Macroeconomic developments in the Nordic countries

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Introduction: "Snapshots" of the present situation

"At the beginning of 1997, the prospects for the Danish economy are in several respects the most favourable for some time … the economic upswing is gaining momentum, in a historical perspective wage and price increases are moderate, the current account is in surplus and the government budget can be expected to be balanced in 1997."

Danmarks Nationalbank *Annual Report,* 1997.

"… estimates for growth in domestic demand and employment for 1997 have once again been adjusted upwards, primarily reflecting three factors: … the government budget for 1997 resulted in a slightly more expansionary fiscal policy; … petroleum investment appears to be higher …; and private consumption is stronger than projected … due to *… the sharp fall in interest rates in conjunction with marked wage growth."*

Norges Bank *Economic Bulletin*, 1997, 1.

"Die isländische Wirtschaft steht in voller Blüte; als treibende Kraft wirkt der private Konsum, ein Umstand, welcher dem Finanzminister des Landes Sorgen bereite … Die Tugend des Sparens sei in der Tradition des Landes weniger verankert als anderswo … auf jene Verbesserung der wirtschaftlichen Bedingungen reagieren die Isländer umgehend mit einer Steigerung ihrer private Ausgaben"

Neue Zürcher Zeitung, end-July 1996.

"Unemployment is Finland's greatest problem. The failure to reach the goal of halving unemployment (by 1999) is symptomatic of the poor functioning of

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the labour market and slow growth in demand … Significant reasons for the mass unemployment are still the high taxation and insufficient wage flexibility."

The Research Institute of the Finnish Economy (ETLA) *The Finnish Economy*, 4/1996.

"Since the beginning of 1996, the total unemployment rate has moved up … the level of about 12% is 0.7 percentage points high than a year earlier … The rise in unit labour costs has accelerated during the first three quarters of 1996. This mainly reflects the higher increase in wage costs but it also has to do with weaker productivity growth".

Sveriges Riksbank *Inflation Report,* December 1996.

Contrary to the common notion of the Nordic countries as forming a homogenous group, these "snapshots" of the present conjuncture suggest a highly diverse picture. The diversity does not only reflect cyclical influences and the current stance of policies but can also be attributed to underlying factors, including the heritage of macroeconomic imbalances and the timing and nature of the corrective measures taken.

This paper attempts to identify these underlying factors and how they have affected economic developments in the 1990s. In doing so, it covers a rather broad range of issues, including differences in the initial conditions as well as the shocks to which the Nordic economies were exposed as this decade unfolded. The bulk of the paper (Sections 3 and 4) is focused on developments in labour markets where the changes since the 1980s have been most dramatic. This discussion is preceded by a brief account of recent macroeconomic developments (Section 1) and of the initial conditions at the start of this decade (Section 2). The last Section offers a few concluding observations.

1. Recent macroeconomic trends

The output and employment performance of the Nordic countries has diverged significantly since 1992 (Tables 1 and 2). While during the previous 10 years the range of output growth was only 1.9–2.6%, it has widened to 1.0–3.8% since 1992 and there is a clear "split" between Denmark and Norway, on the one hand, and Sweden and Finland, on the other, with Iceland occupying an intermediate position. This split is even

Table 1

Basic indicators

Latest available figures

Countries	Per capita GDP[1]	Employment by sector[2]			Foreign trade[3]	Gross saving[4]	Broad money/ GDP[5]	
		Primary	Industry	Services			1981	1992
Denmark . . .	21,530	5.1	26.8	68.1	27.5	17.6	35.9	43.7
Norway . . .	22,670	5.2	23.4	71.5	27.5	21.9	53.1	69.8
Iceland	21,940	9.4	26.1	65.2	25.2	15.8	28.0	38.7
Finland	17,785	7.1	27.6	65.3	28.7	19.8	41.8	57.5
Sweden	18,675	2.9	26.0	70.9	30.2	16.6	60.0	47.4
Memo:								
*United States .	26,435*	*2.8*	*23.9*	*73.3*	*9.5*	*15.9*	*72.1*	*67.4*
*Germany . . .	20,500*	*3.3*	*37.6*	*59.1*	*20.8*	*21.3*	*49.5*	*54.0*

[1] In current (US dollar) prices and PPPs. [2] As a percentage of total employment. [3] Average of exports and imports as a percentage of GDP. [4] Gross national saving as a percentage of GDP. [5] In percentages.

Sources: OECD *Main Economic Indicators,* OECD *Labour Force Statistics,* IMF *International Financial Statistics* and national data.

Table 2

Developments in output, employment and unemployment

Average annual rates, in percentages

Countries	1981–91		1992–96		1981		1992		1996	
	GDP	Emp	GDP	Emp	Gap	Un	Gap	Un	Gap	Un
Denmark . . .	2.0	0.3	2.1	0.1	−3.1	9.2	−3.5	11.2	−0.9	8.8
Norway . . .	2.6	0.4	3.8	1.1	0.9	2.0	−4.4	5.9	0.6	4.9
Iceland	2.6	1.5	1.6	0.3	5.5	0.4	−3.0	3.0	−1.0	4.3
Finland	2.2	0.1	1.5	−2.2	0.1	4.9	−7.8	13.1	−2.3	16.3
Sweden . . .	1.7	0.4	0.8	−2.0	−1.1	2.5	−1.0	5.3	−1.2	8.0
Memo:										
*United States .	2.4*	*1.5*	*2.6*	*1.5*	*−1.1*	*7.6*	*−0.9*	*7.5*	*−0.3*	*5.4*
*Germany . . .	2.3**	*0.5**	*1.5*	*−1.1*	*−0.4*	*4.5*	*2.7*	*7.7*	*−1.4*	*10.3*

Notes: GDP: percentage change of GDP in constant prices; Emp: percentage change of total employment; Gap: ratio of actual to potential GDP, in percentages (a positive sign = excess demand); and Un: unemployment as a percentage of the labour force.

* 1981–90, western Germany only.

Sources: OECD *Economic Outlook*, June 1997 and author's estimates.

more pronounced for labour market developments. Denmark and Norway experienced rising unemployment in the 1980s but during this decade unemployment has fallen, in the latter mainly due to rapid demand growth and in the former as the result of various labour market measures which reduced participation rates as well. Finland, Iceland and Sweden also saw rising unemployment during the 1980s. However, in contrast to developments in Norway and Denmark, unemployment has continued rising, even though the output gaps have been reduced in Finland and Iceland.

2. Sources of divergence

How can these divergences and, in particular, the marked slowdowns in Finland, Sweden and Iceland after 1992 be explained? Were they caused by nominal shocks related to changes in monetary policy or were real shocks the main "culprit"? From the companion paper on monetary policy in the Nordic countries it is evident that there have been major differences in the stance of monetary policies, and the targets and strategies of monetary policy were also changed after 1992. On the other hand, according to Holden (1996) domestic nominal shocks have not been particularly important in the Nordic countries; instead, he attributes fluctuations in the real economy and, in particular, in labour markets to real shocks, allied with insufficient self-regulating mechanisms. The fact that the Nordic countries are small and open economies would also point to real shocks as the main driving force. However, since most of them attempt to stabilise nominal exchange rates and have removed restrictions on capital flows, external nominal shocks may also have played a role.

In the following I attempt to find some preliminary answers to these questions. I start with nominal shocks and monetary policy and then turn to external shocks. Section 3 analyses labour market developments and the extent to which the observed changes can be attributed to cyclical or structural forces.

2.1 Nominal shocks and monetary policy

Developments in aggregate demand, as measured by the output gaps, can, in part, be related to changes in monetary conditions, although in no case

is the relationship very close (Graphs 1a–1c). For instance, real short and long-term interest rates have been positive in Iceland this decade and the change from negative to positive real interest rates was accompanied by a marked slowdown in the rate of growth of real money supply and a widening of the output gap. Similarly, in Finland, higher real interest rates can be associated with slower monetary growth and a wider output gap while for the other countries, the influence of changes in monetary policy is more difficult to identify. In the case of Denmark, changes in real money does have a significant effect on output developments, but neither real interest rates nor the growth of monetary aggregates this decade have been significantly different from developments in earlier periods. In Norway, too, monetary conditions have been relatively stable, whereas, in Sweden, real interest rates increased substantially after 1992, but the real effect of this move seems to have been modest.

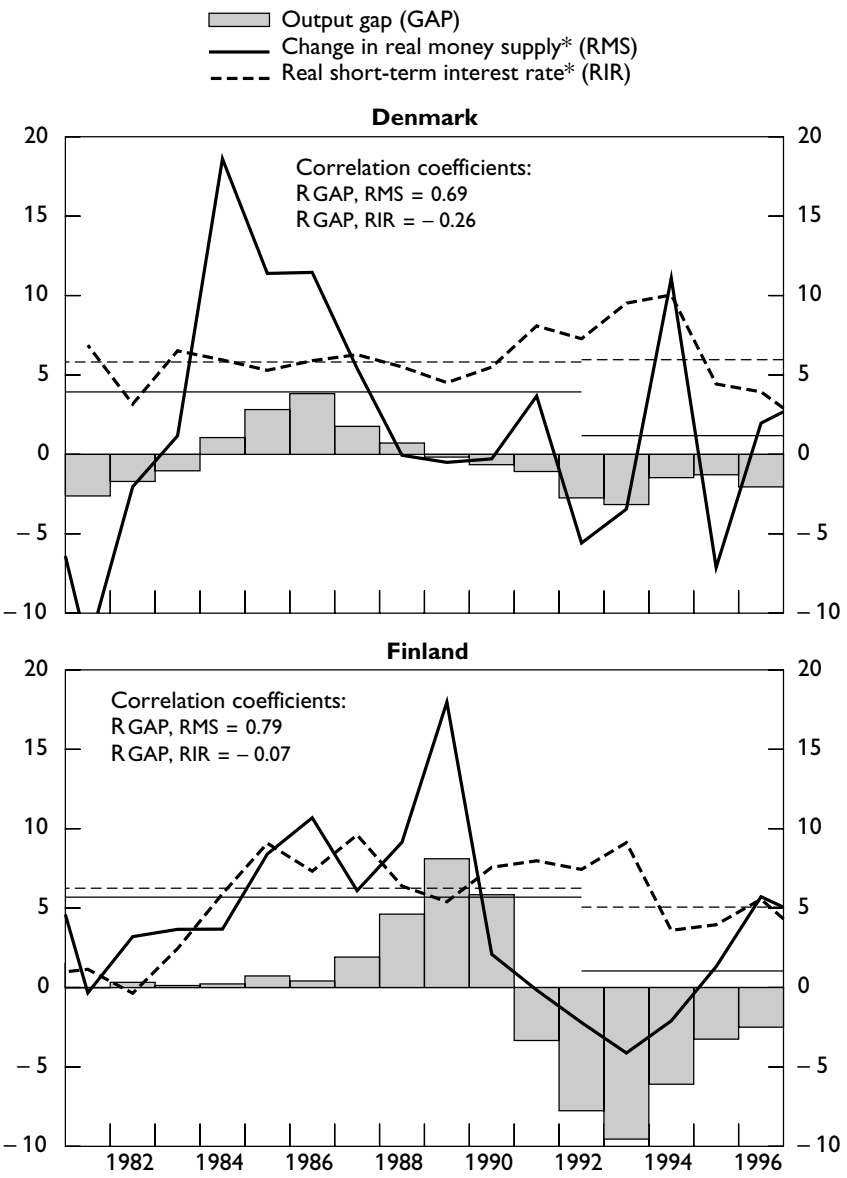
However, changes in real interest rates and in the growth of monetary aggregates by no means exhaust the potential influence of financial variables. In fact, one of the most striking development in the Nordic countries has been the large swings in household saving which, in turn, can be related to deregulation of financial markets and asset price cycles (Graph 2 and Table 3).[1] In Finland, Norway and Sweden, household saving was negative in the second half of the 1980s as households incurred large debts against the backdrop of booming asset prices and the removal of credit and interest rate restrictions. Subsequently, as interest rates were raised to "brake" the excessive demand growth and asset prices collapsed, households started to reduce their debts. As a result, in all three countries, though most notably in Sweden, sluggish consumption growth has, until recently, been a main reason for the slow growth of GDP.

