ADJUSTMENT PERFORMANCE
OF OPEN ECONOMIES:
SOME INTERNATIONAL COMPARISONS

by
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ADJUSTMENT PERFORMANCE OF OPEN ECONOMIES: SOME INTERNATIONAL COMPARISONS*

Introduction

The adjustment problems of small open economies have been a focal point of analysis for many years. Up to the early 1970s discussion proceeded against a background of international developments dominated by demand shocks, which often originated in divergent and over-ambitious demand management policies and ultimately led to breakdown of the Bretton Woods régime. Thereafter, attention shifted as the world economy became subject mainly to supply shocks, including the commodity boom of 1972–73, the two oil shocks, large fluctuations in real and nominal exchange rates and, in the early 1980s, the emergence of unusually high interest rates internationally. Whereas in the first period demand disturbances from abroad had affected inflation and unemployment in opposite directions, the second period brought an increase in inflationary pressures and a rise in unemployment at the same time.

These developments, of course, greatly complicated the task of formulating satisfactory adjustment policies, raising in particular the question of how, and at what speed, to respond to supply shocks. It may be observed that the change in underlying supply conditions was a gradual process which began during the second half of the 1960s, though the implications for and constraints on policy formation were less dramatic than in the case of the international price shocks in the early 1970s and were initially recognised in only a

few countries. The change may be attributed to both a gradual build-up of inflationary expectations and a slowing-down of productivity growth. It can, therefore, also be interpreted as a "supply side" phenomenon and probably lies behind the steepening slope of the price-output curves evidenced in practically all the industrial countries during the post-war period (see Graph 2).

Two further developments which have strongly conditioned policy formation in small open economies have been the generalised move to more flexible exchange rates in the early 1970s and the subsequent adoption in some major countries of targets for the growth of the monetary aggregates. In this environment, and given their openness both as price-takers and in regard to capital movements, small open economies have, with certain exceptions, generally preferred to fix their currencies in relation to that of some larger trading partner rather than to adopt a monetary target. Although the hard-currency option tends to provide a stabilisation pivot for their policies, it may also set constraints that are at times too stringent for the country to cope with.

The stylised model of the small open economy has been the subject of a great deal of theoretical analysis. At the empirical level, of course, there are important differences in the economic position and policy experience of individual countries. At least four differences seem to be of major importance: degree of openness, vulnerability to particular kinds of external shocks, institutional factors and policy responses. Obviously, it is of considerable potential interest to compare the experience of different countries with a view to learning the lessons of developments over the past fifteen years. In particular, it is useful to see to what extent rigidities – due to institutional factors, behavioural patterns or past policy measures – have influenced the adjustment process and thereby either hampered or facilitated the implementation of effective policies. We have chosen for this purpose four countries: Austria, Belgium, Canada and Sweden – a more or less random selection of open economies whose experience, though similar in some respects, has differed widely in others.

I.
Overview

A. General performance indicators

Some overall economic indicators and a general "performance index" are shown in Table 1 for sixteen industrial countries, and in Table 2 these same countries have been "ranked" according to the same criteria.* In order to assess how well countries have adjusted to the obstacles encountered during the 1970s two points are worth further consideration: indices and rankings for the period 1973–80 and changes in the overall performance between the early 1960s and the late 1970s.

As regards the 1970s four groups of countries may be identified:

– a first group with a general performance index better than −5 and comprising Austria, Germany, the Netherlands and Switzerland. As can be seen from Table 2, a high rank in terms of inflation is a predominant feature of this group, and except for Austria they tend to have surpluses on external account. The growth performance is mixed, with Switzerland in fact occupying the lowest rank, while Austria is among the three countries with the highest growth rate. The group used to include Belgium, which, however, has recently experienced a worsening of inflation and of its external position;

– a second group with a general performance between −5 and −10 and comprising Belgium, France, Canada, Japan and the United States. Although the OECD average is also found in this

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* In constructing the general performance index the indicators were, somewhat arbitrarily, assigned equal weights, and average GNP growth was preferred to average rates of unemployment as the latter are difficult to compare internationally. It might be noted, however, that in the 1970s unemployment rates in the United States and Canada were strongly influenced by fast labour supply growth, while in Japan, Switzerland, Sweden, Austria and Norway unemployment remained low relative to the trend in output growth owing to special employment measures, migration and/or large cuts in average working hours.

