 1990s and Sweden over the 1990s suggests that the speed of adjustment to shocks decreased and that the structural rate of unemployment went up. In this view, the shift towards more decentralized wage bargaining in the early 1990s, while both countries were hit by the largest down-turn in the post war period, were indeed ill-timed.

Tax and price wedges

The theoretical literature suggests that tax and price wedges affect employment and unemployment. The wedge between the real cost of a worker to the employer and the real consumption wage of the worker is composed of payroll taxes, income taxes, consumption taxes and the price of imported goods. Higher consumption or income taxes, or a rise in the

[13] See also Marjanen (2002) and Ahtiainen (2007) for an account of Finnish bargaining in the 1990s.

price of imported commodities require higher nominal wages to sustain the same after-tax purchasing power. Similarly, higher payroll taxes increase real labor costs. A higher wedge leads to inflationary pressures and to a rise in structural unemployment if workers attempt to maintain their living standards. This is true at least in the short run. In the long run, the impact of a higher wedge will depend on how the tax burden and changes in the price of foreign commodities ultimately affect real labor costs.

Taxes that affect the cost of labor are high in Finland and Sweden by EU standards. During the 1990s employer costs were almost double the take-home pay of the employee, taking into account the payroll, income and value-added taxes; see Figure 21. Both in Finland and Sweden, the tax wedge grew in 1992-1996. It remained stable over the period 1997-2000, finally slowly declining towards its pre-crisis level in 2001-2005. In Finland, the tax wedge continues to be above the pre-crisis level and the increase in it coincided with the rise in unemployment. Although the causality is not clear, the adverse effects of the increase in the tax wedge on unemployment cannot be ignored.

Tax reforms lowered the Swedish tax rate temporarily in the early 1990s. As in Finland, there was a modest decline in the tax wedge in the early 2000s. The price wedge went up after 1991 in both Finland and Sweden due to currency depreciation, but then moved back slightly. The price wedge remains lower than it was in the 1980s.

To sum up, neither the tax wedge nor the price wedge is a likely candidate as a major cause of the increase in unemployment in Sweden, although temporary effects cannot be ruled out. In Finland, the negative effects of the increase in the price and tax wedge in the early 1990s are likely to be stronger and last longer than in Sweden.

Summary

The evidence on the evolution of the institutional determinants of structural unemployment points in different directions. Comparing the early 1990s with the early 2000s (see Appendix 1 with averages for five-year periods) indicates that there are two factors in both countries that imply a lower structural unemployment rate: the replacement rate and union bargaining power. The comparison of the late 1990s to the early 2000s suggests one additional positive

factor, the tax wedge. Similarly, an increase in active labor market policies in the first part of the 1990s, measured by the share of ALMP of GDP, suggests a lower structural rate for the early 1990s but a higher rate for the late 1990s and early 2000s. An alternative ALMP measure, active spending per unemployed, in turn, indicates a higher structural unemployment rate for all the post-crisis years. As above, this applies in both countries. Numerical summary estimates of employment protection, union and employer co-ordination and union coverage, both for Finland and Sweden, remain unchanged over the period, although there were signs of a change towards decentralized bargaining in the mid 1990s in both countries, particularly in Sweden.

4. Evidence from panel data studies

This section surveys the empirical evidence on the link between structural unemployment and its causes in Finland and Sweden. We begin by reviewing existing estimates. This will be followed by an account of new estimates for the 1990s and early 2000s, carried out by updating and utilizing the results of existing models. This augments the bivariate evidence reported earlier. Our analysis may provide an insight into this issue and thus lessons for policy.

Existing estimates

The empirical evidence stems both from panel studies that exploit variation across time and countries, and from single-country studies that only exploit the variation across time. Typically, panel studies use reduced-form unemployment equations with several explanatory factors. Single-country studies generally use only univariate or bivariate regressions. Below we classify previous empirical studies according to the data. First we review panel data evidence (Table 8) and then country evidence (Tables 9 and 10).

Table 8 depicts recent panel data estimates of structural unemployment in Finland and Sweden. For purposes of comparison, it also shows estimates for the US and OECD-Europe, when possible. The studies considered are Scarpetta (1996), Elmeskov, Martin and Scarpetta (1998), Layard and Nickell (1999) and Blanchard and Wolfers (2000).[14] In these studies

[14] Recent studies also include Daveri and Tabellini (2000). Unfortunately, we were not able to derive their estimates of structural unemployment for Finland and Sweden. Their study,

estimates are derived from parameters of a reduced-form unemployment rate equation. The set of explanatory variables typically includes proxies for unemployment benefits (level and/or duration), active labor market policies (expenditures per GDP or per person), bargaining structures (measured by co-ordination, union density and coverage), employment protection (length of notification, severance payments), tax wedge (labor, income and consumption tax rates) and cyclical fluctuations that control for deviations between structural and actual unemployment (measured either by change in inflation, output gap, interest rate or by time dummies. In all cases the data is annual and typically consists of at least two cross-sections, generally one from the early 1980s and one from the early 1990s. The most recent data is used in Blanchard and Wolfers (2000) where the last cross-section ends in 1995/1996. The number of countries included in the studies varies from 15 to 21.

The results of the study by Scarpetta (1996) suggest that structural unemployment increased in the European OECD countries by approximately four percentage points from the early 1970s to the mid 1990s. In the US, it rose by one percentage point. For Finland and Sweden the estimates are considerably higher at 11 and 3.7 percentage points, respectively. In both cases the increase is mainly attributed to higher unemployment benefits and militant labor unions. As the study focuses on change over a long time period, it is not well suited to the Finnish and Swedish cases where the change occurred in the early 1990s, as opposed to the early 1980s in the case of the other OECD countries.[15]

The results of Elmeskov et al. (1998) indicate that structural unemployment increased in Europe on average by 1.5 percentage points from the mid 1980s to the mid 1990s. In the US, it fell by one percentage point. According to the study, Finland and Sweden have both performed extremely badly. In Finland, the structural unemployment rate has risen by more than 10 and in Sweden by more than 4 percentage points. In both cases, the rise stems mainly from unidentified country-specific factors.

The results of Layard and Nickell (1999) indicate that structural unemployment increases with higher unemployment benefits, stronger trade unions, higher taxes and a higher home-owner occupier rate. Wage co-ordination between unions and employers and active labor market

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however, provides evidence on the role of taxes, unions and benefits in the rise of unemployment in these countries.

[15] The panel, in fact, excludes data for Finland for 1992-1993.

policies, in turn, decrease unemployment. Estimates of the structural unemployment rate are 9.0 for Finland and 3.0 for Sweden. The difference is almost entirely due to one factor: the extent of active labor market policies. At the Finnish level of active labor market policy, Swedish unemployment would be around 5-6 percentage points higher.

Blanchard and Wolfers (2000) construct country-specific time series for shocks (productivity, real interest, shifts in labor demand) and allow for interactions between shocks and institutions. They conclude that interactions account rather well for the rise and heterogeneity in the evolution of actual unemployment in Europe. Crude estimates of the structural unemployment rate for the early 1980s for Finland and Sweden are 5 and 2 percent, respectively. For the mid-1990s, the corresponding numbers are 16.0 and 4.5.

Tables 9 and 10 provide a summary of time series studies reporting estimates on structural unemployment. The evidence by and large accords with the findings from the panel studies. In short, the results for Finland indicate that the structural unemployment rate in the mid 1990s was in the range 7-12 percent. The highest estimates are reported in Holm and Somervuori (1997), the lowest estimates by Kiander and Pehkonen (1999), OECD (2000) and Rasi and Viskari (1998). The OECD results imply that the NAIRU rose significantly from the mid 1980s to the mid 1990s. The results for 1999, in turn, suggest that the NAIRU had fallen about 1.5 percentage points from its highest level.

Forslund (1995), Apel and Jansson (1999), OECD (2000) and Hjelm (2003) provide estimates on structural unemployment in Sweden. Forslund (1995) estimates equations for wages, prices and trade balance. OECD (2000), Apel and Jansson (1999) and Hjelm (2003) apply the method of unobserved components to data on unemployment, inflation and output. In short, the results indicate that structural unemployment in Sweden rose by about 2-3 percentage points in the early 1990s, the average estimate for the mid 1990s being about 5 percent.