In Denmark, the deregulation of financial markets was much more gradual and the asset price cycle less pronounced than in Finland, Norway and Sweden. Nonetheless, Denmark, too, has seen a marked increase in household saving until 1995–96, when rising house prices and more favourable conditions for financing or refinancing mortgage debts led to stronger consumption growth. In Iceland, household saving seems to have been influenced by the removal of credit constraints as well as by changes in inflation and in anti-inflationary policies. Household saving fell to an all

[1] These developments as well as other initial imbalances are also discussed as background to the setting of monetary policies in the companion paper on monetary policy.

Graph 1a

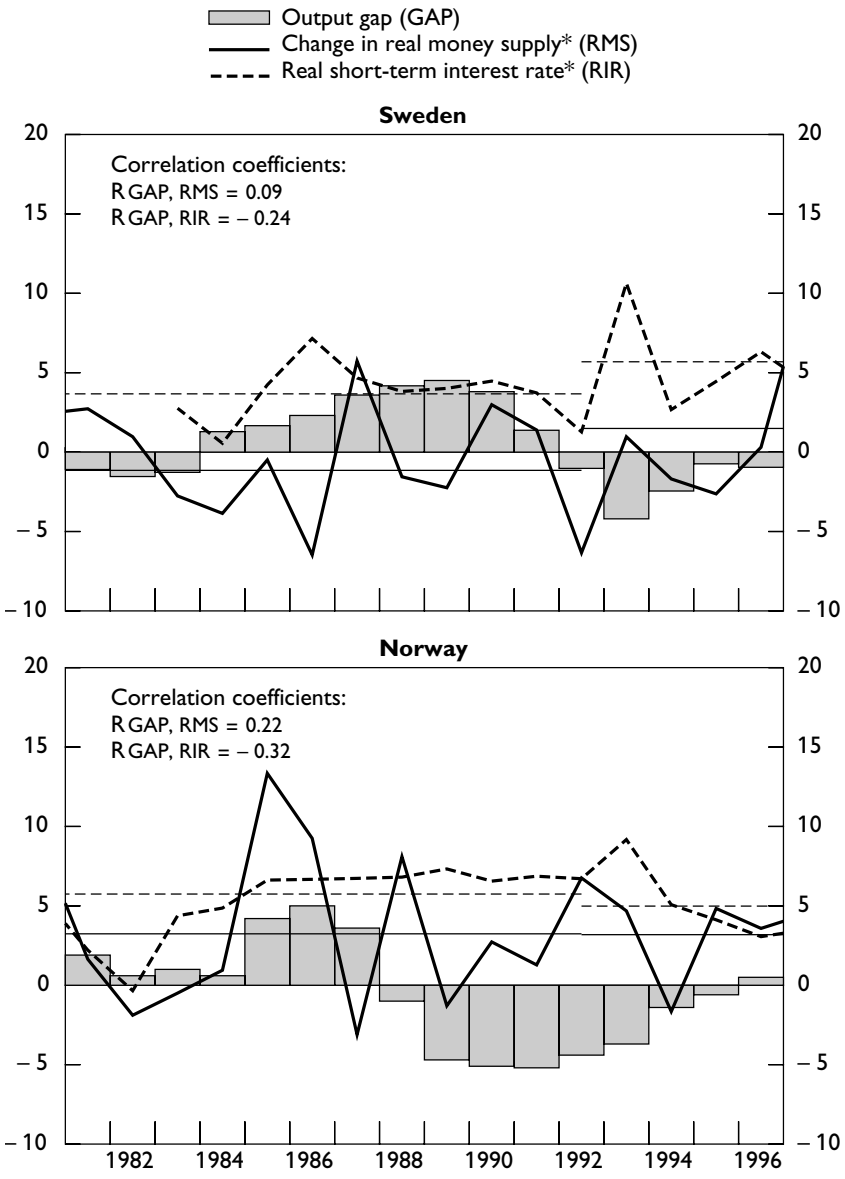
Economic indicators



* Lagged one year. The thin lines represent the averages over the periods 1981–91 and 1992–96.

Graph 1b

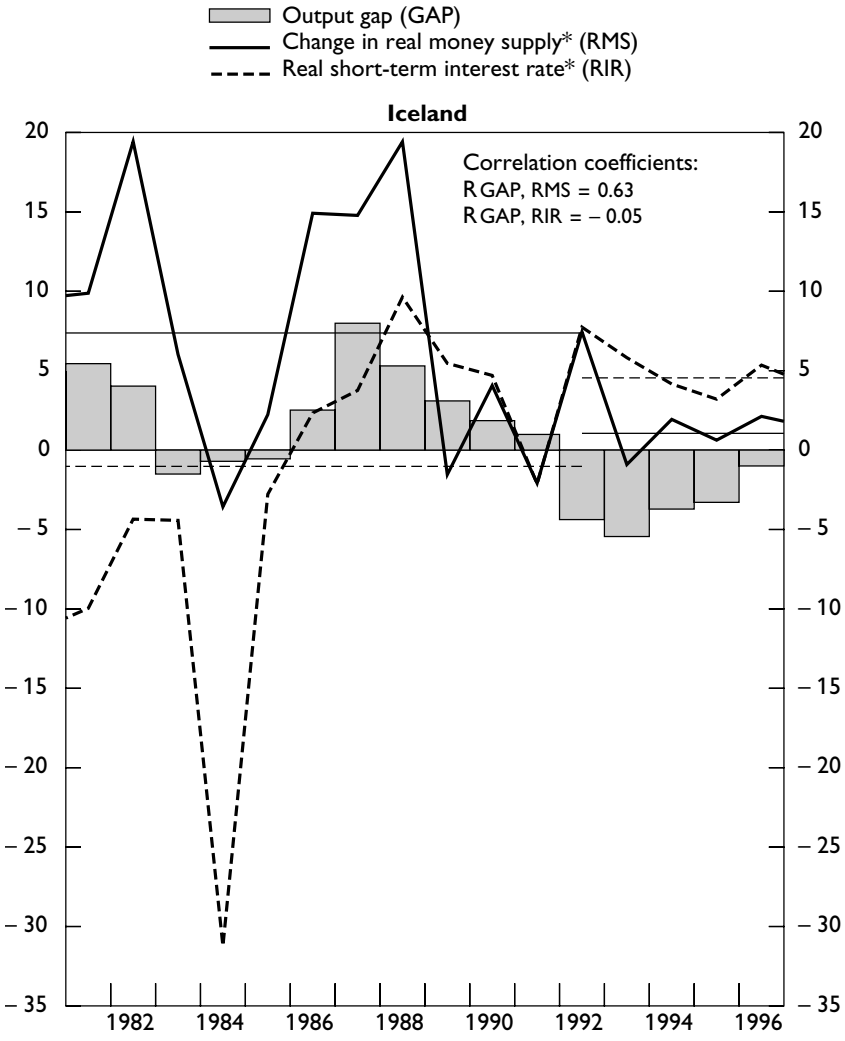
Economic indicators



* Lagged one year. The thin lines represent the averages over the periods 1981–91 and 1992–96.

Graph 1c

Economic indicators

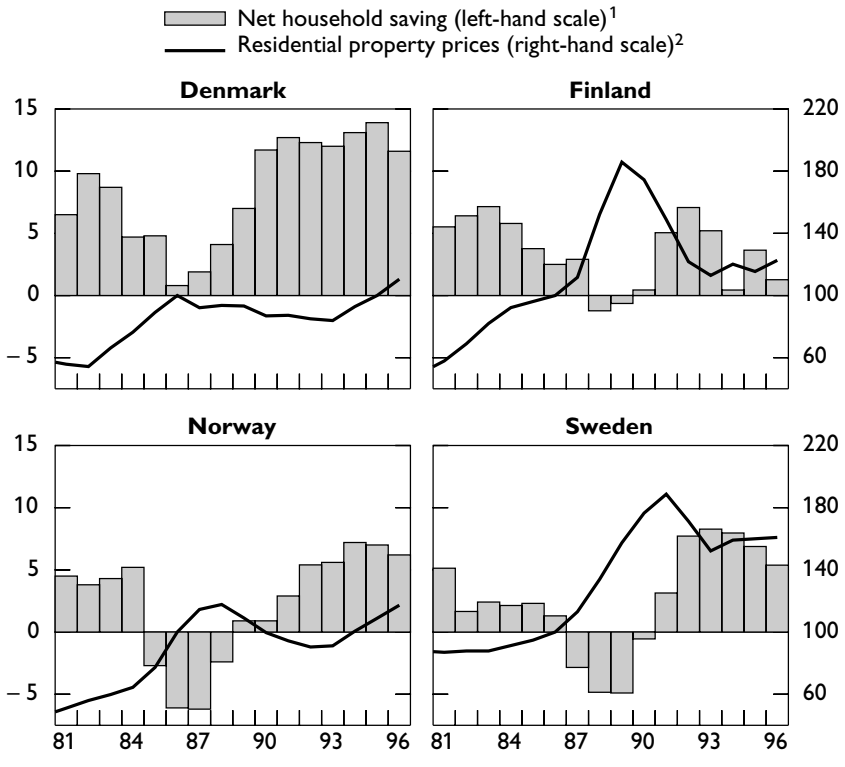


* Lagged one year. The thin lines represent the averages over the periods 1981–91 and 1992–96.

time low when inflation peaked in 1983, but then recovered significantly. It fell again, during the subsequent demand boom but seems to have recovered slightly following the implementation of firmer monetary

Graph 2

Saving rates and property prices



[1] As a percentage of household disposable income. [2] Index, 1986 = 100.

policies after 1992. Household indebtedness has also increased substantially following financial liberalisation and greater access to mortgage financing; however, house prices have been relatively stable.

Changes in the external balance may also be used in assessing recent developments, though mainly as an indicator of the need for policies to correct unsustainable imbalances. Iceland, Finland and Sweden entered this decade with rather large external imbalances which were mainly attributable to fiscal deficits though private saving was also low (Table 3). Taking account of revenues from the oil sector, Norway's external balance was also relatively weak in 1992, whereas Denmark, thanks to a marked strengthening of both private and public saving, had seen a

Table 3

Financial developments, selected indicators

In percentages of GDP*

Countries	1981				1992				1996			
	S/Y	F/Y	Bp/Y	Nx	S/Y	F/Y	Bp/Y	Nx	S/Y	F/Y	Bp/Y	Nx
Denmark	12.4	−6.9	−3.2	93.7	17.7	−2.9	3.3	102.7	17.3	−1.5	1.1	111.3
Norway	29.4	4.4	3.4	117.9	21.0	−1.8	3.5	101.2	30.2	5.9	7.4	102.4
Iceland	21.5	1.3	−4.2	872.8	14.3	−2.8	−3.0	99.3	15.3	−1.7	−2.0	88.3
Finland	24.9	3.5	−1.0	98.1	12.1	−5.8	−4.6	87.6	19.1	−2.6	3.5	91.0
Sweden	15.6	−5.3	−2.6	127.1	13.4	−7.8	−3.5	101.4	17.0	−3.5	2.4	90.0

Notes: S/Y: gross national saving; F/Y: general government financial balance; Bp/Y: balance on current external account; Nx: nominal effective exchange rate.