Table 1

General performance indicators*

Countries	1960–67				1967–73				1973–80				"Performance index" GNP + BOP/GNP – Prices			
	Prices	Un-employ-ment	GNP	BOP/GNP	Prices	Un-employ-ment	GNP	BOP/GNP	Prices	Un-employ-ment	GNP	BOP/GNP	1960–67	1967–73	1973–80	1960–67 to 1973–80
Austria	3.5	2.0	4.3	0.3	4.7	1.5	5.7	0.1	6.4	1.6	3.0	–1.6	1.1	1.1	– 5.0	– 6.1
Belgium . . .	3.3	2.1	4.6	0.1	4.1	2.2	5.4	1.9	7.7	5.7	2.4	–1.7	1.4	3.2	– 7.0	– 8.4
Denmark . . .	5.5	1.7	4.7	–1.7	7.8	1.0	4.0	–2.2	10.6	5.3	1.6	–3.5	–2.5	–6.0	–12.5	–10.0
Finland	5.0	1.4	4.1	–1.6	6.9	2.6	6.0	–1.3	12.2	4.6	2.7	–2.7	–2.5	–2.2	–12.2	– 9.7
Netherlands .	4.0	0.6	4.6	0.6	6.5	1.6	5.5	0.7	7.3	4.1	2.2	0.8	1.2	–0.3	– 4.3	– 5.5
Norway	3.9	1.0	4.7	–2.5	6.2	1.1	3.8	–1.2	8.8	1.8	4.7	–6.4	–1.7	–3.6	–10.5	– 8.8
Sweden	4.0	1.5	4.5	–0.1	5.4	2.2	3.6	0.4	10.3	1.9	1.8	–1.8	0.4	–1.4	–10.3	–10.7
Switzerland .	4.1	–	4.5	–1.4	5.5	–	4.3	1.4	4.2	–	0.3	3.5	–1.0	0.2	– 0.4	0.6
Australia . . .	2.3	1.9	4.9	–2.3	5.5	2.0	5.4	–1.4	12.0	5.2	2.5	–2.2	0.3	–1.5	–11.7	–12.0
Canada	1.9	4.9	5.6	–1.8	4.2	5.1	5.6	–0.3	9.1	7.2	2.8	–2.0	1.9	1.1	– 8.3	–10.2
Germany . . .	3.0	0.7	3.9	0.3	4.2	1.0	5.3	1.2	4.7	3.5	2.3	0.6	1.2	2.3	– 1.8	– 3.0
France	3.6	1.2	5.5	0.6	5.9	2.4	5.6	–0.1	10.7	4.8	2.8	–0.8	2.5	–0.4	– 8.7	–11.2
Italy	4.1	4.9	5.6	1.3	5.6	5.6	5.0	1.6	17.6	6.7	2.8	–0.5	2.8	1.0	–15.3	–18.1
Japan	5.6	1.3	10.2	–0.1	6.7	1.2	9.5	1.1	9.1	1.9	3.7	0.1	4.5	3.9	– 5.3	– 9.8
United Kingdom .	3.4	1.4	2.9	–0.2	6.6	2.4	3.4	0.0	15.6	4.7	0.9	–0.8	–0.7	–3.2	–15.5	–14.8
United States .	1.8	5.1	4.6	0.7	4.5	4.5	3.6	0.1	7.9	6.8	2.3	0.1	3.5	–0.8	– 5.5	– 9.0
OECD average . .	2.7	3.1	5.1	0.3	5.1	3.4	4.9	0.3	10.2	5.4	2.5	–0.4	2.7	0.1	– 8.1	–10.8

* Prices = percentage change in private consumption deflator. GNP = percentage change in real GNP/GDP. Unemployment = percentage rate of unemployment, national definitions. BOP/GNP = balance of payments on current account as a percentage of GNP. Annual averages.