Causes and updates

Tables 11-13 summarize the evidence on causes underlying changes in unemployment for the early 1990s, late 1990s and early 2000s, respectively. The purpose of the exercise is to investigate the performance of the existing models in explaining the observed decline in the Finnish and Swedish unemployment rates since the mid 1990s. The contributing factors are

divided into six main groups: taxes, benefits, unions, active labor market policies, shocks and other factors. Estimates have been calculated by using impact coefficients and the average values of the independent variables between 1985-89 and 1990-94 (Table 4.11), between 1990-94 and 1995-1999 (Table 12) and between 1995-99 and 2000-2004 (Table 13).[16]

In Finland, the rise in actual unemployment in the early 1990s is mainly accounted for by shocks and unidentified country-specific factors. On average, they indicate an increase of about 6-7 percentage points in the structural unemployment rate; see Table 11. The highest estimates are by Scarpetta (1996) and Elmeskov et al. (1998), who attribute the rise in unemployment to the rise in output gap, indicating an increase of around 4.5 percentage points. Layard and Nickell (1999) associated the increase in unemployment to falling inflation, the estimate being about 3 percentage points. The estimate of Blanchard and Wolfers (2000), in turn, consists of an increase in the interest rate, decrease in total factor productivity and an adverse labor demand shift over the period. Institutional variables (taxes, unions, benefits and labor market policies) play a substantial role, although they are less significant than cyclical factors. Altogether the institutional variables indicate an increase of one percentage point in Finnish structural unemployment.

In Sweden, as in Finland, the main evidence points towards shocks. The highest estimates are, again, by Scarpetta (1996) and Elmeskov et al. (1998), suggesting an increase of around 3 percentage points in the unemployment rate. The absence of an adverse effect of shocks in Layard and Nickell (1999) and Blanchard and Wolfers (2000) is due to two factors: there is no change in inflation[17] and the effect of the increase in the real interest rate is counterbalanced by a positive change in productivity of approximately the same magnitude. As in Finland, modest adverse effects stemming from higher benefits, union activity and unidentified factors are reported in Scarpetta (1996) and Elmeskov et al. (1998). A decrease in structural

[16] See Appendix 1 for the period means and Appendix 2 for the coefficients. In the case of Elmeskov et al. (1998), we divide the country-specific effects reported in the study into shocks and "others" using the OECD's output gap estimates (a shock) and reported impact coefficients. In the case of Blanchard and Wolfers (2000), we ignore the interaction terms since the Finnish and Swedish economic institutions are alike in many respect. See Appendix 4.3, which show that this simplification does not affect the results, since the implied range of effects across these two countries is small.

[17] In Sweden, the inflation effect depends on how the periods are divided. For example, the use of end-period values (1989 versus 1994) imply decrease in inflation of about 3 percentage points and thus an increase in unemployment of about 0.6 percentage points.

unemployment due to a lower tax wedge is reported by Layard and Nickell (1999), Blanchard and Wolfers (2000) and Elmeskov et al. (1998). They all, however, indicate a corresponding rise in structural unemployment due to a decrease in the extent of active labor market policies.[18]

Tables 12 and 13 provide similar accounts for the late 1990s and the early 2000s. In both countries there are two distinct factors that, according to the empirical studies, should have lowered unemployment over the period, namely, the fall in the replacement rate and unionization. In Finland, the average replacement rate decreased by about 9 percentage points, from 56 to 47 percent. In Sweden, the maximum replacement rate dropped from about 87 percent in the early 1990s to 69 percent in the early 2000s. Union density, in turn, fell by about 8 percentage points in Finland and 5 in Sweden. A lower level of active labor market policies, in turn, should have increased unemployment in both countries over both periods. The relative decline in expenditures on active labor market policies since the mid the 1990s has been about 20-50 percent, depending how the extent of active policies is measured. The evolution of the tax wedge, and thus its impact on unemployment, varies across the periods. In the late 1990s, the wedge increased in Finland and Sweden, rising by about 12-13 percentage points. In the early 2000s, it declined by 7 percentage points in both countries.

As Table 12 shows, the increase in the tax wedge imposed upward pressure on unemployment over the late 1990s in both Finland and Sweden. The estimates are, however, rather imprecise, varying from zero to three percentage points; see column 1. These adverse effects are largely offset by a decline in unemployment benefits and union power; see columns 2 and 3. In the early 2000s taxes were lowered in both countries, resulting in a substantial decrease in unemployment; see column 1 of Table 13. A continuing decline in unemployment benefits and union density over the period 2000-2004 enhanced this positive trend. Depending on the study, these institutional variables predict a fall in the unemployment rate of about one percentage point in both countries. These positive effects are partly offset by a decline in the

[18] The tax effects show up more strongly in the time series studies than in the panel data studies. This result may reflect the fact that both unemployment and taxation (both of which showed an increase in the 1990s) are determined simultaneously by a third factor, which is not captured by time series analysis. On the other hand, with the exception of Blanchard and Wolfers (2000), the panel data studies report considerable country-specific, and thus unidentified factors, which are absent from the time series studies.

extent of active labor market policies. Cuts in active expenditures increased unemployment in both Sweden and Finland by about 0.5 percentage points in the early 2000s.[19]

As in the early 1990s, cyclical factors have an important role in explaining the evolution of unemployment in the late 1990s and early 2000s. Their role is somewhat stronger in Finland than in Sweden. The decline in real interest rates was particularly marked, from about 6 to 2 percent over the period in both countries. This boom-bust-recovery cycle shows up in the output gap and inflation. The output gap of a magnitude of about 4-6 percent of GDP faded away in both in Finland and Sweden. This happened without an increase in inflation, indicating that the actual unemployment rate exceeded the structural unemployment rate.

The contributions summarized in Tables 12 and 13 suggest that in Finland a decline in the real interest rate, coupled with a decline in the output gap, reduced unemployment by about 2 percentage points in the late 1990s and, again, by a similar amount in the early 2000s; see the estimates by Scarpetta (1996), Elmeskov et al. (1998) and Blanchard and Wolfers (2000).[20] In Sweden, the impact was about 1 percentage point in each period; see column 7 of Tables 11 and 12.

All things considered, the evidence of the panel data models over the period 1990-1999 is somewhat mixed.[21] Two studies, Elmeskov et al. (1998) and Layard and Nickell (1999), indicate that adverse developments in institutional factors increased structural unemployment considerably in the late 1990s, while one study, Blanchard and Wolfers (2000), suggests a moderate increase and one study, Scarpetta (1996), a substantial decrease in structural unemployment. Excluding Layard and Nickell (1999), the role of cyclical factors is coherent over the period: the models imply that positive shocks reduced unemployment by approximately two percentage points in Finland and one percentage point in Sweden.

[19] The results on the role of active policies are imprecise and in most cases depend on the inclusion of Sweden in the data set; see e.g., Layard and Nickell (1999), Blanchard and Wolfers (2000) and Daverini and Tabellini (2000).

[20] Layard and Nickell (1999) suggest the opposite for the late 1990s. Their results imply that unemployment should have been on a rise in both countries due to negative demand shocks, showing up as a fall in inflation.

[21] Furthermore, in many cases the confidence intervals of the estimates are wide and the results depend on the inclusion/exclusion of certain variables/ countries. This issue is well documented in Staiger et al. (1997).

The evidence for the early 2000s suggests that the unemployment rate declined by about 2 percentage points in Finland such that about 60 -70 percent of the decline stems from cyclical factors and the rest from structural factors. In Sweden, these estimates are of same magnitude. These predictions underestimate the observed evolution in unemployment in Finland, where the unemployment rate fell from about 16 percent in 1992-1994 to about 11 percent in 1995-1999 and then further to around 9 percent in 2000-2005. In Sweden, the corresponding fall was about 2 percentage points, from about 7 percent to about 5 percent in the late 1990s and then further to around 4 percent. To sum up, the ability of the reviewed panel data models to account for the observed fall in Finnish and Swedish unemployment is not more than satisfactory, although the predictions are clearly on the right side.

5. Summary

The two crises are alike in their initial timing, both beginning in 1991 and peaking in 1994. Finland's crisis was deeper in both absolute and relative terms for all the unemployment measures. The non-employment rate, that takes into account both the changes in the open unemployment rate and in the outflow from the labor force, provides an upper limit on the increase in total unemployment. The non-employment rate increased in Sweden by 10 percentage points whereas in Finland it rose by 15 percentage points. By this measure, the Finnish crisis was 50 percent worse than the Swedish crisis.

Sweden had a quick recovery until 1995, after which unemployment remained constant until 1998, whereas Finland was in a recovery process for the rest of the 1990s. After 1998, when unemployment also decreased in Sweden, the two countries differ in that the inflow into unemployment and duration continue to decrease in Finland, whereas the recovery from 1998 in Sweden was due solely to a sharp decrease in duration. One legacy of the crises shows up in the share of temporary employment that rose substantially in both countries in the 1990s.

The time series analyses indicate that there was a large shift in the structural unemployment rate in both Finland and Sweden. Our findings suggest that the structural unemployment doubled in both countries in the early 1990s. These findings accord with those of previous studies, which imply, on average, a rise of about 4-6 percentage points for Finland and 2-4 for

Sweden. Although empirical estimates of structural unemployment are likely to be uncertain when economies are subject to large shocks, as in Finland and Sweden in the early 1990s, the existing evidence implies that the crises of the 1990s in Sweden and Finland had long-lasting, if not permanent, effects on the labor market. Given the shelter afforded by various institutional arrangements, it comes as no surprise that adverse shocks (such as the rise in real interest rates) may have long-lasting effects on unemployment.