* For Nx, index, 1991 = 100.

Sources: OECD *Economic Outlook*, June 1997 and author's estimates.

remarkable shift from a perennial external deficit to a large surplus. The divergent needs for corrections were, undoubtedly, another important reason for the different performances during the 1990s, with large cuts in domestic absorption in Finland and Sweden, contrasting sharply with a relatively more relaxed policy stance in Denmark and Norway. Iceland, again, occupies an intermediate position. Influenced by the 1992–93 recession, the current external account moved into surplus in 1993; however, partly due to the need for further fiscal consolidation, it weakened substantially during the economic recovery in 1996.

2.2 External shocks

Despite the importance of foreign trade and the view of many analysts that the setbacks in the 1990s can mainly be explained by external demand shocks, the evidence in Table 4 provides little support to this hypothesis. While Denmark's terms of trade have deteriorated this decade, this was more than offset by more rapid export growth; in the case of Norway, export growth was stable while the terms of trade improved. Even for Finland and Sweden, it is hard to find firm evidence that external shocks were the main cause of the large output gaps. In Sweden, average annual export growth has accelerated by 5 percentage points compared with the 1980s and this has more than offset the deterioration in the terms of trade. For Finland, the acceleration in export growth has been even more pronounced against largely the same terms of trade deterioration as in Sweden.[2] In fact, only in the case of Iceland have external factors had a negative effect on output performance.

Overall, it thus appears that external shocks have not been a principal cause of the divergent performances since 1992; it rather seems, that different needs to correct internal imbalances were the main cause. Indeed, reflecting the "duality" in the two economies where the slowdown this decade was most pronounced, Finland and Sweden, the contribution of net exports to output growth since the trough in 1991 has averaged respectively 2½ and 1½% per year. In contrast, tight policies, combined with low household and business confidence, have meant that

[2] It could be argued that the sub-periods used for Finland are misleading as the breakdown in trade with the former USSR occurred in 1990–91. However, redefining the periods as 1981–89 and 1990–96 only changes the export growth figures to respectively 2.4 and 6.5%. Moreover, while the output gap widened by almost 18 percentage points during 1988–93, the cumulative deterioration in the terms of trade and the 1991 fall in exports directly explain only 3¼ points.

Table 4

External shocks, mean and volatility

Countries	1981–92						1992–96					
	Exports		Terms of trade		Exchange rate		Exports		Terms of trade		Exchange rate	
	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ	μ	σ
Denmark	5.1	2.50	−1.0	2.10	0.9	5.50	2.9	3.30	0.2	1.25	3.8	2.90
Norway	4.4	5.50	−1.5	8.95	0.7	2.15	8.8	3.65	−0.2	5.90	1.8	3.15
Iceland	1.8	6.30	0.3	2.90	−18.8	12.50	4.3	6.05	−2.1	2.55	−1.6	2.75
Finland	1.5	3.25	0.9	2.35	0.5	4.00	10.3	4.80	0.5	2.55	−2.3	14.10
Sweden	3.5	3.20	0.6	2.70	− 0.4	5.75	8.5	4.85	−0.7	2.40	−5.3	13.50
Memo:												
United States . .	*5.5*	*6.70*	*0.8*	*2.35*	*− 1.6*	*8.10*	*7.5*	*3.00*	*0.4*	*0.65*	*0.1*	*3.45*
Germany	*5.4*	*4.20*	*0.7*	*4.25*	*1.1*	*5.30*	*2.5*	*5.25*	*1.0*	*1.15*	*2.4*	*4.10*

Notes: Exports: goods and services, volumes. Terms of trade: ratio between export and import prices. Exchange rate: real effective exchange rate in terms of unit labour costs. μ denotes average annual changes and σ the standard deviation of annual changes.

Sources: National data and BIS data bank.

final domestic demand growth has reduced output in the two countries by respectively 1 and ½% per year. Denmark, on the other hand, entered this decade with relatively modest imbalances, as the process of financial deregulation had been gradual and the corrections of fiscal and external imbalances were well under way. Norway did go through a severe asset price cycle and experienced serious problems in its financial sector, but these shocks occurred in the mid-1980s and their corrections were largely completed by the early 1990s. Iceland entered this decade in deep recession owing to the 1992 terms-of-trade and export shock. Moreover, a relatively tight monetary policy kept domestic demand growth low until last year. However, Iceland has only just started to correct the fiscal and external imbalances and, because of relatively little export diversification, it remains sensitive to external shocks.

3. Labour market developments and their causes

3.1 Cyclical vs. structural forces

Given the large changes in labour market conditions since the beginning of this decade, it is natural ask whether they reflect cyclical or structural forces? In other words, has higher unemployment been due to increases in the structural rate of unemployment (or the NAIRU[3]) or to deviations from a structural rate which could be constant or gradually rising?

3.1.1 The NAIRU as a guide to policies

In a recent discussion of whether the NAIRU is a useful concept for policy-makers and analysts, Stiglitz (1997) applied three criteria: (1) Do deviations of actual unemployment from the NAIRU provide a robust way

[3] In the following, I treat the NAIRU and the structural rate as identical concepts. This is not strictly correct and one useful way of distinguishing between the two (see OECD (1996)) is to start from the following version of the Phillips curve:

(i) $dp_t = dp_{t-1} - \alpha\ (Un_t - Un^*) - \beta\ dUn + z$

where p is the price level (in logs), Un the actual rate of unemployment, Un^* the structural rate of unemployment and z forces affecting the rate of inflation independently of the cycle. For various reasons the rate of unemployment consistent with a stable rate of inflation (the NAIRU) may not be identical to Un^* and by setting $z = 0$ and $dp_t = dp_{t-1}$, the NAIRU can be derived by solving (i) for Un_t:

(ii) $\text{NAIRU} = (\alpha/(\alpha + \beta))\ Un^* + (\beta/(\alpha + \beta))\ Un_{t-1}$.

Thus for α and $\beta > 0$, the NAIRU will be a weighted average of the structural and the lagged rate of unemployment, with the weight of the latter depending on "speed limit" effects as measured by β.

to predict changes in the rate of inflation? (2) Can economists explain why the NAIRU has changed over time? (3) Is the NAIRU a useful way to frame policy discussions in the sense that the Phillips curve is sufficiently robust?

On all three criteria he found the NAIRU concept useful for the United States,[4] whereas for the Nordic countries they are much harder to satisfy. First, because the Nordic countries are small and open economies, inflation will not only depend on labour market conditions but also on external supply shocks, in particular exchange rate changes and terms-of-trade shifts. In fact, external price shocks have, on several occasions, dominated the labour market effects on price inflation. The second criterion is even harder to meet, not only for the Nordic countries but for Europe in general, as it has proved empirically impossible to say whether the marked rise in unemployment since the early 1980s is due to:

- a high degree of persistence as actual unemployment only very slowly returns to the structural rate after shocks;[5]
- various structural changes which have gradually raised the structural rate;
- unchanged structural forces which, however, have far more serious repercussions in the 1980s and 1990s owing to changes in the general macroeconomic environment.[6]

3.1.2 The NAIRU: tentative estimates for the Nordic countries

Against this background, it is not surprising that the Nordic and other European countries also fail the third test. Nonetheless, I attempted to separate structural from cyclical changes, using various simple methods that have been proposed in the literature. First, I estimated the augmented Okun-equation proposed by Gylfason (1997) by regressing the rate of unemployment on the output gap and either a linear or a quadratic

[4] Other authors in the same issue of the *Journal of Economic Perspectives* were much more sceptical.

[5] Persistence itself may reflect the influence of various structural and institutional factors and for some countries it cannot be excluded that inflation depends entirely on *changes* in unemployment (i.e. pure hysteresis) and that the structural rate is a random walk.

[6] For instance, widespread employment protection may be innocuous as long as unemployment is low and stable, but once unemployment increases and becomes less stable, such measures may seriously affect countries' ability to adapt to changes. Similarly, lack of product market competition may do only little damage in a stable environment but, in conditions of large external shocks, lack of competition will seriously impede adjustment and raise unemployment.

Table 5

Structural unemployment, comparative estimates

In percentages

Countries	1986				1990				1996			
	U_1^*	U_2^*	U_3^*	OECD	U_1^*	U_2^*	U_3^*	OECD	U_1^*	U_2^*	U_3^*	OECD
Denmark	9.9	10.9	6.6	8.6	10.2	11.4	7.4	9.6	9.1	8.2	6.5	9.0
Norway	3.7	1.1	2.5	3.1	4.1	4.2	2.5	4.2	4.3	4.1	2.5	4.8
Iceland	1.3	9.5	n.d.	1.0	2.0	6.1	n.d.	2.4	4.2	7.1	n.d.	3.8
Finland	6.4	8.8	11.5	5.5	8.0	13.0	9.6	8.0	13.1	6.6	10.8	15.4
Sweden	3.2	4.1	n.d.	2.1	4.0	6.4	n.d.	3.2	6.9	4.2	n.d.	6.6

Notes: U_1^* derived from Annex Table 1 by setting *gap* = 0. U_2^* derived from Annex Table 2 by setting the balance on the current account (*Bop*) = 0 (3.5 for Norway due to the oil sector) and solving for *Un*. U_3^* derived from Annex Table 3 by arbitrarily assuming that, in equilibrium, the real consumption wage increases by half the rate of productivity growth (with the latter calculated as the average annual change during, respectively, 1980–85, 1985–90 and 1990–96) and solving for *Un*. OECD is taken from OECD (1997). n.d.: "not defined".

trend and then calculated structural unemployment by eliminating the output gap (Annex Table 1).[7] Secondly, I applied an idea proposed by Holden (1996) who defines the structural rate as the rate of unemployment consistent with external equilibrium (Annex Table 2). Thirdly, I used wage adjustment equations and derived the structural rate by assuming that changes in real wages had to equal the rate of labour productivity growth (Annex Table 3). In Table 5, these estimates are compared with those presented in OECD (1997).

3.1.3 NAIRU and the output gap

The measures of the structural rate obtained by the first approach (U^*_1) are rather close to the OECD estimates of the NAIRU, even though the methods applied are entirely different. According to the results, labour market slack, in all the Nordic countries, has increased relative to output slack, implying that more rapid demand growth will not be sufficient to reduce unemployment to previous levels. There are, however, some differences.[8] In Denmark and Norway, a non-linear trend was identified, which is much steeper for Denmark than for Norway and implies that structural unemployment started to fall after 1990 in Denmark and only somewhat later in Norway. For the other countries it appears that the rise in unemployment is best explained by a linear trend combined with intercept shifts. Although an intercept shift is a very crude way of identifying the influence of policies, it is, nonetheless, interesting to note that both Finland and Sweden experienced an upward shift following the breakdown of the fixed exchange rate regime and the implementation of policies to correct earlier financial imbalances. By contrast, in the case of Iceland, a downward shift seems to have accompanied the implementation of a less accommodating monetary policy in the early 1980s.

[7] Gylfason (1997) assumes that the actual efficiency of an economy is proportional to the "optimal efficiency" by a factor = $(1 - \alpha r(dUn)$, where α is the coefficient with respect to labour in a Cobb-Douglas production, *dUn* is the change in the rate of unemployment and *r* is a measure of labour market rigidities. On this assumption, actual unemployment can be estimated from the equation:

$Un = Un^* - r\ dUn + \beta\ gap$, where *gap* = log ratio of actual to potential GDP.

However, when estimating this equation, I always obtained a positive coefficient for *dUn* and when attempting to capture rigidities by including one and two-year lagged values for *Un* instead of *dUn*, the coefficient on *gap* was either insignificant or of the wrong sign. Consequently, I implemented the equation as described above.