Source: *Historical Statistics*, OECD, Paris, 1982

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range, it is hard to generalise about this group, as it is very heterogeneous with respect to both country composition and developments in individual indicators;

   – a third group with a general performance between −10 and −15 and made up of the three Scandinavian countries, Finland and Australia. A general feature of this group is high inflation and relatively large external deficits. Except in the case of Norway growth has not been particularly high, but unemployment is in all countries below the OECD average and is very low in Norway and Sweden;

   – a fourth group with a general performance of −15 or worse and comprising Italy and the United Kingdom. In both countries the inflation performance has been poor, and the United Kingdom also occupies one of the lowest ranks with respect to real growth.

   As regards changes in overall performance between the early 1960s and the late 1970s all countries except Switzerland have experienced a worsening. The deterioration has been relatively moderate in the case of the countries in the first group, suggesting – on the basis of the criteria used here – that these countries have adjusted comparatively smoothly to a more difficult environment. The largest declines are recorded for Italy and the United Kingdom, but Australia is also below the OECD average, while France, Canada and Sweden are placed near the average. As might be expected, some of these changes have caused rank shifts and over the period considered, Italy has dropped from third to fifteenth place while Switzerland has moved from thirteenth to first place. Other members of the first group have also improved their rankings while, with the exception of Belgium, the countries in the second group have seen their ranks decline by 3 points or more.

   The rank correlation between different sub-periods is relatively high and positive for the overall index, while it is low and insignificant for inflation, suggesting that it is mainly in the latter area that deviations from past behaviour have occurred. There is a negative correlation between inflation and real growth for each of the three sub-periods, but this relationship is not statistically

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Table 2
Performance rankings

Countries	Prices			GNP			Index		
	1960–67	1967–73	1973–80	1960–67	1967–73	1973–80	1960–67	1967–73	1973–80
Austria	7	5	3	13	3	3	9	4	4
Belgium	5	1	5	8	7	9	6	2	7
Denmark	15	16	11	6	12	14	15	16	14
Finland	14	15	14	14	2	7	15	13	13
Netherlands ...	10	12	4	8	6	12	7	8	3
Norway	9	11	7	6	13	1	14	15	11
Sweden	10	6	10	11	14	13	10	11	10
Switzerland	12	7	1	11	11	16	13	7	1
Australia	3	7	13	5	7	8	11	12	12
Canada	2	2	8	2	4	4	5	4	8
Germany	4	2	2	15	9	10	7	3	2
France	8	10	12	4	4	4	4	9	9
Italy	12	9	16	2	10	4	3	6	15
Japan	16	14	8	1	1	2	1	1	5
United Kingdom	6	13	15	16	16	15	12	14	16
United States ..	1	4	6	8	14	10	2	10	6
Rank correlation .	0.61 0.49			0.39 0.57			0.70 0.65		
	0.07			0.51			0.34		

Cross correlation: Prices/GNP: 1960–67: –0.11; 1967–73: –0.05; 1973–80: –0.14.

significant and (see the following section) a downward-sloping "international" Phillips curve only seems to exist for the early 1960s.

B. Inflation, unemployment and output

(a) *Inflation and unemployment:* Graph 1 shows average inflation and unemployment rates for the early 1960s and late 1970s. As is well known, both indicators have increased, but, in addition, there have been marked changes in individual countries' positions relative to the overall average.* In the first period, most countries are found in the NW-quadrant with above-average inflation rates and below-average unemployment rates. The United States and Canada are

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* The averages are weighted, which also explains why the regression line does not pass through the average point.