The estimates imply that structural unemployment remained roughly constant in both Finland and Sweden over the late 1990s. The impact of higher taxes was offset by lower replacement rates. For the early 2000s, the evidence suggests a modest decrease in structural unemployment, mainly due to lower rates of taxation, a lower replacement rate and diminishing union power in both countries. As a whole the results indicate that much of the decline in open unemployment in the late 1990s and early 2000s was due to positive demand shocks.

Overall the evidence on the factors explaining the evolution of unemployment remains vague. This applies both to our findings reported as well as to the evidence reported in previous studies. It appears that the rise in unemployment and its persistence at a high level was mainly due to aggregate demand shocks, several small effects stemming from changes in institutions combined with lagged adjustment (hysteresis). The hysteresis explanation, in particular, shows up in the estimates for the late 1990s: adjustment towards the unemployment levels of the late 1980s is slow in both countries in spite of increasing aggregate demand and enhanced incentives to accept job offers. Finland and Sweden are thus the prime candidates for the thesis put forward by Blanchard and Wolfers: a negative demand shock together with rigid institutions leads to long-lasting effects.

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Appendix 1. Means of variables used to generate predictions for the 1990s and early 2000s; institutions and shocks in Finland and Sweden

	Finland				*Sweden*			
	1985-1989	1990-1994	1995-1999	2000-2004	1985-1989	1990-1994	1995-1999	2000-2004
Institutions								
Tax wedge	70.0	72.0	84.0	77.0	90.0	77.0	90.0	83.0
Replacement rate	54.0	56.0	49.0	47.0	87.0	86.0	72.0	69.0
Benefit duration, Years	2.0	2.0	2.0	2.0	1.2	1.2	1.2	1.2
Employment protection, index	10	10	10	10	13	13	13	13
Union and employer co-ordination, index	5.5	5.5	5.5	6	6	6	6	6
Union contract coverage, index	3	3	3	3	3	3	3	3
Union density, as % of labor force	78.0	82.0	78.0	74.0	83.0	84.0	83.0	79.0
Active labour market spending as % of GDP	1.0	1.5	1.5	1.0	1.9	2.3	2.2	1.5
Active labour market spending as % of GDP/ unemployment	46	44	34	30	58	48	42	40
Owner-occupied dwellings, percent of total stock	74.0	70.0	66.0	63.0	55.0	57.0	54.0	59.0
Shocks								
Real interest, %, short-term, long term () and period peaks []	7.2 (5.8) [3.8]	5.8 (6.8) [5.9]	2.5 (4.6) [3.6]	1.2 (2.7) [2.6]	5.4 (6.1) [3.4]	4.2 (4.2) [6.2]	3.5 (5.2) [4.2]	1.4 (3.0) [2.5]
Labor demand shift, %	1.4	4.5	2.3	2.3*	3.1	5.2	5.6	5.6*
Total factor productivity, %	4.8	2.8	3.3	2.0	0.1	2.3	1.3	1.9
Annual inflation, %	4.7	3.3	1.0	1.6	5.5	5.6	0.8	1.5
Output gap, %	2.7	-6.3	-3.3	0.2	1.0	-4.1	-2.1	-0.1

Notes: The data source for the interest rate, inflation, output gap, tax wedge, total factor productivity, and active labour market spending is OECD (Economic Outlook, Taxing Wage Statistics, National Accounts and Total Economy Growth accounting database). Labor demand shift, co-ordination and coverage indices are taken from Blanchard and Wolfers (2000) for 1985-99 (htpp://web.mit.edu/ blanchard/www.articles.html). Updates for the period 2000-04 and estimates for union density, replacement rate, owner-occupied dwellings are gathered from different national sources.

Appendix 2.Parameter estimates of the panel data studies

	Institutions				
Study/					
	Benefit, level	Benefit, duration	Tax wedge	Active labour market spending	Employment protection
Elmeskov et al. (1998)	0.09	0	0.10	-0.11	0.33
Scarpetta (1996)	0.13	-	0	0	0
Layard and Nickell (1999)	0.013	0.10	0.027	-0.023	0
Blanchard and Wolfers (2000)	0.025	0.26	0.033	-0.028	0.095
	Institutions (cntd)				
	Union density	Union coverage	Wage co-ordination	Others (owner-occupation)	
Elmeskov et al. (1998)	0	0	-	-	
Scarpetta (1996)	0.12	0	0	-	
Layard and Nickell (1999)	0.010	0.38	-0.43	0.013	
Blanchard and Wolfers (2000)	0.033	0	-0.41	-	
	Shocks				
	Interest rate	Demand shift	Change in inflation	Productivity	Output gap
Elmeskov et al. (1998)	0	0	0	0	-0.51
Scarpetta (1996)	0.12	0	0	0	-0.52
Layard and Nickell (1999)	0	0	-0.21	0	0
Blanchard and Wolfers (2000)	0.47	0.19	0	-0.71	0

Notes: Sources: Scarpetta (1996) Table 1; Elmeskov et al (1998) Table 2, column 4; Blanchard and Wolfers (2000) Table 5, column 1; Layard and Nickell (1999) Table 15, column 1. In Layard and Nickell (1999) the dependent variable is in logs.

Appendix 3. Implied range of effects of shock in Finland and Sweden

	Coefficient	Range of independent variable: Finland – Sweden**	Effect of shock: Finland-Sweden***
Benefit level	0.025	0.56 – 0.86	1.01 - 1.02
Benefit duration	0.267	2.0 – 1.2	1.53 – 1.32
ALMP	0.028	1.62 – 2.51	1.04 - 1.07
Employment pro.	0.095	10.0 – 13.0	1.95 – 2.23
Tax wedge	0.035	0.67 – 0.88	1.02 – 1.03
Union coverage	-0.501 *	3.0 – 3.0	2.50 – 2.51
Union density	0.033	0.82 – 0.84	1.02 – 1.03
Co-ordination	0.414	5.5 – 6.0	3.21 – 3.51

Notes: * = not significant; ** = in 1990-94; *** calculated as 1+coefficient×value of independent variable; see Blanchard and Wolfers (2000), equation (1).

Table 1. The 1990s unemployment crises in a cross-country and times series perspective

	1990s peak			Next highest postwar peak		The Great Depression peak	
	year	Unemployment, %	rank in OECD	year	Unemployment, %	year	Unemployment, %
Finland	1994	16.7	3	1978	7.3	1932	8
Sweden	1993	8.2	19	1983	3.5	1933	23.3

Notes: The figures refer to official survey data of unemployment as a percentage of the total labor force.
The OECD rank is relative to the maximum levels observed during the 1990s for each OECD country.
The 1933 value for Sweden is the percentage unemployed in the trade unions.
Source: *OECD Economic Outlook* 1960-2000.

Table 2. Real wages and output : percentage change from through to peak in unemployment

	1990s: percentage changes			Next highest: percentage changes		
	Unemployment	GDP	Real labor cost	Unemployment	GDP	Real labor cost
Finland	13,5	-6,8	7,9	5,6	3	13,9
Sweden	6,8	-3,4	4,3	1,5	2,7	-3,6

Note: Dates for the peak in unemployment are given in table 2. The change in unemployment is the absolute percentage change.
Source: *OECD Economic Outlook* 1960-2000.

Table 3. Changes in unemployment between 2002 and 1986

		1986	2002	Absolute change	Relative change
Standardized unemployment, %	Finland	6,7	9,1	2,4	37
	Sweden	2,7	4,9	2,2	82
Non-employment rate, %	Finland	27,6	32,0	4,5	16
	Sweden	19,2	25,1	5,9	31
Participation ratio, %	Finland	76,5	74,8	-1,8	-2
	Sweden	83,0	78,0	-5,0	-6
Share of long-term unemployment (>12m), %	Finland	16,0	24,4	8,4	53
	Sweden	8,0	21,0	13,0	163
Inflow, %/week	Finland	0,4	0,3	0,0	-5
	Sweden	0,2	0,2	0,1	36
Duration incomplete spells, weeks	Finland	25,0	50,0	25,0	100
	Sweden	14,4	19,4	5,0	34

Table 4. Okun's law 1980-2004. Unemployment dependent variable

	Independent variable									
			u_{t-1}					*Structural rate*		
	c_{1980s}	c_{1990s}	1980s	1990s	Gap_t	*Adj.* R^2	*D.W.*	u_{st}^{1980s}	u_{st}^{1990s}	Δu_{st}
Finland	4.17	4.83	0.23	0.48	-0.40	0.98	1.59	5.4	9.3	3.9
p-value	0.00	0.51	0.17	0.16	0.00					0.000
Sweden	1.07	2.10	0.46	0.57	-0.31	0.96	1.06	2.0	4.9	2.9
p-value	0.04	0.12	0.03	0.59	0.00					0.000