[8] It might also be noted that the cyclical sensitivity of unemployment seems to be highest in Finland, followed by Denmark and Sweden. Due to the high degree of unemployment persistence found in all countries, differences in the cyclical sensitivity may have influenced the structural measures given in Annex Table 1.

3.1.4 NAIRU and external equilibrium

When structural unemployment is defined as the unemployment rate consistent with external equilibrium, the estimated rates are both volatile and rather different from the OECD data. Although the structural measures (U^*_2) derived from balance of payment figures seem excessive in some cases and could be too heavily influenced by specific features or events of the three years shown, they do provide some policy relevant information. For instance, in the case of Iceland, where the deficit on the current balance of payments has averaged 3½% for the last 20 years, domestic absorption obviously has to be considerably lower (and the rate of unemployment correspondingly higher) if external equilibrium is to be achieved. Similarly, for Finland and Sweden, domestic absorption was too high following the boom in the 1980s whereas for Denmark the high structural rate in 1990 mainly reflects the heavy foreign debt burden and the relatively high interest rate of that year.

With respect to the influence of exchange rate changes (Annex Table 2), the estimates for Finland, Norway and Sweden generate a reduced-form "trade off" between the real effective exchange rate and the structural rate of unemployment.[9] Based on these reduced forms, the structural unemployment rate derived for Norway in 1986 may understate the "true" rate as the exchange rate was rather low; otherwise Norway's real effective exchange rate has been comparatively stable. For Finland and Sweden, the structural unemployment rates for 1996 are probably also understated. The real effective exchange rates are respectively 30 and 20% below their 1990-values and it seems rather implausible that unemployment could fall to respectively 6½ and 4¼% without higher wage inflation and a real appreciation. Moreover, the substantial improvement in companies' net financial position, which in both countries has contributed to the strengthening of the current external account, can to a large extent be attributed to a large decline in the investment/GDP ratio. If unemployment in the two countries were to be reduced as shown in Annex Table 2, these investment declines would probably be reversed as a significant rise in employment is likely to require a supporting increase in the capital stock.

[9] For Iceland, on the other hand, the exchange rate effect seems to be dominated by the terms-of-trade effect and, for Denmark, only *changes* in the exchange rate are significant.

3.1.5 NAIRU and wage inflation

The wage equations (Annex Table 3) produced the least robust and plausible estimates. Given the definition of structural equilibrium, the equations were initially specified with product prices among the explanatory variables but this only produced sensible results for Denmark. Second, the coefficients for productivity growth are not very well determined and, allied with the fact that productivity growth is not exogenous but increases in periods of strong cyclical recoveries (as in Norway in 1996) or by the closing down of the least competitive firms (Denmark in the 1990s), the derived structural rates are subject to a large margin of error. Third, for Iceland and Sweden, hysteresis could not be rejected once the homogeneity conditions were imposed.[10]

When averaging the structural measures (Table 6), it appears that Norway entered the 1990s with labour market slack which was progressively reduced over the next six years. The Danish labour market seems to have been broadly in balance at the beginning of this decade but developed some slack in the course of the 1990s. In the other countries, by

Table 6
Structural and actual unemployment, average estimates
In percentages

Countries	1990		1996	
	Average[1]	Actual[2]	Average[1]	Actual[2]
Denmark	9.6	9.5	8.2	8.9
Norway	3.7	5.2	3.9	4.2
Iceland	3.5	1.8	5.0	4.3
Finland	9.6	3.5	11.5	16.4
Sweden	3.4	1.6	5.9	7.9

[1] Unweighted averages of structural estimates given in Table 5. [2] Actual rates of unemployment.

[10] This conclusion, however, is contestable. When testing the time series properties of unemployment, the null hypothesis of hysteresis cannot be rejected for *any* of the Nordic countries (see Annex Table 6) or for Germany. It could, however, be argued, that because of the high degree of persistence of unemployment, the sample period (1960–96 for most countries) may be too short for a unit root test. For example, when doing a similar tests for the United States, France and the United Kingdom based on sample periods of 100–150 years, Bianchi and Zoega (1997) find that the unemployment series for the three countries are stationary around infrequently changing means.

contrast, strong growth during the second half of the 1980s had led to overheating and excess demand had to be substantially reduced this decade; in fact, Iceland may have to reduce labour demand even further if the current account deficit is to be eliminated.

3.2 Broader measures of labour market rigidities

Given the conceptual as well as statistical problems in deriving sensible measures of the NAIRUs, it might be more fruitful to adopt the approach suggested by Henry and Snower (1996) and look at "intermediate" models containing a broad range of rigidities.[11] When labour markets do not adapt or adapt too slowly, it is not sufficient to look at the wage formation process alone, since the underlying causes may be located in output markets or in firms' hiring practices. Hence, to supplement the information discussed above price and employment equations were also estimated (see Annex Tables 4 and 5), with the principal parameters of this broader framework summarised in Table 7.[12]

As the table shows, wages in Norway are highly responsive to the level of unemployment, whereas consumer prices do not respond to slack in the product market; nominal rigidities also seem much higher in output markets than in labour markets. Moreover, while employment responds fully to output changes in the long run, the adjustment is rather slow.[13] In contrast, employers in Denmark respond quickly to output changes[14] and consumer prices are also quite sensitive to the level of output slack, notwithstanding a relatively high degree of nominal price rigidity. The cyclical sensitivity of wages is about half as large as in Norway and also well below that found for Germany. In several respects, Finland represents an intermediate case. Nominal wage rigidities are higher than in

[11] See also Franks (1997) who argues that because the adjustment lags in the labour market frequently exceed the average time between shocks as well as the length of the average cycle, shocks will feed back on each other and generate persistence far beyond what one expect from natural rate models.

[12] In a "right-to-manage-model", firms simultaneously determine both prices and employment, so that the price and employment equations are really "two sides of the same coin". However, as noted by Bean (1994), this equivalence is rarely satisfied in practice and in the following I have regarded the price and employment relations as independent equations.

[13] Norway and Sweden are the only countries for which the elasticity of employment with respect to output is unity in the long run. This might reflect the policy of using public sector employment to absorb labour market slack; a policy still used in Norway and, in the case of Sweden, for much of the period of estimation.

[14] As discussed below, this may reflect the relatively liberal lay-off rules.

Table 7

Wage, price and employment rigidities, selected measures

Countries	Wage equation[1]			Price equation[2]			Employment equation[3]			Total		
	β	α	η	δ	μ	ω	λ	π	σ	ρ	Real[4]	Nom[5]
Denmark	−1.03	0.00	0.29	0.23	0.29	0.14	0.57	0.65	−0.37	0.00	1.34	0.14
Norway	−2.13	0.00	0.23	0.00	0.40	0.17	0.43	0.49	−0.10	0.48	0.95	−0.14
Iceland	−6.89	1.00	0.27	0.23	0.30	0.51	0.19	0.49	−0.11	0.00	0.83	0.54
Finland	−4.36	0.70	0.36	0.09	0.15	0.22	0.63	0.69	−0.11	0.00	0.99	0.01
Sweden	−4.71	1.00	0.67	0.05	0.36	0.13	0.51	0.45	−0.18	0.52	0.68	−0.70
Memo:												
United States . .	*−1.98*	*0.00*	*0.29*	*0.24*	*0.56*	*0.04*	*0.40*	*0.74*	*−0.44*	*0.23*	*1.68*	*0.08*
Germany	*−4.00*	*0.67*	*0.19*	*0.24*	*0.17*	*0.07*	*0.76*	*0.68*	*−0.21*	*0.34*	*1.30*	*−0.29*

[1] The parameters are obtained from the estimates in Annex Table 3: $dw = \phi + \varphi\ dpc + (1 - \varphi - \eta)\ dpc_{-1} + \eta\ dw_{-1} + \beta\ Un + \beta\alpha\ Un_{-1} + \kappa\ dq$, where *dw* = percentage change in compensation per employee; *dpc* = percentage change in consumer prices; *Un* = rate of unemployment in logs and *dq* = rate of productivity growth, total economy. β or $1/\beta$ can be interpreted as measuring the "real" rigidity or (flexibility), with a large value (in absolute terms) indicating that wages are flexible. α measures the degree of labour market hysteresis while the "nominal" rigidity is captured by η. [2] The parameters are obtained from the estimates in Annex Table 4: $dpc = \nu + \delta_1\ gap + \delta_2\ gap_{-1} + \mu\ dulc + \lambda\ dpc_{-1} + \omega\ dpm$, where *gap* = output gap, *dulc* = changes in unit labour costs (for the United States changes in compensation per employee) and *dpm* = changes in import prices. Corresponding to the wage equation, δ can be interpreted as a measure of the "real" rigidity (or flexibility) while λ measures the "nominal" rigidity. I found no evidence of hysteresis in output markets. [3] The parameters are obtained from the estimates in Annex Table 5: $dem = \xi + \pi_1\ dy + \pi_2\ dy_{-1} + \sigma_1\ drw + \sigma_2\ drw_{-1} + \rho\ dem_{-1}$, where *dem* = changes in employment, *dy* = change in real output (GDP) and *drw* = changes in real labour costs. The parameters π and σ can be interpreted as measures of "real" employment rigidities while ρ indicates the nominal rigidity or the speed of adjustment. [4] Defined as: $-\beta + \delta + \pi - \sigma$. [5] Defined as: $1 - (\eta + \lambda + \rho)$.

Denmark and Norway and there is also a rather high degree of hysteresis in the labour market, though significantly less than in Iceland and Sweden. Employment seems highly sensitive to changes in output whereas the coefficient with respect to real labour costs is relatively low.[15] The responsiveness of consumer prices in Finland is rather sluggish as changes in the output gap have little impact and the nominal rigidity is high.

As already mentioned, complete hysteresis could not be rejected for Iceland and Sweden and Swedish wages also seem to be nominally rigid. In addition, consumer prices in Sweden respond slowly and very little to changes in output slack and while the long-run employment elasticity with respect to output is close to unity the speed of adjustment is as low as in Norway. In Iceland, by contrast, consumer prices and employment are sensitive to changes in output and the output gap and the lags are short.

When aggregating the various rigidity indicators (see the last two columns of Table 7), it appears that Denmark has the highest degree of real flexibility among the Nordic countries (about equal to that of Germany but well below that of the United States) and mainly because of the responsiveness of employment to changes in output and real wage costs.[16] Norway and Finland share second place, while Sweden seems to have the lowest real flexibility, though, in part, this reflects the assumption of labour market hysteresis. Sweden also obtains the lowest rating with respect to aggregate nominal flexibility,[17] with about equal contributions from all three equations. On this measure, Iceland gets the highest rating as employment adjusts instantaneously and price adjustments are also subject to a very short lag. Denmark takes second place despite rather slow price adjustments while Finland and Norway are further back, Finland mainly because of slow price adjustments but Norway also due to long lags in the adjustment of employment.

[15] In fact, significant coefficients for real labour costs were only obtained for Denmark and Sweden.

[16] Because real wage flexibility (β) is estimated with respect to the log of unemployment, the estimated coefficients have been divided by the rate of unemployment in 1992.

[17] This measure should perhaps rather be interpreted as a broad indicator of the speed of adjustment. According to our estimates, the United States does not get a particularly low ranking even though the United States is often characterised as combining a high degree of real flexibility with a low degree of nominal flexibility. It could be argued, however, that the rather high coefficient with respect to lagged price changes in the wage equation should also be included in assessing nominal flexibility and on this broader measure the ranking of the United States would be significantly lower.