Graph 1

Inflation and unemployment
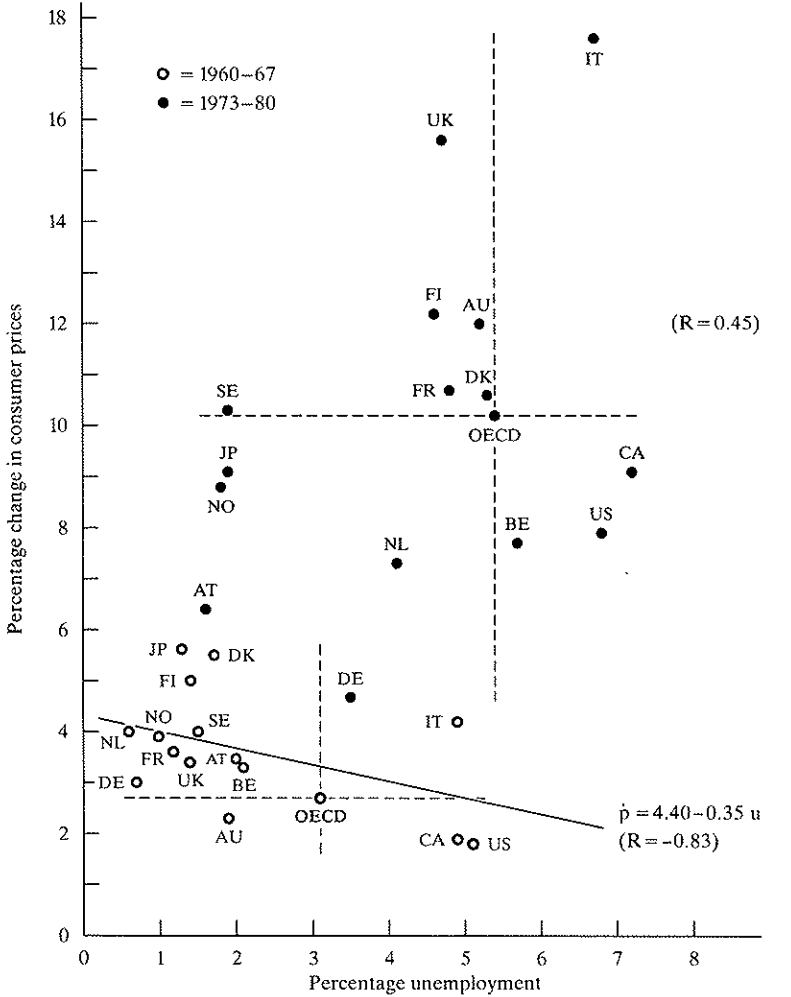
Note: AT = Austria   DE = Germany IT = Italy   SE = Sweden
      AU = Australia DK = Denmark JP = Japan   UK = United Kingdom
      BE = Belgium   FI = Finland   NL = Netherlands US = United States
      CA = Canada   FR = France   NO = Norway

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characterised by low inflation and high unemployment, while Australia and Italy are found in the "odd" quadrants with simultaneously low (high) inflation and unemployment rates. For this period a cross-country Phillips curve is relatively well determined with a negative slope of 0.35 and a correlation coefficient of almost −0.85. In the more recent period, however, this relationship breaks down and the correlation between inflation and unemployment is in fact positive. This is partly explained by the much larger deviations from the overall averages, but, in addition, a number of countries have moved from the NW-quadrant to the SW-quadrant with below-average inflation and unemployment rates. All the countries in the first group are found in this quadrant,[1] while Belgium has joined the North American countries. Sweden has remained among the countries with low unemployment and high inflation, and Italy is still the only country in the NE-quadrant. However, Australia is close to entering this region, whereas in the previous period it was the only country found to the south-west.