Note: *p*-value for the 1990s dummy and slope effects refer to the extra effect. The *p*-value of the difference in the structural rate refers to a Wald test of the null hypotheses of no difference between the 1980s and 1990s: $H_0 = \frac{\alpha_0 + \alpha_1}{1-\alpha_2-\alpha_3} = \frac{\alpha_0}{1-\alpha_2}$

Table 5. The Beveridge curve 1980-2004. Ln(unemployment) dependent variable

	Independent variable									
			$\ln u_{t-1}$					*Structural rate*		
	c_{1980s}	c_{1990s}	1980s	1990s	$\ln v_t$	*Adj.* R^2	*D.W.*	u_{st}^{1980s}	u_{st}^{1990s}	Δu_{st}
Finland	1.53	1.33	-0.15	0.33	-0.47	0.98	2.34	4.6	10.4	5.8
p-value	0.00	0.51	0.27	0.01	0.00					0.013
Sweden	0.28	0.48	0.55	0.53	-0.47	0.98	1.67	3.0	4.2	1.2
p-value	0.00	0.19	0.00	0.81	0.00					0.006

Note: *p*-value for the 1990s dummy and slope effects refer to the extra effect. The *p*-value of the difference in the structural rate refers to a Wald test of the null hypotheses of no difference between the 1980s and 1990s: $H_0 = \frac{\alpha_0 + \alpha_1}{1-\alpha_2-\alpha_3} = \frac{\alpha_0}{1-\alpha_2}$

Table 6. Summary: estimated structural unemployment rates.

	Finland			*Sweden*		
Method	u^*_{1980s}	u^*_{1990s}	Δu^*	u^*_{1980s}	u^*_{1990s}	Δu^*
Okun's law	5.4	9.3	**3.9**	2.0	4.9	**2.9**
Beveridge	4.6	10.4	**5.8**	3.0	4.2	**1.2**
Phillips curve	3.9	10.6	**6.7**	2.1	5.8	**3.7**

Note: The first three rows summarize the specifications in tables 1, 2 and 3, which allow one break in the structural rate. The Phillips curve approach is taken from Turner et al (2001), which allows a continuously changing structural rate (NAIRU) through Kalman filtering. The 1980s value is taken as the 1985 value and the 1990s value as the 1995 value.

Table 7. Summary indicators of the strictness of employment protection legislation (EPL)

	Regular employment		Temporary employment		Collective dismissal	Overall EPL-strictness, (ver. 1)	
	Late 1980s	Late 1990s/ 2003	Late 1980s	Late 1990s/ 2003	Late 1990s/2003	Late 1980s	Late 1990s/2003
Finland	2.8	2.3 / 2.2	1.9	1.9/ 1.9	2.4/2.6	2.3 (9)	2.1 (12)/2.0 (13)
Sweden	2.9	2.9 / 2.9	4.1	1.6 / 1.6	4.5/4.5	3.5 (15)	2.2 ((16)/2.2 (15)

Source: *OECD Employment Outlook* 2004, Table 2.A2.4.

Note: Numbers in parenthesis are country ranks with 1 being the most flexible country and 26 the least. Regular employment is a summary index measure, taking values between 0 and 6, based on: procedural inconvenience, notice and severance pay for no-fault dismissals, and difficulty of dismissal. The temporary employment index is based on measures of strictness on fixed-term contracts and temporary work agencies. The collective dismissal index is based on: definition of collective dismissal, additional notification requirements, additional delays involved and other special costs to employers.

Table 8. Structural unemployment in Finland and Sweden; evidence from panel data studies

Study: Periods	1990s u*				Δu*			
	Finland	Sweden	OECD-Europe	US	Finland	Sweden	OECD-Europe	US
Scarpetta (1996): 1971-83/1991	5.7	3.1	7.1	6.7	**11.0**	**3.7**	3.6	1.1
Elmeskov et al.: (1998) 1983-85/1990-93	n.a.	n.a.	n.a.	n.a.	**10.2**	**4.3**	1.0	-1.6
Layard and Nickell (1997): 1991-95	9.0	2.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Blanchard and Wolfers (2000): 1980-85/1995-96	16. 0	4.5	n.a.	5.4	**11.0**	**2.5**	n.a.	-1.0

Notes: The estimates are taken from the following Tables: Scarpetta (1996), Table 6; Elmeskov et al (1998), Table 3a. The estimates of Layard and Nickell (1999) are derived using the parameter estimates reported in Table 15 (column 1) and the country means of the explanatory variables. The estimates of Blanchard and Wolfers (2000) are based on their equilibrium unemployment rate equation reported in Table 5 (column 3). The data is available at htpp:// web.mit.edu/ blanchard/www.articles.html. OECD-Europe consists of 17 OECD countries.

Table 9. Structural unemployment (percent) in the mid 1990s in Finland; time series evidence

Study: periods	Model	Data	Estimate of u* in mid 1990s	Δu* between periods
Honkapohja and Koskela (1999):1986-89/ 1994-96	Wage, price, trade balance and Okun equations	Aggregate, 1970-94	11.9	5.8
Holm and Somervuori (1997): 1978-90/1991-94	Wage and price equations; Nawru estimates	Manufacturing, 1975-1994	12.0	8.0
Kiander and Pehkonen (1999): 1908-1988/ 1989-94	Wage and price equations	Aggregate, 1980-1994	7.0-8.0	5.0-6.0
Rasi and Viikari (1998): 1982-90/ 1991-1997	Structural time series	Aggregate, 1976.1 – 1996.4	8.0-10.0	2.0-4.0
OECD (2000): 1980-90/1995	Structural time series	Aggregate, 1976.1 – 1999.4	10.6	5.0-6.7

Notes: OECDs Figures are from Table V.I. See also Richardson et al (2000) for further details.

Table 10. Structural unemployment (percent) in the mid 1990s in Sweden; time series evidence

Study: periods	Model	Data	Estimate of u* in mid 1990s	Δu* between periods
Apel and Jansson (1999): 1980-90/ 1990-96	Structural time series/unobserved component	Aggregate, 1970.1-1996.3	3.0-6.0	0.0-3.0
Forslund (1995): 1990/ 1993	Wage, price, trade balance and Okun equations	Aggregate, 1960-93	4.3-7.3	1.3-4.3
OECD (2000): 1980-90/ 1995	Structural time series	Aggregate, 1976.1 – 1999.4	5.8	2.0-3.7
Hjelm (2003): 1985-89/ 1995-99	Structural time series (SVAR)	1955-2004	3.9-4.8	2.9-4.0

Notes: see Table 9.

Table 11. Contribution of different factors to the change in unemployment in the early 1990s in Finland and Sweden; percentage points between 1985-89 and 1990-94

	1	2	3	4	5		
Study	Taxes	Benefits	Unions	ALMPs	Others	Sum: 1-5	Shocks
Scarpetta (1996)	0	0.3/ 0.1	0.5/ 0.1	0 / 0	2.0 / 0.1	2.8 / 0.3	4.9/ 2.9
Elmeskov et al. (1998)	0.2/-1.3	0.2/ 0.1	0.9/0	0.2/ 1.1	3.6/ 0.8	5.0/ 0.7	4.6/ 2.6
Layard and Nickell (1999)	0.3/-0.9	0.2/ 0	0.2/ 0	0.3/ 0.6	0.3/ 0.1	1.2/ -0.2	2.9/ -0.1
Blanchard and Wolfers (2000)	0.1/-0.4	0.1/ 0	0.1/ 0	0.1/ 0.3	0/ 0	0.4/ -0.1	3.0/ 0.1

Notes: - = not considered in the study; 0 = considered, but an insignificant effect/ no change in explanatory variable. In Layard and Nickell (1999), the dependent variable is lnU. We evaluate the effects at u = 5 percent (2.5 percent) which is the average unemployment rate of the 1980s in Finland (Sweden). Shocks are as follows: Scarpetta (1996), interest rate (0.3/0.3) and output gap (4.6/2.6); in Elmeskov (1998), output gap (4.6/2.6); in Layard and Nickell (1999), change in inflation (2.9/0); in Blanchard and Wolfers (2000) interest rate (1.0/1.3), productivity (1.4/-1.6) and labour demand shift (0.6/0.4). "Others" include country-specific effects plus all other impacts by unreported factors.