3.3 Changes in employment by explanatory factor

As a final piece of "analytical input", I have applied the estimated employment equations in "explaining" employment changes this decade (Table 8). Finland obviously suffered the steepest employment decline as output largely stagnated for the period as a whole and firms cut back labour to maintain competitiveness. Despite some moderation of the growth of real consumption wages in Finland, real wage costs advanced by a cumulative 17%, suggesting that even in conditions of very high unemployment, real wage restraint is difficult to generate in a period of decelerating or very low price inflation. It may, of course, be argued that employment could have been maintained, if only the self-regulating mechanisms had been stronger. However, even assuming that the elasticity of employment with respect to real labour costs is unity and taking output growth as given, real labour costs would have had to fall by 12½% to prevent firms from cutting back their labour force to preserve competitiveness.[18]

Output also stagnated in Sweden and even though cutbacks (as measured by the trend term) were less pronounced than in Finland, employment fell by a cumulative 11%. The residual error is, however, rather high suggesting that the equation is poorly specified. The latter applies even more Iceland, whereas the figures shown for Norway and Denmark are more satisfactory. Norway is the only Nordic country

Table 8
Cumulative changes in employment by "causal" factor
1990–96

Countries	Output[1]	Real wages[1]	Trend	Rest[2]	Employment
Denmark	8.4 (13.5)	−4.1 (11.0)	− 4.0	−1.7	− 2.0
Norway	10.3 (31.8)	−0.6 (7.9)	− 7.4	1.0	3.8
Iceland	4.4 (11.0)	−0.8 (20.4)	–	−3.9	− 0.3
Finland	0.8 (7.6)	−1.7 (16.7)	−12.5	−2.7	−16.1
Sweden	0.0 (5.2)	−2.9 (11.3)	− 4.3	−3.7	−10.9

[1] Figures in brackets indicate actual changes in, respectively, output and real wages.
[2] Unexplained residual.

[18] If I take the estimated real wage elasticity of 0.1, real wages, or the nominal exchange rate, would have had to fall by an implausible 125% (!!).

which has managed to increase employment this decade which is partly attributable to relatively expansionary macro-policies and rapid output growth. However, it also reflects the successful use of incomes policy (the "Solidarity Pact") to generate support for real wage restraint. Denmark, by contrast, has witnessed rather rapid real wage growth which, via the relatively high real wage elasticity of labour demand, has offset about half of the output-induced employment gains.

The following section attempts to relate these various analytical measures to general labour market features in the Nordic countries and to the policies pursued. The aim is not to provide a detailed description of the Nordic labour markets or of all the policy changes that have recently been implemented.[19] Rather the section will focus on some distinctive features which may help to explain developments in the 1990s.

4. Labour markets: main features and policies

For most of the post-war period full employment has been the overriding goal of economic policies in the Nordic countries. In many respects it still is in Norway, while Denmark had to lower the priority of achieving this goal in the short run from the early 1980s and Finland, Iceland and Sweden ten years later. The "operative framework" can be analysed in terms of the Rehn-Meidner model, which was initially designed for Sweden to reconcile full employment with low inflation, while facilitating sectoral changes and promoting overall growth. The model, which has also played some role in the other countries, consists of three basic elements (Henrekson et al. (1997)):

(i) restrictive fiscal and monetary policies to ensure low inflation;
(ii) a solidaristic wage policy, defined as equal pay for equal work regardless of productivity and profit developments;
(iii) an active labour market policy aimed at moving those who became unemployed due to the solidaristic wage policy as well as the restrictive macro-policies to a new job.[20]

[19] Recent policy changes are discussed in the latest OECD *Country Surveys*.

[20] When the author visited the Labour Market Board on his first OECD mission to Sweden in early 1974, the director described his principal function as "*taking each unemployed person by the hand and guiding him/her to a new job*". Despite the first oil price shock, unemployment in Sweden declined from 2.5% in 1973 to only 1.6% in 1975.

This framework worked relatively well in the 1950s and 1960s. However, during the more turbulent 1970s and 1980s major imbalances and inconsistencies emerged, with severe consequences for macroeconomic stability. In many ways, the problems faced in the 1990s can be linked to these imbalances and their underlying causes.

4.1 Solidaristic wage policy, unemployment and real wage flexibility

Labour markets in the Nordic countries are characterised by a high degree of organisation of both workers and employers and wage bargaining is usually centralised.[21] Even if supplementary sectoral or industry-based agreements have tended to capture differences in labour market pressures through wage drift, this set-up has been conducive to maintaining a very equal earnings distribution (Table 9). However, by also generating a low degree of relative wage flexibility, the solidaristic policy seems to have reduced the countries' ability to adapt to both adverse shocks and lower rates of inflation and thus raised the overall rate of unemployment compared with what it otherwise would have been.

Particularly in recent years, when the countries have succeeded in reducing inflation to, or even below, the OECD average, several analysts have pointed to an apparent decline in real wage flexibility (Gudmundsson (1994) and OECD country surveys). It appears, however, that the root of the problem are the solidaristic wage policies and the resultant lack of relative wage flexibility rather than the behaviour of aggregate real wages. Precisely in periods when both inflation and productivity growth are low and/or when distinct dualistic features have emerged in some of the economies, the number of firms which need to cut nominal wages to remain competitive will tend to rise and if nominal wage cuts are inconsistent with policies regarding equity, unemployment has to increase to maintain low price inflation.[22] Because the least efficient firms are likely to be closed down, average real wage growth may even increase, giving the

[21] Although not part of the Rehn-Meidner model and rarely used in Sweden, tri-lateral agreements, with government tax concessions or interest rate and exchange rate commitments, have been frequent in Finland, Iceland and Norway. When faced with particularly difficult adjustment problems, governments in all the Nordic countries have also resorted to decrees.

[22] While none of the Nordic countries have a statutory minimum wage, settlements frequently include relatively high minimum wages for the overall economy as well as for specific sectors and groups.

Table 9

Selected labour market characteristics

Countries	Long-run unemployment[1]	Labour costs[2]	Net replacement rate[3]	Dispersion of earnings[4]		Part-time workers[5]	Hours worked[6]	Temporary workers[7]	Employment protection[8]	Activity rate[9]	Public employment
	1996	1996	1994	1980s	1990s	1996	1996	1994	1995	1996	1996
Denmark	26.5	82 (25)	95	2.14	2.17	21.5	1,525	12.0	4	74.7	30.8
Norway	14.0	84 (49)	75	2.06	1.98	26.5	1,410	8.0	8	76.8	30.5
Iceland	19.2	77 (n.a.)	n.a.	n.a.	n.a.	27.9	1,970	n.a.	n.a.	84.8	19.3
Finland	35.9	79 (82)	89	2.46	2.38	8.0	1,790	13.5	9–10	62.2	23.6
Sweden	17.1	79 (71)	89	2.04	2.13	23.6	1,554	13.5	11	72.7	31.8
Memo:											
United States . . .	*9.5*	*56 (38)*	*60*	*3.25*	*4.35*	*18.3*	*1,951*	*2.2*	*1*	*75.0*	*15.4*
Germany	*48.3*	*100 (82)*	*77*	*2.69*	*2.32*	*16.3*	*1,560*	*10.3*	*9–10*	*64.0*	*15.5*

[1] Persons unemployed for more than 12 months as a percentage of total unemployment. [2] Total labour costs per hour in manufacturing (for Iceland, compensation per employee in private sector), indices, western Germany = 100; figures in brackets indicate the percentage ratio of non-wage labour to wages. [3] Marginal tax rates facing unemployed single-earner household, at two-thirds of the average production worker's level of earnings and calculated after tax and social benefits, including housing benefits. [4] Ratio of upper limit of earnings in 9th decile to upper limit of earnings in 1st decile. [5] Part-time workers as a percentage of total employment. [6] Average annual hours worked per person employed. [7] Workers on temporary contracts as a percentage of total employment. [8] Summary rankings (lowest rank = lowest degree of protection). [9] Employment as a percentage of population of working age. [10] Government employment as a percentage of total employment.

Sources: OECD *Economic Outlook*, June 1997, OECD *Employment Outlook*, July 1997, OECD *Country Surveys* and Institute of the German Economy *IW-trends*, 2/1997.

impression that aggregate real wages have become less sensitive to unemployment.[23]

This impression of a recent rise in real wage rigidities also appears from changes in profit shares and rates of return for the business sectors (Graph 3). For instance, while most of the countries have witnessed a trend rise in profits since 1980 (in several cases reversing an earlier steep decline), Finland and Sweden experienced a partial reversal of this trend in the early 1990s when the rise in unemployment was most pronounced. Moreover, over the last couple of years, when price inflation was reduced to unprecedented low rates, profit shares declined in Denmark, Norway and Sweden. Similarly, in Iceland, the profit margins narrowed in the second half of the 1980s when price inflation fell sharply and, even after a slight recovery this decade, they have remained below the earlier peak.[24]

It is more difficult to say whether the solidaristic wage policy has also contributed to the historically high rates of price inflation in the Nordic countries. However, it cannot be excluded that it lead to higher nominal wage increases due to "leapfrogging". Typically, centralised settlements have tended to equalise the earnings distribution by boosting wages of low-income workers. Subsequently, supplementary sectoral agreements and wage drift widened the distribution of earnings due to excess demand for skilled workers and differential sectoral rates of productivity gains. In the following central agreements, claims for restoration of the previous distribution were then made and usually validated by the authorities.

It is also difficult to say whether the solidaristic wage policy will "survive" recent moves towards a more decentralised bargaining structure. Especially in conditions where the exposed sector grows more

[23] To some extent, such reactions may also explain the seemingly conflicting persistence measures for respectively unemployment and the rate of inflation. For instance, based on cross-country estimates of the following equation:

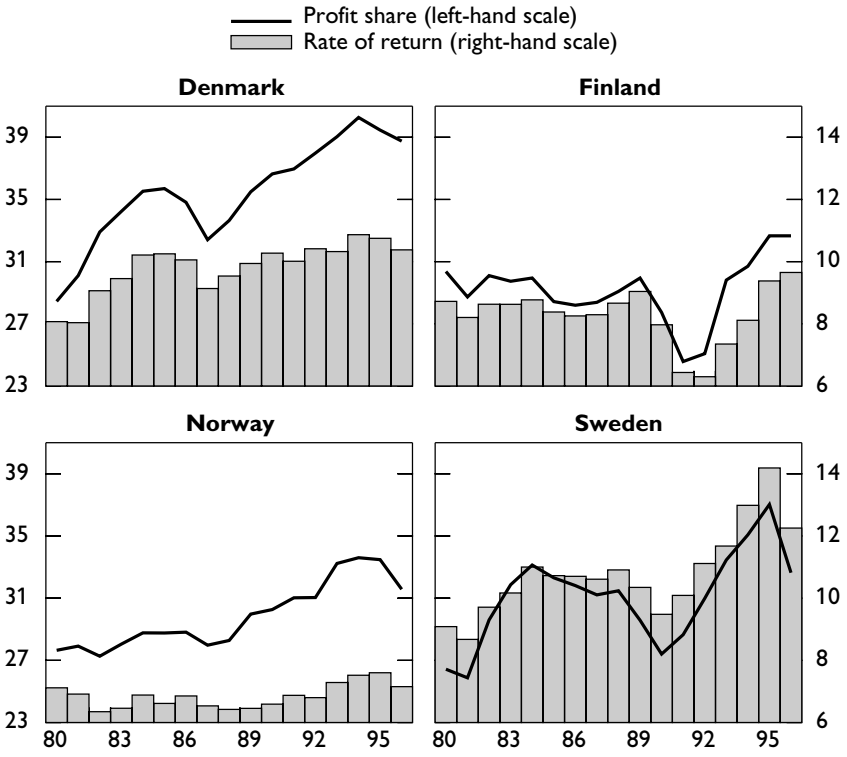
$Un - Un_{-1} = \alpha + \beta\ gap + \chi\ disp + \epsilon\ Un_{-1}$,

where *Un* is the rate of unemployment, *gap* the GDP gap, *disp* a measure of the sectoral dispersion of employment changes and persistence is defined as $1 + \epsilon$. OECD (1997) finds persistence rates of 0.65–1.00 for the Nordic countries (Iceland was not included in the analysis), compared with 0.15 for the United States and 0.60 for Germany. In contrast, by using country-specific estimates of inflation equations and measuring inflation persistence by the coefficient on the lagged rate of inflation, Anderton (1997) concludes that the Nordic countries (again excluding Iceland) have a relatively low degree of persistence. Moreover, the shift towards more anti-inflation policies in the 1980s seems merely to have reduced the average rate of inflation in the Nordic countries, whereas, according to Anderton's estimates, countries, such as the United States, the United Kingdom and Canada, have managed to reduce the persistence as well as the average rate of inflation. Needless to say, this issue needs further analysis.