(b) *Inflation and output:* Many recent contributions to the discussion of macro-economic trade-offs and the choice of anti-inflationary policies have focused on the slope of the aggregate supply curve[2] in an attempt to determine the "split" of nominal income changes between price and output adjustments. Most of these studies have been expressed in rates of change, while the curves shown in Graph 2 "retreat one derivative" by plotting successive price and output *levels*. Although these curves do not directly measure the trade-offs nor identify causal relationships, they do convey the impression of a gradual worsening over time, and this is further illustrated in Table 3, which shows price/output elasticities for the sub-periods used in Tables 1 and 2. In several countries (and especially in some of the major ones) the deterioration did not start with the first oil price increase but was well under way in the late
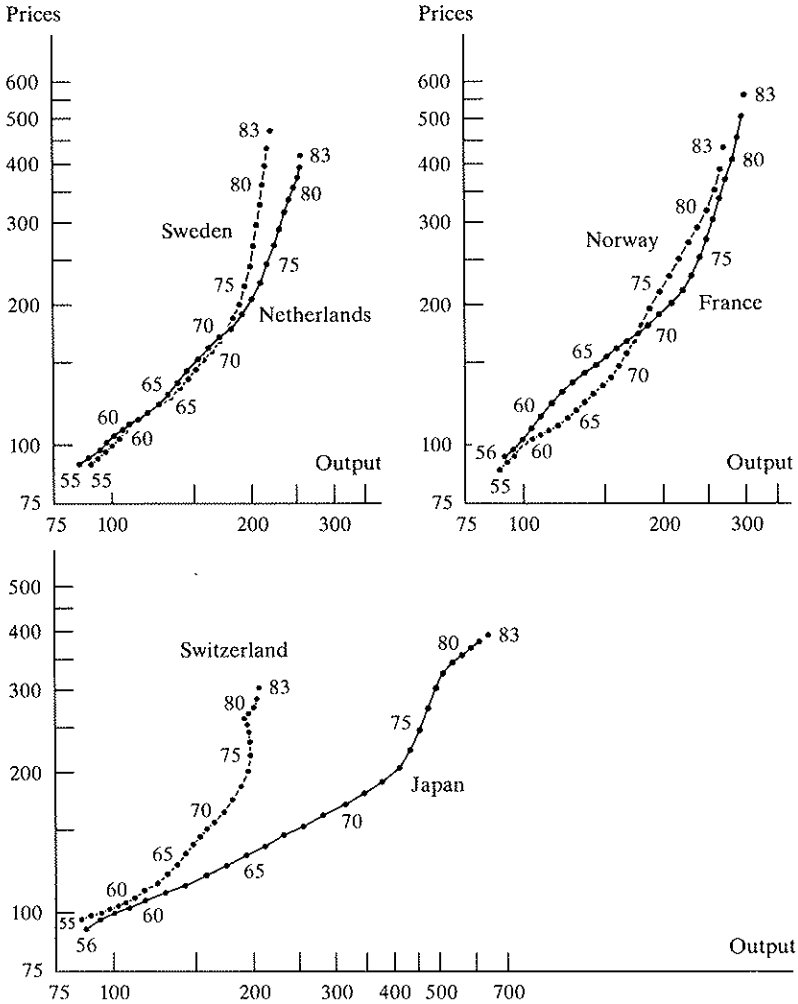
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[1] Switzerland is not shown in the graph but would clearly also be located in the SW-quadrant.

[2] See for instance Lucas (1972), Okun (1981), Gordon (1981), Schultze (1981) and OECD (1983).