Table 12. Contribution of different factors to the change in unemployment in the late 1990s and early 2000s in Finland and Sweden; percentage points between 1990-94 and 1995-99

	1	2	3	4	5		
Study	Taxes	Benefits	Unions	ALMPs	Others	Sum:1–5	Shocks
Scarpetta (1996)	0/ 0	-0.9/-1.8	-0.5 /0	0 /0	-	-1.4/-1.8	-1.9/-1.2
Elmeskov et al. (1998)	1.2/1.3	-0.6/-1.3	0 /-0.1	1.1/ 0.7	-	2.7/ 0.6	-1.6/ -1.0
Layard and Nickell (1999)	3.2/1.7	-0.9/-0.9	-0.4 /-0.1	2.3/ 0.7	-0.5/-0.2	3.8/1.2	4.8/ 2.5
Blanchard and Wolfers (2000)	0.4/0.4	-0.2/-0.4	-0.1/ 0	0.3/ 0.2	0/ 0	0.4/ 0.2	-1.7/ -0.2

Notes: In Layard and Nickell (1999), we evaluate the effects at u = 10 percent (5 percent) in Finland (Sweden). In Blanchard and Wolfers (2000), shocks consist of interest rate (-1.0/-1.0), demand shift (-0.4/0.1) and productivity (-0.3/0.7). In Scarpetta (1996) shocks consist of change in interest rate (-0.3/-0.2) and output gap (-1.6/-1.0). In Elmeskov (1998), shock is output gap (-1.6/-1.0) and in Layard and Nickell (1999) change in inflation (4.8/2.5).

Table 13. Contribution of different factors to the change in unemployment in the late 1990s and early 2000s in Finland and Sweden; percentage points 1995-99 and 2000-04

	1	2	3	4	5		
Study	Taxes	Benefits	Unions	ALMPs	Others	Sum:1–5	Shocks
Scarpetta (1996)	0/0	-0.2/-0.4	-0.5/0	0 /0	-	-0.7/-0.4	-1.9/-1.2
Elmeskov et al. (1998)	-0.7/-0.7	-0.3/-0.3	0/-0.5	0.4/0.2	-	-0.6/-1.3	-1.7/-1.2
Layard and Nickell (1999)	-1.9/-0.9	-0.3/-0.2	-0.4/-0.2	0.9/0.2	-0.4/0.3	-2.1/-0.8	-1.2/ -0.7
Blanchard and Wolfers (2000)	-0.2/-0.2	0/-0.1	-0.2/-0.1	0.1/0.1	0/0	-0.3/-0.3	0.4/-1.2

Notes: In Layard and Nickell (1999), we evaluate the effects at u = 10 percent (5 percent) in Finland (Sweden). In Blanchard and Wolfers (2000), shocks consist of interest rate (-0.5/-0.8), demand shift (0/0) and productivity (0.9/-0.4). In Scarpetta (1996) shocks consist of a change in the interest rate (-0.1/-0.2) and the output gap (-1.8/-1.0). In Elmeskov, the shock is the output gap (-1.8/-1.1) and in Layard and Nickell (1999) the change in inflation (-1.2/-0.7).

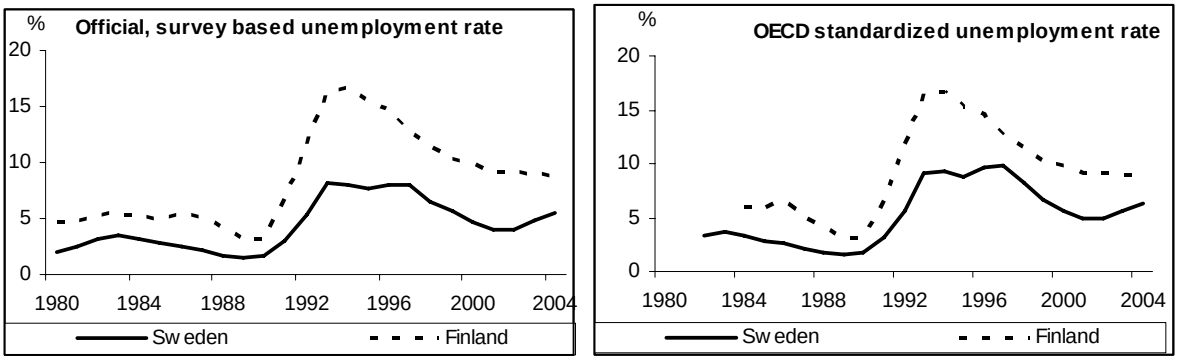

Figure 1. Official and standardized (OECD) unemployment rates in Finland and Sweden 1980-2004.

Source: *OECD Economic Outlook.*

Figure 2. Participation rate 1980-2004

Source: *OECD Economic Outlook*

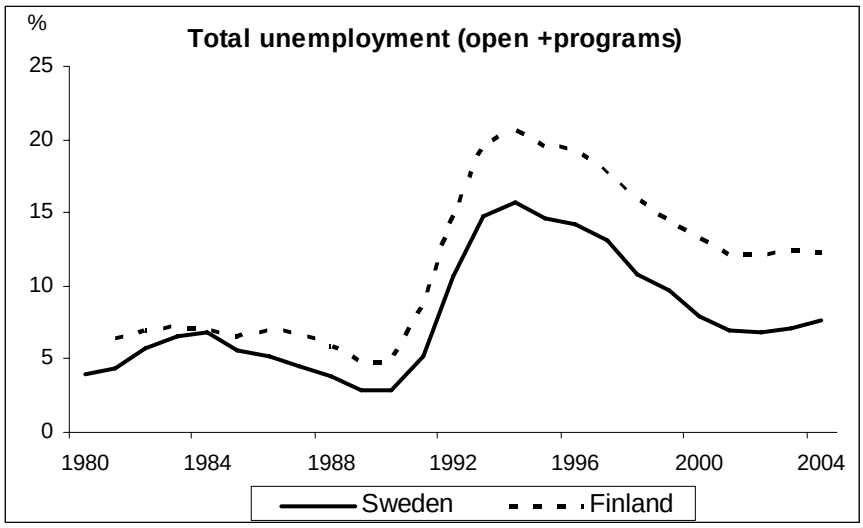

Figure 3. Total unemployment in Finland and Sweden, 1980-2004

Source: Finland: Työpoliittinen aikakauskirja (*Finnish Labour Review*), Ministry of Labour, Sweden: Arbetskraftsundersökningarna (*Labour Force Survey*), Statistics Sweden, SCB and Arbetsmarknadsverket (*Swedish National Labour Market Administration*), www.amv.scb.se (historisk statistik).

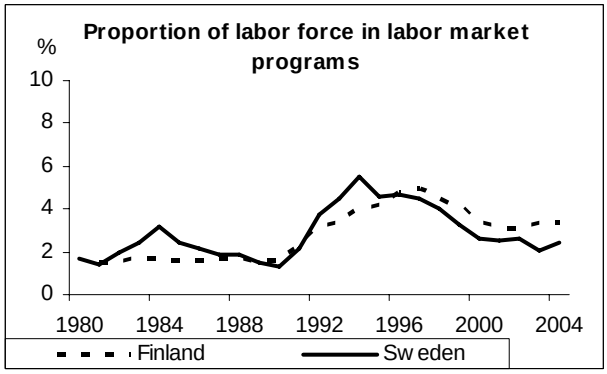

Figure 4. Labor market programs in Finland and Sweden, 1980-2004

Source: Finland: Työpoliittinen aikakauskirja (*Finnish Labour Review*), Ministry of Labour, Sweden: Arbetskraftsundersökningarna (*Labour Force Survey*), Statistics Sweden, SCB and Arbetsmarknadsverket (*Swedish National Labour Market Administration*), www.amv.scb.se (historisk statistik).

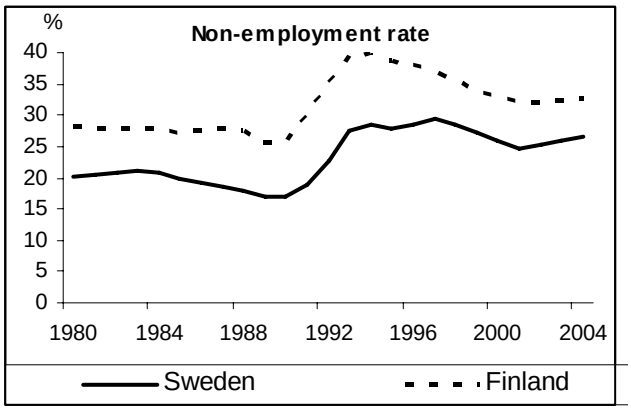

Figure 5. The non-employment rate in Finland and Sweden 1980-2004

Source: Finland: Työpoliittinen aikakauskirja (*Finnish Labour Review*), Ministry of Labour, Sweden: Arbetskraftsundersökningarna (*Labour Force Survey*), Statistics Sweden, SCB.