[24] The peak in 1983–84 may have been due to a partial wage freeze as part of the disinflationary policy implemented in the early 1980s.

Graph 3

Profit shares and rates of return, business sector



rapidly than the sheltered domestic sector, a widening of earnings distributions might be expected. Nonetheless, both Denmark and Sweden have seen significant changes towards decentralisation without any measurable effects on the structure of relative wages; in Finland the decision to temporarily abandon a centralised agreement in 1993–94 to allow a wider sectoral dispersion of wage changes mainly boosted aggregate wage growth but left the distribution of earnings largely unchanged. In Norway, moves towards decentralisation are still being resisted on the grounds that sectoral wage settlements are incompatible with the current incomes policy framework and that, in the past, such settlements have led to higher inflation.

4.2 Public employment, high taxes and disincentives to work

Because the Nordic countries were at "over-full employment" during most of the 1960s and 1970s, wage growth was excessive relative to major trading partners. Moreover, with accommodating rather than restrictive policies, the solidaristic wage policy did not, as had initially been assumed, encourage employment shifts from firms with low productivity to more profitable sectors. In fact, owing to a policy of stable nominal exchange rates, the fast-growing companies in the exposed sector progressively lost their international competitiveness.[25] As a result, a typical feature of the Nordic countries has been that the public sector ended up as "an employer of last resort" while private sector employment declined.[26] In some of the countries, the rise in public sector employment was reinforced by other measures, including regional policies resisting the closing down of unproductive enterprises. In addition, the comparatively high level of social and other services provided by the governments not only raised aggregate taxes but also tended to reduce labour mobility.

More recently, the need to consolidate fiscal balances has, except for Norway and perhaps also Iceland, forced the Nordic countries to discard earlier policies of compensating private-sector job losses by more public jobs. The countries now attempt to adapt to external shocks by trying to raise real wage flexibility or promote job creation in the private sector,[27] rather than by equalising demand and supply in the labour markets through public-sector job creation. For example, over the last five years

[25] A "sub-model" of the Rehn-Meidner model is the Scandinavian model of inflation, based on the assumption that nominal wage gains are determined by productivity growth and international price changes in the exposed sector. Through the solidaristic wage policy, wage growth in the exposed sector would also determine nominal wages in the sheltered sector. However, because employment was maintained at a too high level, the assumed chain of causality in the inflation model broke down. Thus the sheltered sectors (typically the building sector and, in some cases, also the public sector) have frequently been the wage leaders and through the solidaristic wage policy excessive wage increases and a gradual loss of international competitiveness were imposed on the exposed sectors.

[26] According to the growth-accounting model in Henrekson et al (1997), the contribution of labour to output growth in the non-government sector of Sweden was –½% per year during 1960–90; since 1990 private sector employment in Sweden has fallen further (Bäckström (1997)).

[27] In Sweden, however, the "downsizing" of the public sector and the promotion of job creation in the private sector still seem to be met with some reluctance or resistance. For instance, the Government's programme to halve unemployment by the year 2000 does not contain a single measure to promote private-sector employment growth. By contrast, the programme announced by Finland includes several such measures, in particular the creation of small to medium-sized firms.

Denmark, Finland and Sweden have cut public sector employment even as private employment was falling. In Norway, by contrast, public employment has continued to grow and the rather slow adjustment of employment as well as the low and statistically insignificant real wage elasticity (see Annex Table 5) could well result from the full employment policies still being pursued.

Due to the high government shares of output and employment, average and marginal tax rates are high in the Nordic countries. Even after recent tax reforms to reduce marginal rates, the disincentives faced by unemployed workers have remained high, notably when various subsidies are also taken into account (Table 9). How much this has influenced unemployment is difficult to say but it is worth recalling Agell's observation that even though labour supply elasticities with respect to the tax wedge are very low, they do become important when the marginal tax and subsidy wedges approach 90%.[28]

4.3 Employment protection and the insider-outsider model

The degree of employment protection and the implicit disincentives for employers to hire new workers differ quite markedly between the Nordic countries (Table 9). Denmark has the most liberal system, as employers face few constraints in laying off workers while unemployed workers are compensated by relatively high unemployment benefits for several years. Swedish employers have wide discretion in deciding when lay-offs are required and severance pay is voluntary. However, notice periods are long, the principle of "last-in-first-out" has to be adhered to and there is a one-year re-hire obligation. Moreover, because employers face very high penalties in case of "unfair dismissals", Sweden has a rather high protection rank.[29] These disincentives are likely to have increased the bargaining

[28] The high marginal rates not only reflect the tax and subsidy structures but are also the result of generous unemployment benefit systems with almost unlimited duration and liberal eligibility criteria.

[29] While I was unable to reproduce Gylfason's (1997) empirical estimates, I fully agree with his observation that (Gylfason (1997) pp. 19–20):

"the labour rigidity inherited from the 1970s did not become a binding constraint on the hiring and firing decisions of Swedish employers until the economy took a deep dive in the 1990s. In the 1970s and 1980s the malfunctioning of the Swedish labour market tended to be overlooked because the Government acted as an employer of last resort by expanding public-sector employment when demand for labour in the private sector declined and also because the Government devalued the currency more than once in an attempt to restore profitability to Swedish exports".

power of the employed (the "insiders") at the expense of the unemployed (the "outsiders") and may, thus, explain why output growth has created relatively few new jobs in recent years. The power of insiders could also be the reason that wage growth started to accelerate when the rate unemployment was still very high by past standards.[30] Norway is ranked with a median degree of protection while Finland is somewhat higher. As in Sweden, this may have played a role in the acceleration of wage growth in 1993–94 and might also, in part, explain why the moderation in 1992–93 as well as that expected for 1995–98 could only be achieved with the help of tax concessions.

4.4 Other factors and influences

Recent discussions of rigidities have mostly focused on labour markets, but an important source of such rigidities, even in labour markets, is often found in product markets. In particular, given technological progress and international competition, most industrial countries need to shift resources from the tradable to the non-tradable sectors, and the extent to which the latter are regulated will, therefore, importantly affect countries' ability to adapt. In this respect, the Nordic countries appear to have wide scope for improvement. For instance, when regressing relative price levels on per capita GDP, the OECD finds that relative prices in the Nordic countries are much higher than their relative income position would imply, with particularly large "excesses" for Denmark and Sweden.[31]

While a relatively high aggregate price level can have many sources and causes, lack of competition in the manufacturing sectors does not seem to be among them. On the contrary, judging by mark-up ratios (Table 10), most manufacturing industries in the Nordic countries appear to be competitive, notably (and naturally) the key export sectors. By contrast, the adaptability and absorptive capacity of the non-tradable sectors are constrained by a host of regulations and, in several cases, by

[30] As noted by Bäckström (1997), the number of hours worked rose by the equivalent of 135,000 jobs during the latest economic upswing in Sweden. However, only 85,000 new jobs were actually created as firms preferred to extend the number of working hours for those already employed. The acceleration in nominal and real wage growth in 1995 occurred when registered unemployment was still close to 8% and total unemployment almost 12%.

[31] On this basis, relative prices are also "too high" in Germany but rather low in the United States; see OECD, Economic Survey for Sweden, 1997.

Table 10

Mark-ups in selected industries

1980–92

Industry	Denmark	Norway	Finland	Sweden	*United States*	*Germany*
Textiles, apparel	1.15	1.13	1.17	1.13	*1.10*	*1.11*
Footwear, leather	1.21	1.15	1.11	1.12	*1.10*	*1.09*
Iron and steel	1.09	1.25	1.30	1.09	*1.10*	*1.18*
Wood, furniture	1.14	1.15	1.27	1.10	*1.14*	*1.15*
Chemicals, plastics	1.14	1.09	1.30	1.19	*1.16*	*1.29*
Non-metallics	1.25	1.25	1.39	1.12	*1.19*	*1.28*
Paper, printing	1.11	1.11	1.22	1.17	*1.17*	*1.19*
Medicine, drugs	1.42	1.26	1.42	1.26	*1.33*	*1.44*
Metal products	1.14	1.16	1.22	1.12	*1.10*	*1.20*
Radio and TV	1.10	1.16	1.59	1.30	*1.38*	*1.28*
Office equipment	1.44	1.45	1.92	1.17	*1.39*	*n.a.*
Motor vehicles	n.a.	1.19	1.17	1.12	*1.06*	*1.13*
*Average**	*1.20 (24)*	*1.18 (27)*	*1.27 (33)*	*1.16 (20)*	*1.16 (29)*	*1.25 (26)*

* Unweighted average; figures in brackets indicate the number of industries for which mark-up rates were estimated.

Source: Martins et al. (1996).

state monopolies.[32] However, because data for the services sector are less readily available than for manufacturing, it is difficult to get precise estimates of these rigidities; hence, the following discussion, based on Tables 11–12, should be interpreted as merely illustrative.

One striking feature of developments in the Nordic countries during the last 10 years is the marked fall in employment relative to output (Table 11). Labour shedding has been particularly pronounced in manufacturing and one obvious explanation is rationalisation, driven by increasing international competition and technological progress. Secondly, the effects of the property-related financial crises are clearly evident in Finland, Norway and Sweden, as employment in construction fell steeply and, in Finland, financial institutions have also cut employment.[33] The fall in construction came to a halt in 1994 in Norway and in 1995 in Sweden. In Finland, the slump in the construction continued until 1996 as did the decline in real house prices. Moreover, despite lower interest rates, "negative equity", together with tighter collateral requirements, many households in Finland have been forced to move to rented dwellings.

A third feature of the last decade has been that, in contrast to earlier years, the private services sectors were no longer able to absorb redundant workers from industry. Moreover, because of the need for fiscal consolidation, public employment has grown own only moderately or even fallen, so that total employment declined in Denmark, Finland and Sweden. Norway and Iceland, on the other hand, witnessed an expansion of total employment by continuing to rely on the public sector.[34] Total employment also grew in the United States but, in contrast to Norway and Iceland, this was mostly due to rapid employment growth in private services although public employment expanded as well. Developments in Germany are also worth noting as total employment fell due to cutbacks in industry but employment in private services increased.

[32] In the 1990s, all the countries have adopted new laws and regulations aimed at strengthening competition in output markets and public enterprises are being privatised. However, most of these measures are of a rather recent date and, given the long lags typical of supply-side policies, will mostly affect future developments. For details, see the latest OECD country surveys.

[33] Rather surprisingly, employment by Swedish financial institutions has continued to expand despite the banking crisis.

[34] As pointed out by the OECD, Norway may actually need a higher degree of flexibility in private services than the other countries, due to foreign revenue from the oil sector and associated upward pressures on the nominal and real exchange rate. So far, however, Norway has "escaped" this dilemma by keeping the exchange rate relatively stable and preventing excess labour supply via fiscal policy.