Graph 2

Prices and output

Uncentred 5-year moving averages based on indices
for real GNP and GNP deflator
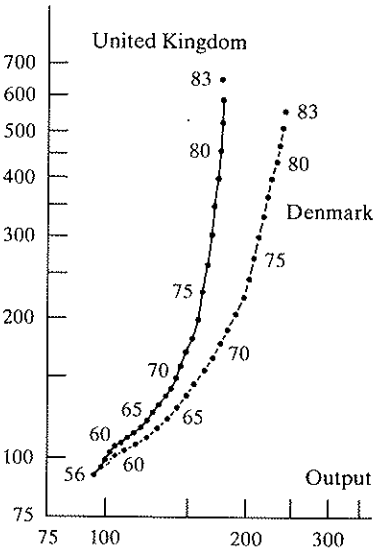(1956 = 100, logarithmic scale)

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Graph 2 (continued)

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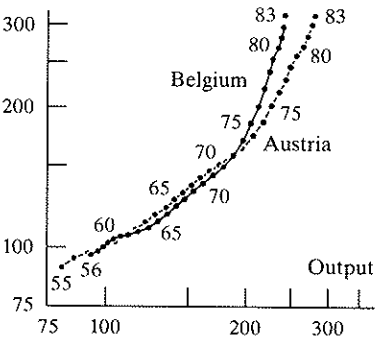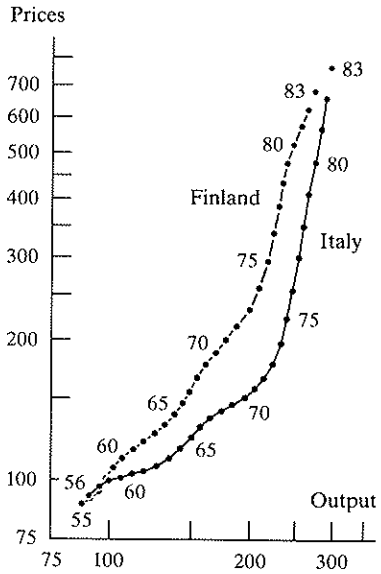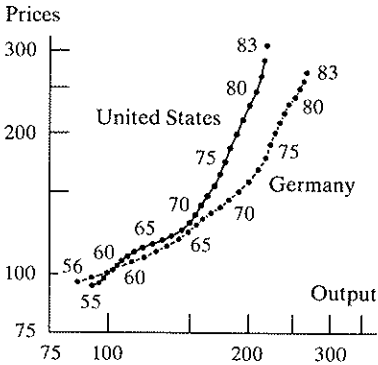
Table 3

Price/output elasticities*

Countries	1960–67	1967–73	1973–80
Austria	0.91	0.93	1.97
Belgium	0.72	0.93	3.08
Denmark	1.26	2.05	6.19
Finland	1.34	1.37	4.44
Netherlands	1.11	1.29	3.27
Norway	0.83	1.84	1.94
Sweden	0.98	1.53	5.89
Switzerland	1.04	1.44	12.00
Australia	0.49	1.18	4.76
Canada	0.45	0.88	3.61
Germany	0.85	1.00	2.04
France	0.71	1.07	3.82
Italy	0.81	1.24	6.28
Japan	0.51	0.69	1.92
United Kingdom	1.24	2.03	18.22
United States	0.43	1.39	3.34
OECD average	0.59	1.14	3.88

* Calculated as the ratio between relative price and output changes and equivalent to the slope of the curves in Graph 2 for the three sub-periods.

1960s. Moreover, when countries are evaluated on the basis of recent trends, the following country groupings may be derived and compared with those of the previous section:

— a first group with a price/output elasticity ≤ 2 would include Austria, Germany, Japan and Norway. In the first three countries the price/output curve was relatively flat until the early 1970s, and the improvement in the ranking of Norway compared with the previous section is largely due to the oil sector and to the exclusion of the balance of payments;

— a second group with an elasticity between 2 and 4 comprises Belgium, Canada, France, the Netherlands and the United States. Among these countries the United States and Canada have experienced the sharpest deterioration, and until 1973 the performance of Belgium and Canada was in line with that of Germany;

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– a third group, with a price/output elasticity between 4 and 10, includes Australia, Denmark, Finland, Italy and Sweden. The deterioration in the trade-off has occurred relatively late in Australia and Italy, while the Scandinavian countries and Finland have had rather unfavourable "splits" throughout the period;

– a fourth group embraces Switzerland and the United Kingdom, where the price/output elasticity exceeds 10. The fact that these two countries are grouped together underlines the shortcomings of this measure as a general performance indicator, although for most of the period considered Switzerland has shown an elasticity well above those of most EMS countries and Austria.