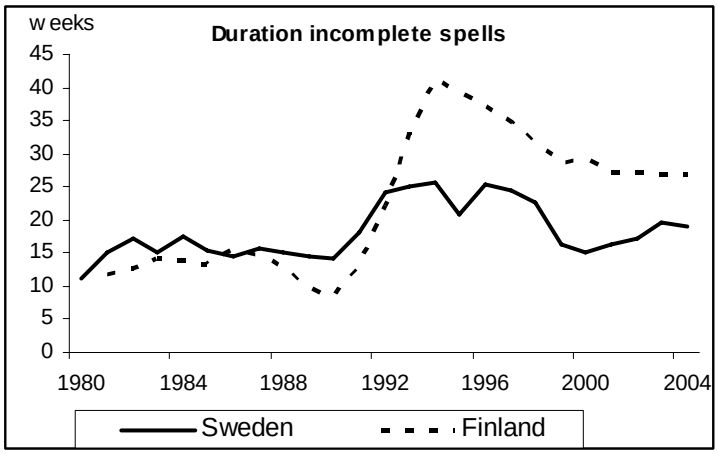

Figure 6. Duration of incomplete spells of unemployment in Finland and Sweden 1980-2004

Source: Finland: Työpoliittinen aikakauskirja (*Finnish Labour Review*), Ministry of Labour, Sweden: Arbetskraftsundersökningarna (*Labour Force Survey*), Statistics Sweden, SCB.

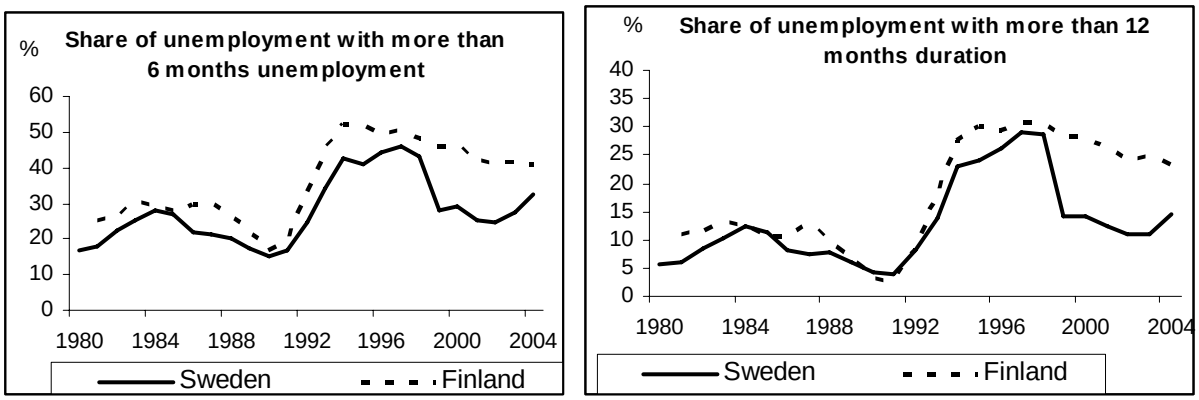

Figure 7. Share of long-term unemployment in total unemployment in Finland and Sweden 1980-2004

Source: Finland: Työpoliittinen aikakauskirja (*Finnish Labour Review*), Ministry of Labour, Sweden: Arbetskraftsundersökningarna (*Labour Force Survey*), Statistics Sweden, SCB.

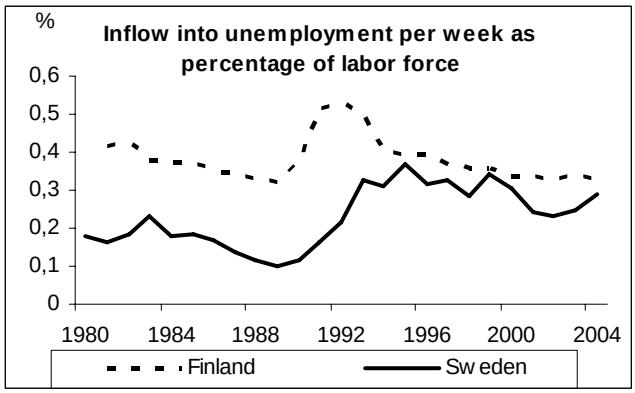

Figure 8. Inflow rates in Finland and Sweden 1980-2004

Source: Finland: Työpoliittinen aikakauskirja (*Finnish Labour Review*), Ministry of Labour, Sweden: Arbetskraftsundersökningarna (*Labour Force Survey*), Statistics Sweden, SCB.

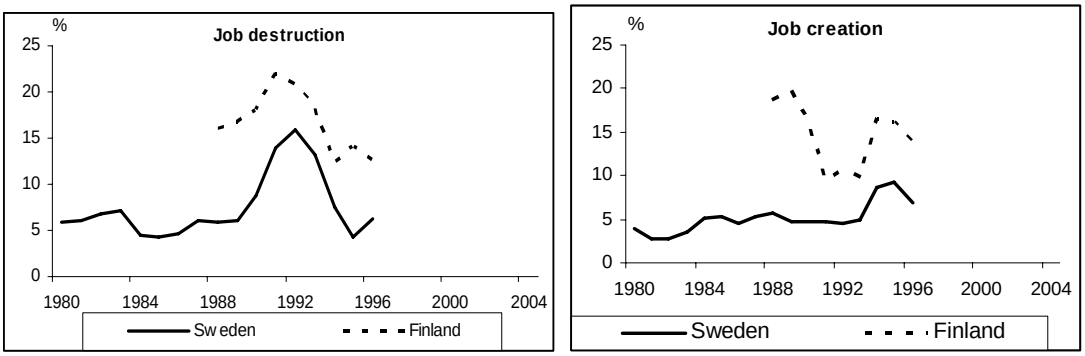

Figure 9. Job creation and destruction in Finland and Sweden 1980-1996

Source: Finland: Böckerman and Maliranta, (2001); Sweden: Anderson (1999).

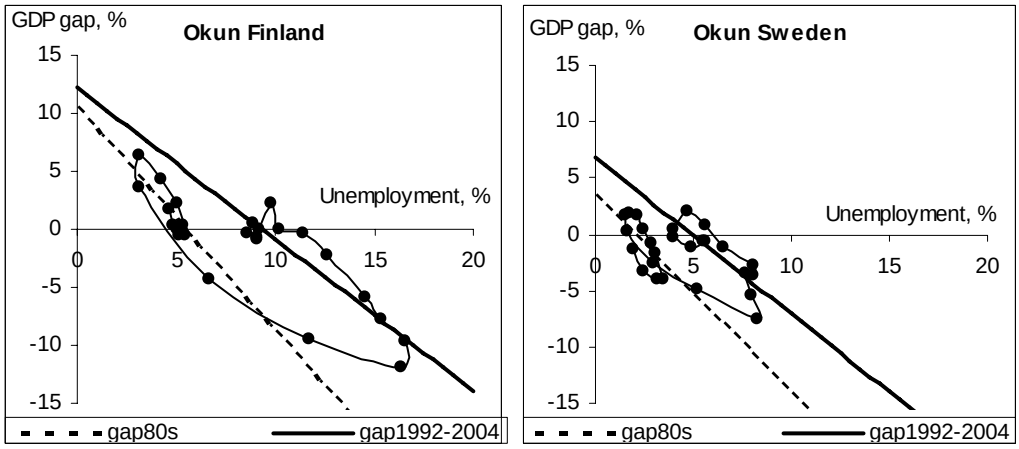

Figure 10. Okun relations in Finland and Sweden 1980-1991 and 1992-2004 (solid line)