Table 11

Employment and output changes by sector

Cumulative percentage changes, 1985–95[1]

Sectors[2]	Denmark		Norway[3]		Iceland		Finland		Sweden		*United States*		*Germany*	
	Output	Empl.	Output	Empl.	Output	Empl.	Output	Empl.	Output	Empl.	*Output*	*Empl.*	*Output*	*Empl.*
Manufacturing	4.0	–6.1	0.8	–13.0	–4.0	–23.5	37.4	–25.2	12.9	–22.6	*20.3*	*–3.6*	*8.3*	*–15.0*
Construction	–4.1	0.0	6.9	–21.2	5.6	–10.0	–17.7	–33.3	–4.6	–21.3	*–2.2*	*10.2*	*23.3*	*19.5*
Trade and restaurants	14.1	1.5	16.3	0.6	11.8	– 1.2	– 1.7	–18.8	21.9	– 4.7	*24.2*	*14.2*	*33.2*	*15.0*
Transport and commun.	79.6	–0.7	46.5	– 5.7	25.2	– 0.5	43.9	–10.8	44.0	– 6.5	*39.1*	*18.9*	*50.5*	*– 0.8*
Finance	11.8	14.7	12.9	25.0	18.9	27.3	26.9	9.9	22.3	28.9	*22.2*	*34.3*	*43.5*	*20.5*
Financial institutions	5.9	3.2	n.a.	n.a.	20.1	6.8	– 8.9	–30.8	39.7	12.2	*25.8*	*12.5*	*51.8*	*n.a.*
Other services	17.2	10.2	9.9	6.4	18.3	14.0	6.8	–20.0	12.2	12.9	*22.1*	*38.5*	*n.a.*	*n.a.*
Private sector	22.2	–2.0	32.5	– 5.5	12.5	– 2.5	18.6	–21.7	16.2	– 6.0	*21.5*	*16.7*	*34.3*	*6.7*
Public sector	8.8	3.0	26.0	20.5	41.1	22.3	6.4	4.5	0.8	– 9.1	*10.8*	*11.7*	*11.3*	*– 2.4*
Total	19.4	–0.4	31.5	1.0	19.6	1.5	16.3	–16.6	12.5	– 7.1	*23.9*	*15.9*	*31.3*	*5.4*

[1] Exceptions: Denmark, employment in financial institutions, 1985–92; Iceland, sectoral output, 1985–93, total output and sectoral and total employment 1985–94; Sweden, 1985–94; and the United States, sectoral output 1985–93, total output and sectoral and total employment 1985–94. For Germany, 1985–91 refers to western Germany only. [2] Trade and restaurants: wholesale and retail trade, restaurants and hotels; Transport and commun.: transport, storage and communication; Finance: financial institutions, insurance, real estate and other business services; Financial institutions: bank and non-bank financial institutions; Other services: mostly community services. [3] Due to definitional changes, the figures for Norway are tentative.

Sources: OECD, *National Accounts*, Volume II, OECD, *Country Surveys*, various years and national data.

Table 12
Employment in wholesale and retail trade
Regression equations

Countries	Trend	d Cons.	d Em_{-1}	R^2	S.E.	Period	E-ratio	W-ratio
Denmark	−0.8	0.31	0.44	0.61	1.05	1968–95	0.19	0.95
Norway	−0.6	0.38	0.48	0.77	1.22	1964–94	0.23	0.72
Iceland	−0.0	0.33	0.41	0.50	2.95	1965–93	0.19	0.85
Finland	−1.9	0.76	0.27	0.62	2.30	1962–95	0.19	0.79
Sweden	−0.5[1]	0.39[2]	0.37	0.36	1.90	1975–94	0.21	0.87
Memo:								
United States . .	*−1.0*	*0.66*	*0.48*	*0.55*	*1.25*	*1962–93*	*0.26*	*0.60*
Germany	*−0.6*	*0.52*	*0.56*	*0.89*	*0.50*	*1979–95*	*0.20*	*0.60*

Notation: The employment equation is estimated on annual data and specified as: d log *Em* = α + d log *Cons* + d log Em_{-1}, where *Em* = employment in wholesale and retail trade, restaurants and hotels, *Cons* = private consumption in constant prices.

[1] Indicates that the coefficient is not statistically significant. [2] Lagged change in consumption; E-ratio is the ratio (1985) of employment in wholesale and retail trade to total private sector employment and W-ratio the ratio (1985) between compensation per employee in, respectively, wholesale and retail trade and manufacturing.

Whether the inability of private services, notably in Finland and Sweden, to absorb the redundant resources is attributable to the slump in domestic demand or to structural rigidities, is difficult to say. However, given their weight in total private employment, developments in wholesale and retail trade could be of particular interest in attempting to answer this question. One further striking feature of sectoral employment changes since 1985 is the almost 20% decline of employment in wholesale and retail trade in Finland. This, however cannot be attributed to lack of flexibility; on the contrary, an unusually large elasticity of employment with respect to private consumption, combined with the slump in the domestic economy in the 1990s, seems to have been the main influence.[35] An additional factor, which could also explain the

[35] According to the estimates in Table 12, the 11% decline in private consumption between 1989 and 1993 would account for about one-half of the overall decline in employment in wholesale and retail trade since 1985. While the estimated equation points to a relatively high degree of flexibility in Finland and explains the huge decline in the 1990s quite well, the very high correlation between consumption and employment may be spurious and excessively influenced by the steep decline of both variables in the early 1990s. The large negative trend term could also mean that certain asymmetries or threshold effects exist. Thus consumption has to grow by at least 2% per year, before employment reacts. Moreover, according to the OECD, product markets in general are regulated in Finland with disincentives for the establishment of small to medium-sized firms.

employment fall in other private services, is the fact that debt ratios for non-manufacturing firms and households have remained high compared with the early to mid-1980s. In contrast, debt ratios in the manufacturing sector have been substantially reduced.

The story for Sweden, where employment in wholesale and retail trade has also declined, is a different one although, as in Finland, compensation per employees has declined relative to manufacturing since 1985. The rather low and slow response to changes in private consumption (Table 12) is suggestive of a non-competitive market and the poor performance of this sector is not so much the result of the 4% decline in consumption between 1989 and 1993 but rather of the low response to the 18% rise in consumption during the 1980s. The estimates for Denmark and Iceland, combined with relatively high wage costs in the wholesale and retail trade sector, are also indicative of regulated and non-competitive markets, whereas the consumption elasticity is somewhat higher and the relatively wage level considerably lower in the case of Norway. However, for all the Nordic countries the employment performance of wholesale and retail trade has been significantly weaker than that of the United States where relative wage costs are much lower. Germany has also performed substantially better than the Nordic countries in this respect, even though wholesale and retail trade is usually regarded as severely constrained by regulations.[36]

Concluding observations

In his introduction to an earlier volume on wage formation and macroeconomic policy in the Nordic countries, Calmfors (1990) summarised the then existing prominent issues as follows (pp. 11–12):

"Developments in the Nordic countries from the late seventies onwards can best be seen as a prolonged attempt to adjust the real wage trend to lower productivity growth and to improve international competitiveness. On the whole these attempts proved successful in the late seventies and early eighties but

[36] Even though German wages in wholesale and retail trade are high by international standards, they are low relative to those of manufacturing and consistent with the ratios of output per man-hour in the two sectors.

higher money wage growth than abroad now threatens these achievements again".

To some extent wage adjustment has remained the key issue in the 1990s except that the major shifts to which nominal wages have to adjust are no longer low productivity growth but low inflation and the absence of the public sector as an employer of last resort. The changes required to facilitate these adjustments are mainly two: more flexible relative wages and more competitive product markets, notably in the sheltered private services sector.

As noted in Section 3, several analysts have pointed to the apparent decline of real wage flexibility following the reduction of price inflation to the 2–3% range. It is tempting to attribute this to a high degree of nominal rigidity in wage setting, but there is little empirical evidence to support the view that nominal rigidities in the Nordic countries are higher than elsewhere.[37] In contrast, there is clear evidence that relative wages are less flexible than in most other countries and mainly due to the high priority attached to social equity. This priority seems to be shared by policy makers, trade unions and employers and will probably only change slowly. However, particularly in a period when rapid technological progress and increasing international competition imply a need for reallocating resources it is important that rigidities in wage setting do not resist or retard this process. Moreover, fast employment growth, unimpeded by rigidities, is frequently the most efficient and least costly way of maintaining social equity.

The need and the efforts made to reduce fiscal imbalances have, with the exception of Norway and Iceland, put an end to the earlier practice of equalising demand and supply in the labour market via adjustments in public sector employment. Since the exposed sector has to remain competitive, it is unlikely to become a major source of future jobs; in fact, further rationalisation efforts and downsizing are more likely. Consequently, it is crucial that the private services sector increases its capacity to create jobs and this, in turn, requires a more competitive environment. All the countries have recently adopted laws promoting competition but how effective these will be remains to be seen. Other reforms, notably in the area of employment protection, also need to be considered as underlined in recent OECD country surveys.

[37] On the contrary, Anderton (1997) found that the persistence of inflation is relatively low.

At a first glance, it might appear difficult (or even contradictory) to allow more scope for wider wage dispersions while, at the same time, lowering nominal wage claims; in fact, it cannot be excluded that, initially, policy-makers may be facing a trade-off. However, other countries have solved this problem and some of the solutions may also be applicable to the Nordic countries.[38]

What can monetary policy do to ease labour market and wage adjustments? Central banks can, for obvious reasons, not act as employers of last resort, nor can monetary policy do much to raise long-run output growth. However, precisely since the reconciliation of nominal wage claims and low price inflation is a *nominal* and not a *real* problem, Central banks can help the adjustment process by being transparent with respect to policy targets and the implementation of policies. As discussed in the companion paper, two of the Nordic countries have adopted low inflation as their principal targets while the others rely on fixed nominal exchange rates vis-à-vis the currencies of countries with low inflation as their nominal anchor. Thus trade unions and employers have received the message that low inflation is there to stay; what is still missing is that the private agents adjust their claims to the message.

[38] For instance, under the previous Accord in Australia, enterprise bargaining based on firm-specific productivity gains, was promoted while the general trade union organisation (ACTU) was held responsible for respecting the inflation target adopted by the Reserve Bank.

Annex

Annex Table 1

Structural unemployment: unemployment – output gap*

Countries	Gap	Trend	Trend^2	Dum	R^2	S.E.	DW
Denmark .	−0.54	1.52	−0.025	–	0.94	0.81	1.70
Norway . .	−0.31	0.49	−0.007	–	0.92	0.40	1.54
Iceland . . .	−0.17	0.18	–	−1.05	0.96	0.30	1.52
Finland . . .	−0.70	0.38	–	2.80	0.97	0.92	1.50
Sweden . .	−0.51	0.18	–	1.80	0.94	0.51	1.98

Notation: R^2 = coefficient of determination; S.E. = standard error of estimate; DW = Durbin-Watson statistic; all coefficients are significant (99%); intercept terms not shown.

* The estimated equations were specified as follows: $Un = \alpha + \beta\ Gap_{-1} + \chi\ Trend + \epsilon\ Trend^2 + \phi\ Dum$, where *Un* = rate of unemployment; *Gap* = GDP gap; *Trend* = linear trend; *Dum* = dummy variable: for Finland and Sweden, 1 for 1971–77 and 1991–96 and otherwise 0; for Iceland, 1 for 1983–92 and otherwise 0.