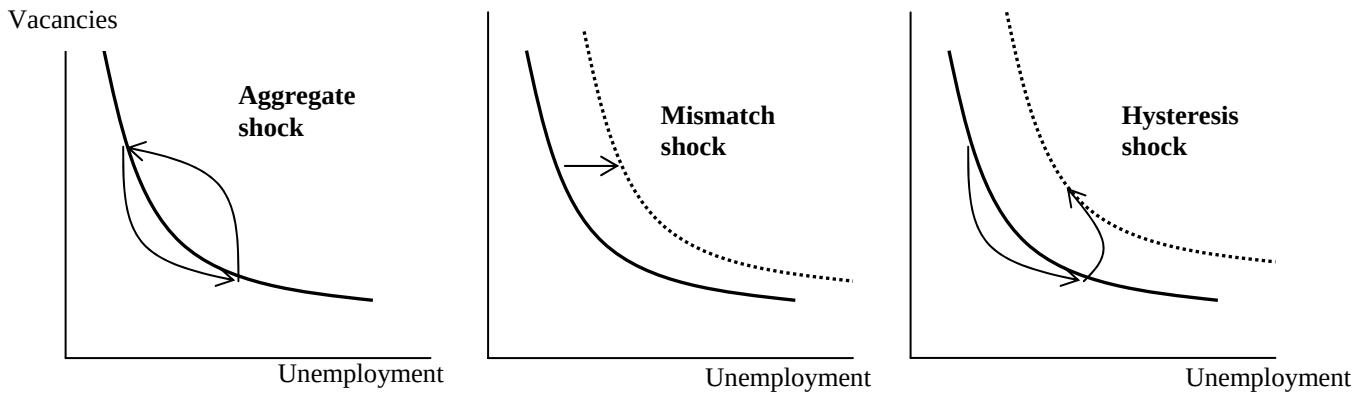

Figure 11. Three types of shocks and adjustment in the Beveridge space

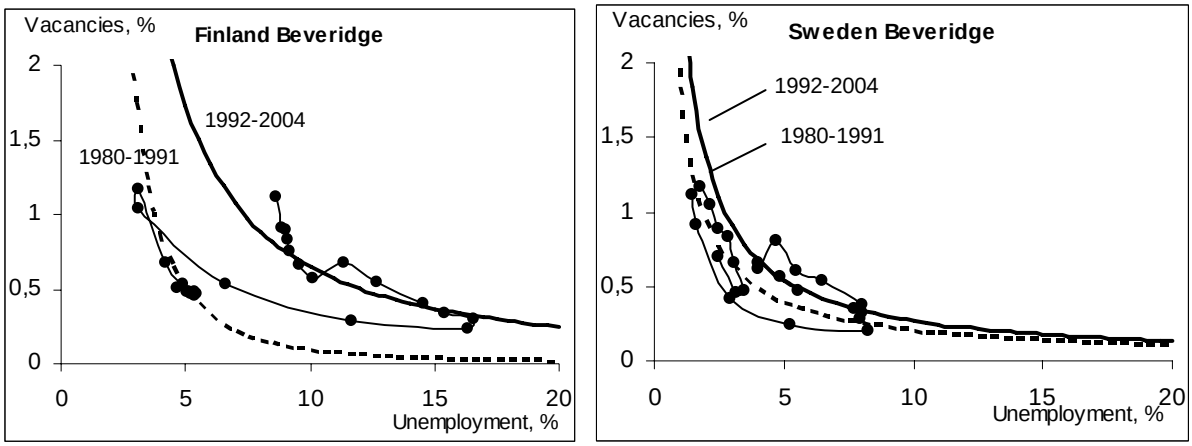

Figure 12. Beveridge curves in Finland and Sweden 1980-1991 and 1992-2004.

Note: Vacancies and unemployment are measured relative to the labor force.

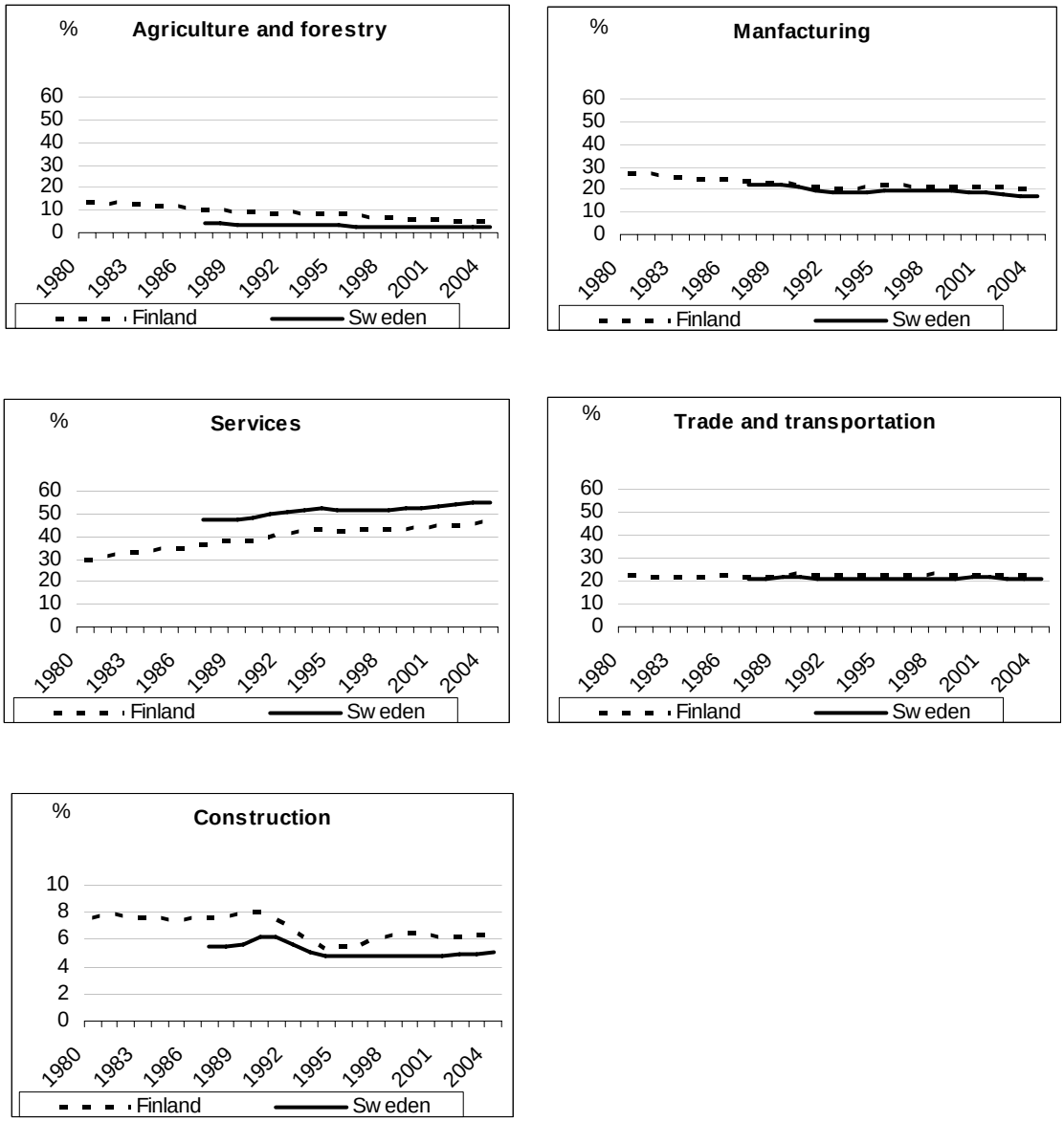

Figure 13. Sectoral employment shares in Finland and Sweden 1980-2004

Source: Finland: Työpoliittinen aikakauskirja (*Finnish Labour Review*), Ministry of Labour, Sweden: Arbetskraftsundersökningarna (*Labour Force Survey*), Statistics Sweden, SCB.

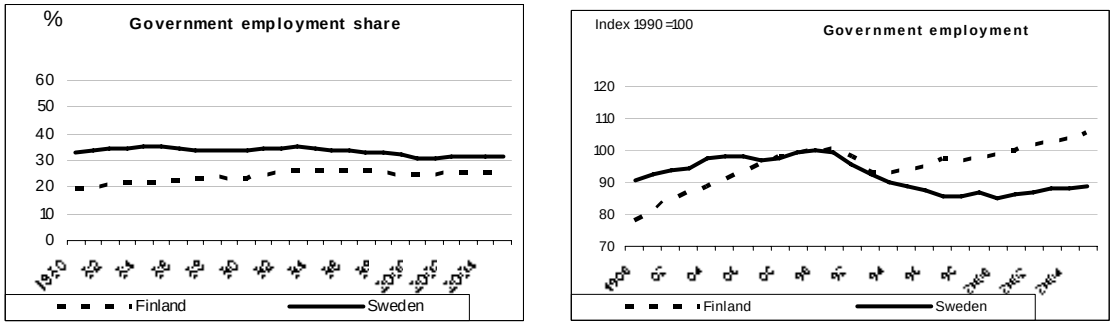

Figure 14. Government (local and state) employment: absolute levels and shares in Finland and Sweden 1980-2004.

Source: *OECD Economic Outlook.*

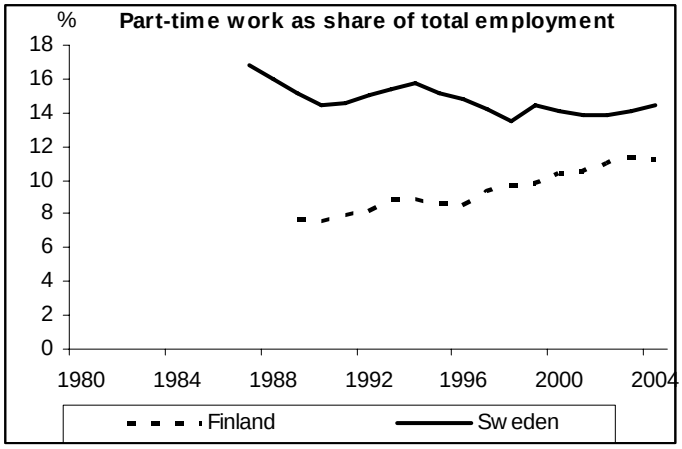

Figure 15. Part-time work (<29 hours) as share of total employment in Finland and Sweden 1982-2004

Source: Finland: Työpoliittinen aikakauskirja (*Finnish Labour Review*), Ministry of Labour, Sweden: Arbetskraftsundersökningarna (*Labour Force Survey*), Statistics Sweden, SCB.

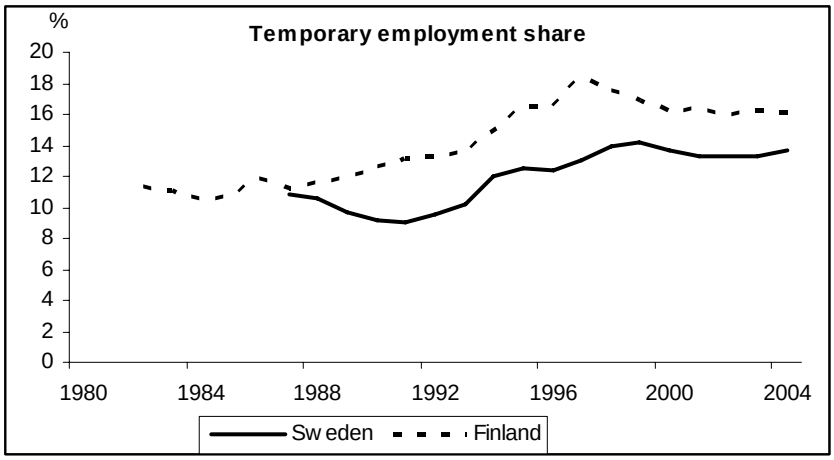

Figure 16. Temporary employment as share of total employment in Finland and Sweden 1982-2004

Source: Finland: *Työpoliittinen aikakauskirja* (*Finnish Labour Review*), Ministry of Labour, Sweden: *Arbetskraftsundersökningarna* (*Labour Force Survey*), Statistics Sweden, SCB.

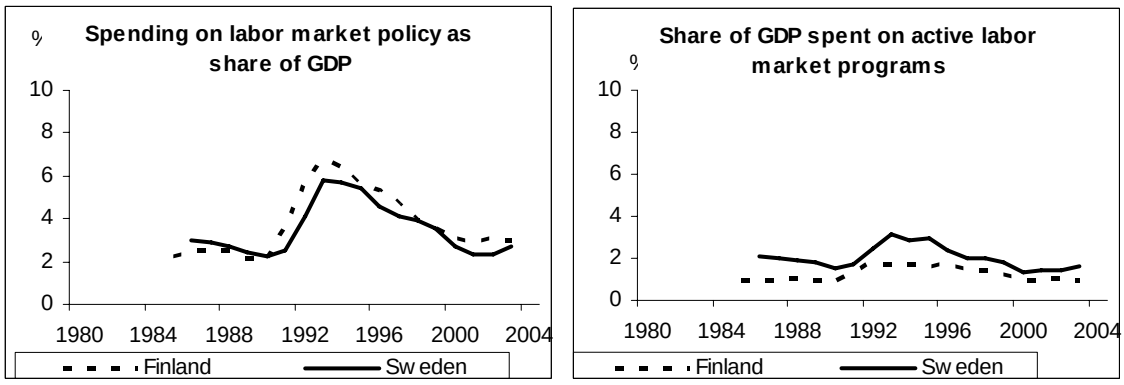

Figure 17. Spending on total and active labor market policies in Finland and Sweden 1991-2004.

Source: *OECD Employment Outlook.*

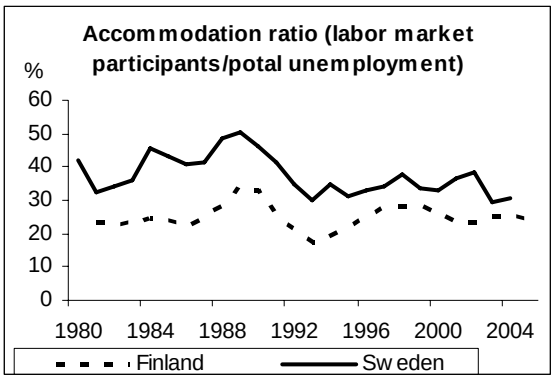

Figure 18. Cyclically adjusted active labor market policy in Finland and Sweden 1980-2004.

Source: *OECD Employment Outlook.*

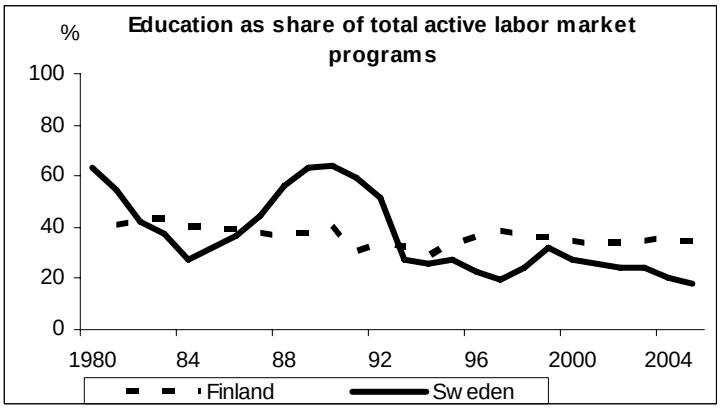

Figure 19. Education share of active labor market policy in Finland and Sweden 1980-2004.

Source: Finland: Työpoliittinen aikakauskirja (*Finnish Labour Review*), Ministry of Labour, Sweden: Arbetsmarknadsverket (*Swedish National Labour Market Administration*), www.amv.scb.se (historisk statistik), numbers after 2000 include "*förberedande utbildning*" (preparatory education).

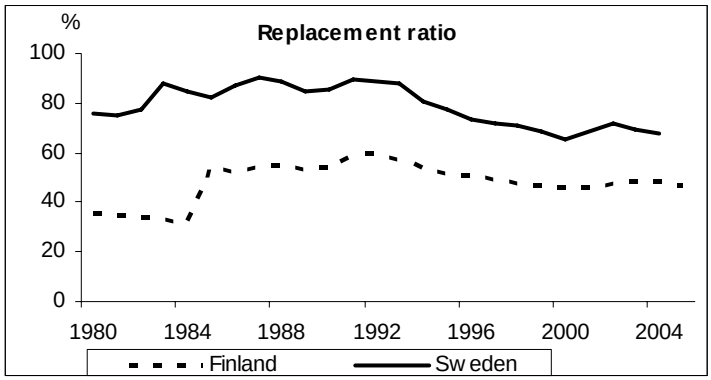

Figure 20. Replacement rates in Finland and Sweden 1980-2004.

Note: The replacement rate is the average for Finland and the maximum for Sweden.

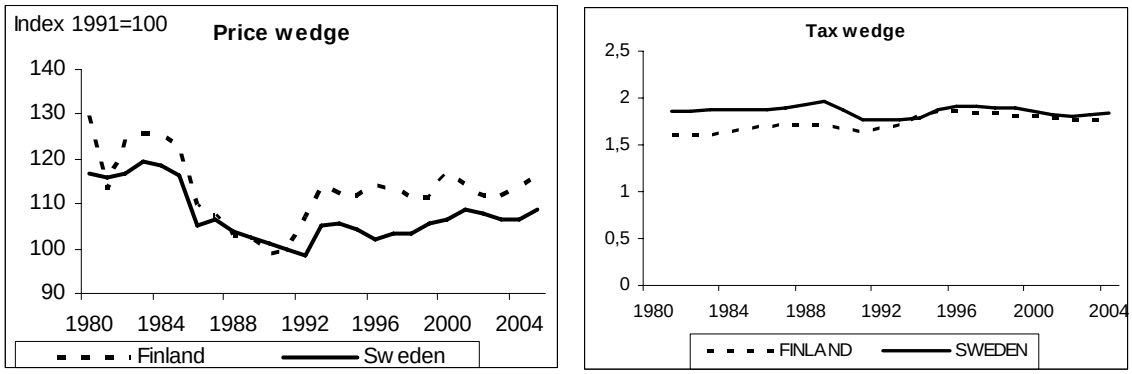

Figure 21. The tax and price wedge in Finland and Sweden 1980-2004.

Note: The tax wedge is the ratio between the employer wage cost and the take-home pay minus value added taxes for the employee. It is defined as (1+ payroll tax rate)*(1+value added tax)/(1-average income tax rate). The price wedge is defined as the ratio between an import price index and a producer price index.
Source: Tax wedge: *OECD Taxing wages* (average income and payroll tax rates for couples, biannual), *OECD Revenues* (VAT revenues), and *OECD Economic Outlook* (household consumption). Price wedge: *IMF International Financial Statistics*.