Annex Table 2

Structural unemployment: unemployment – external balance*

Countries	Un	Un_{-1}	Rex_{-1}	Int_{us}	dy_{oecd}	doil	Tot	R^2	S.E.	DW
Denmark .	1.25	−0.43	−0.13	−1.00	0.16	–	–	0.85	1.22	1.56
Norway . .	–	2.54	−0.20	–	0.27	0.48	–	0.84	2.07	1.60
Iceland . .	0.61	–	–	–	0.11	−0.10	0.12	0.48	1.24	1.42
Finland . .	–	0.36	−0.06	–	0.70	–	–	0.84	1.34	1.57
Sweden . .	–	0.43	−0.04	–	0.57	−0.03	–	0.81	0.93	1.97

* The estimated equations were specified as follows: $Bop = \alpha\ Un + \beta\ Un_{-1} + \chi\ Rex_{-1} + \epsilon\ Int_{us} + \phi\ dy_{oecd} + \gamma\ doil + \lambda\ Tot + \eta\ Dum$, where *Bop* = current balance of payments as a percentage of GDP; *Un* = rate of unemployment; *Rex* = real effective exchange rate, based on unit labour costs (for Denmark, current first difference); Int_{us} = US long-term interest rate; dy_{oecd} = percentage change in GDP, average for OECD countries (for Denmark, Norway and Iceland less percentage change in domestic demand); *doil* = percentage change in price of oil (for Norway and Iceland the level of oil prices); and *Tot* = terms of trade. Estimates for Finland also include dummy variable (–1 for 1981 and 1 for 1989–90 and otherwise 0) with a coefficient of −2.75. All coefficients are stastically significant (95 or 99%) and all equations were estimated with the intercept term suppressed.

Annex Table 3

Structural unemployment: wage equations[1]

Countries	dpc	dpc_{-1}	dw_{-1}	Un	Un_{-1}	dq	R^2	S.E.	DW	F-test
Denmark . .	0.62	–	0.15	–	−1.53	0.24	0.85	1.51	0.28	–
	0.71	–	0.29	–	−1.03	0.30	0.51	1.62	1.75	6.35*
Norway . . .	0.62	–	0.16	– 2.88	–	0.30	0.78	1.83	0.49	–
	0.77	–	0.23	– 2.13	–	0.45	0.47	1.87	1.85	2.44**
Iceland . . .	0.67	–	0.08	−11.40	8.19	0.62	0.87	7.27	−0.10	–
	0.73	–	0.27	– 6.89	6.89	1.15	0.49	7.75	2.12	3.69*
Finland . . .	0.92	−0.33	0.35	– 4.48	3.03	0.13	0.83	2.23	−0.03	–
	1.00	−0.36	0.36	– 4.36	3.05	0.17	0.47	2.17	2.16	0.32**
Sweden . . .	0.53	−0.28	0.42	– 4.47	3.16	–	0.67	1.88	0.00	–
	0.64	−0.31	0.67	– 4.71	4.71	–	0.51	2.01	2.04	2.77*
Memo:										
United States	*0.51*	*−0.23*	*0.31*	*– 2.18*	*–*	*0.45*	*0.84*	*0.80*	*−0.94*	
	0.51	*−0.20*	*0.29*	*– 1.98*	*–*	*0.43*	*0.59*	*0.79*	*2.09*	*2.25***
Germany[2] . .	*0.71*	*–*	*0.16*	*– 3.87*	*−2.40*	*0.26*	*0.85*	*1.64*	*0.70*	
. . . . .	*0.81*	*–*	*0.19*	*– 4.00*	*−2.69*	*0.31*	*0.87*	*1.62*	*1.91*	*0.35***

[1] Wage equations estimated as: $dw = \phi + \varphi\ dpc + (1 - \varphi - \eta)\ dpc_{-1} + \eta\ dw_{-1} + \beta\ Un + \beta\alpha\ Un_{-1} + \kappa\ dq$, where *dw* = percentage change in compensation per employee; *dpc* = percentage change in consumer prices; *Un* = rate of unemployment in logs and *dq* = rate of productivity growth, total economy. * Homogeneity condition rejected at 95%, but not at 99%. ** Homogeneity condition not rejected at either 95 or 99%. For equations including the lagged dependent variable, Durbin's h-statistic rather than the DW-statistic is shown. [2] Includes a dummy variable for 1991–92 (−0.5, 1).

Annex Table 4

Consumer price equations[1]

Countries	Gap	Gap_{-1}	dulc	dpc_{-1}	dpm	R^2	S.E.	DW	F-test
Denmark . .	0.23	–	0.23	0.44	0.17	0.94	0.99	0.98	–
	0.23	–	0.29	0.57	0.14	0.66	1.12	1.69	0.92**
Norway . . .	–	–	0.39	0.33	0.16	0.81	1.34	–1.11	–
	–	–	0.40	0.43	0.17	0.59	1.36	2.45	2.24**
Iceland . . .	0.25	–	0.29	0.18	0.51	0.95	4.18	–0.65	–
	0.23	–	0.30	0.19	0.51	0.91	4.11	2.22	0.14**
Finland . . .	–	0.14	0.15	0.50	0.21	0.97	0.89	0.77	–
	–	0.09	0.15	0.63	0.22	0.82	1.07	1.46	7.81*
Sweden . . .	–	0.13	0.31	0.41	0.13	0.76	1.67	–1.77	–
	–	0.05	0.37	0.50	0.13	0.59	1.69	2.58	1.97**
Memo:									
United States[2]	–	*0.21*	*0.41*	*0.37*	*0.06*	*0.95*	*0.54*	*–0.14*	
	–	*0.24*	*0.56*	*0.40*	*0.04*	*0.83*	*0.59*	*2.00*	*6.65***
Germany[3] . .	*0.22*	–	*0.15*	*0.62*	*0.08*	*0.85*	*0.71*	*1.00*	
	0.24	–	*0.17*	*0.76*	*0.07*	*0.60*	*0.75*	*1.57*	*4.05***

[1] Consumer prices equation estimated as: $dpc = \nu + \delta_1 Gap + \delta_2 Gap_{-1} + \mu\ dulc + \lambda\ dpc_{-1} + \omega\ dpm$, where *dpc* = changes in consumer prices, *Gap* = output gap, *dulc* = changes in unit labour costs (for the United States, changes in compensation per employee), *dpm* = changes in import prices. Lags of *dulc*, and *dpm* were also included but, except for the United States were not significant. * Homogeneity condition rejected at 95%, but not at 99%. ** Homogeneity condition not rejected at either 95 or 99%. For equations including the lagged dependent variable, Durbin's h-statistic rather than the DW-statistic is shown. [2] Coefficient with respect *dulc* is the sum of coefficients with respect the current and 2-year lagged changes in compensation per employee and that with respect to *dpm* the sum of coefficients with respect to current and 1-year lagged values. Equation also includes a dummy variable for the price and wage controls in the early 1970s. [3] Equation also includes a dummy variable for 1991–92 (–0.5, 1).

Annex Table 5

Employment adjustment equations*

Countries	dy	dy_{-1}	drw	drw_{-1}	dem_{-1}	R^2	S.E.	DW
Denmark . . .	0.36	0.29	−0.16	−0.20	0.00	0.68	0.75	1.90
Norway . . .	0.29	0.21	−0.07	−0.04	0.48	0.57	0.94	0.90
Iceland	0.49	–	−0.07	−0.03	0.00	0.39	1.63	2.03
Finland	0.30	0.39	−0.03	−0.08	0.00	0.67	1.36	1.17
Sweden	0.45	–	−0.18	–	0.52	0.55	1.10	0.65
Memo:								
United States .	*0.51*	*0.23*	*−0.25*	*−0.19*	*0.00*	*0.70*	*0.70*	*1.60*
Germany . . .	*0.45*	–	*−0.14*	–	*0.38*	*0.63*	*0.83*	*1.90*

* Employment adjustment equation estimated as: $dem = \xi + \pi_1\, dy + \pi_2\, dy_{-1} + \sigma_1\, drw + \sigma_2\, drw_{-1} + \rho\, dem_{-1}$, where *dem* = changes in employment, *dy* = change in real output (GDP), *drw* = changes in real labour costs. For equations including the lagged dependent variable, Durbin's h-statistic rather than the DW-statistic is shown.

Annex Table 6

Unemployment: testing hysteresis*

Annual data, 1962–96

Countries	Constant	Un_{-1}	Un_{-2}	R^2	H-stat.	F-test
Denmark . .	0.44	1.31	−0.36	0.94	0.54	1.82
Norway . . .	0.28	1.40	−0.49	0.91	2.28	2.94
Iceland	0.17	1.33	−0.44	0.86	0.75	1.78
Finland	0.63	1.66	−0.76	0.94	3.57	4.58
Sweden . . .	0.34	1.50	−0.59	0.90	0.89	1.52
Memo:						
United States .	*1.66*	*1.04*	*−0.32*	*0.65*	*3.18*	*6.63*
Germany . . .	*0.23*	*1.45*	*−0.46*	*0.96*	*2.82*	*0.25*

* Equation estimated as: $Un = \alpha + \beta\, Un_{-1} + \chi\, Un_{-2}$, where *Un* = rate of unemployment. The last column tests the hypothesis that $\beta + \chi = 1$; critical values for rejection: 4.15 (95%) and 7.50 (99%).

Bibliography

Anderton, R. (1997): "Did the underlying behaviour of inflation change in the 1980s? A study of 17 countries". *Weltwirtschaftliches Archiv*, pp. 22–38.

Agell, J. (1996): "Why Sweden's Welfare State needed Reform". *Economic Journal*, pp. 1,760–71.

Bäckström, U. (1997): "Monetary policy and unemployment in Sweden". *Speech before the Swedish Economic Association,* March.

Bean, C. (1994): "European unemployment: a survey". *Journal of Economic Literature*, pp. 573–619.

Bianchi, M. and G. Zoega (1997): "Challenges facing natural rate theory". Birkbeck College *Discussion Paper in Economics*, no. 6/97.

Calmfors, L. (1990): "Wage formation and macroeconomic policies in the Nordic countries: a summary" in L. Calmfors (ed.), *Wage Formation and Macroeconomic Policy in the Nordic Countries*, pp. 11–60.

Calmfors, L. (1993): "Centralisation of Wage Bargaining and Macroeconomic Performance: A Survey". OECD *Working Paper*, no. 131.

Franks, J. (1997): "Labour market policies and unemployment dynamics in Spain". Bank of Spain *Working Paper*, no. 9708.

Gudmundsson, M. (1994): "In search of stability: Iceland's exchange rate and monetary policies". *Economic and Financial Review*, pp. 123–52.

Gylfason, T. (1997): "Okun's Law and labour market rigidity: the case of Sweden". SNS *Occasional Paper,* no. 79.

Henrekson, M., L. Jonung and J. Stymne (1997): "Economic growth and the Swedish model", in N. Crafts and G. Toniolo (eds.), *Economic Growth in Europe since 1945*, pp. 240–89.

Henry, S. G. B. and D. J. Snower (1996): "The Dynamics of European Unemployment", in Henry and Snower (eds.), *Economic Policies and Unemployment Dynamics in Europe*, IMF, pp. 2–38.

Holden, S. (1996): "The Unemployment Problem: A Norwegian Perspective". OECD *Working Paper*, no. 172.

Martins, J. O., S. Scarpetta and D. Pilat (1996): "Mark-up ratios in manufacturing industries". OECD *Working Paper*, no. 162.

OECD (various years): *Economic Surveys*, Denmark, Norway, Iceland, Finland and Sweden.

OECD (1996): "The NAIRU: Concept, Measurement and Policy Implications", Working Party no. 1 of the Economic Policy Committee.

OECD (1997): *Implementing the OECD Jobs Strategy: Lessons from Member Countries' Experience,* Paris.

Stiglitz, J. (1997): "Reflections on the Natural Rate Hypothesis". *Journal of Economic Perspectives*, pp. 3–10.