While the process of disinflation in 1982–83 has confirmed the impression of a generally unfavourable price/output split (at least in the short run), a more fundamental question concerns the underlying causes of the deterioration since the 1960s. Does this imply that supply conditions have deteriorated to the extent that a rise in nominal demand will only lead to more inflation, or do the curves as displayed in Graph 2 combine movements along average cost curves with shifts of these curves? In the space available it is not possible to analyse this question in any detail, but studies undertaken elsewhere would seem to support the second hypothesis, so that the steepening of the curves can be explained by a gradual build-up of inflationary expectations during the 1960s which, together with the external supply shocks of the 1970s, shifted the curves upwards and leftwards. In most countries the build-up of inflationary expectations during the 1960s was associated with a move along the shifting curves towards the more steeply rising part as full-employment policies were pursued and in some cases "overdone". On the other hand, in the 1970s – and particularly during the last few years of the decade – utilisation rates generally declined as restrictive policies were adopted in virtually all countries. Consequently, Graph 2 should not be taken to mean that an expansion of nominal demand in present conditions of widespread slack will only lead to more inflation and no output growth. On the other hand, changes in the shape of the curves over

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time do give some first impressions of the extent to which various countries have allowed inflationary expectations to build up and have been able (or unable) to absorb the external shocks in a non-inflationary way.

II.
Economic developments in Austria, Belgium, Canada and Sweden

A. Some general features

From the general trends and performance evaluations given above, four countries have been selected for further analysis:

– *Austria*, which belongs to the group of countries with the best overall economic performance even though the initial conditions were not particularly favourable. Thus, Austria has a large share of its labour force employed in agriculture and in industries (particularly textiles and steel) which have been hard hit by recession and international competition. A unique feature has been the Austrian approach to macro-economic policies ("Austro-Keynesianism") which, within the framework of the "social partnership", combines a hard-currency option with an active fiscal policy and a relatively accommodating monetary policy. Until recently, Austria had been comparatively little affected by the international recession, and the rate of unemployment – also helped by a high degree of wage flexibility – remained near 2 per cent., with an inflation rate well below the OECD average. Public-sector deficits had not been a major concern, and the monetary authorities have only occasionally encountered difficulties in meeting the twin targets of accommodating the nominal income gains as determined within the social partnership and of setting interest rates at levels which prevent capital outflows;

– *Belgium*, which is one of the countries to record a pronounced deterioration in economic performance. Belgium entered the 1970s with low inflation and unemployment rates and a large

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surplus on external account, though it was also among the few countries which were already experiencing problems in financing public expenditure. By the early 1980s, however, both unemployment and the public-sector deficit had increased to record levels in international as well as historical terms, the external balance had moved into substantial deficit and the rate of inflation was accelerating in the middle of a global disinflationary process. It is true that Belgium's industrial structure made it particularly vulnerable to adverse international trends, but, in addition, high labour costs and extremely rigid wage behaviour have hampered the adjustment process;

- *Canada*, which, unlike most other industrialised countries, experienced a terms-of-trade improvement during the first half of the 1970s, but, like its neighbour to the south, also saw a pronounced deterioration in productivity growth. Canada was among the first countries to adopt money supply targets in the implementation of monetary policy, and another feature of policies in Canada has been the use of wage and price controls. Until recently, fiscal policy was not constrained by concerns about public-sector deficits, and the unemployment rate, though high by international standards, rose only moderately during the 1970s and mainly as a result of unusually strong growth in the labour force;

- *Sweden*, which is a representative of the "Scandinavian group" with its traditional emphasis on the full-employment target. Sweden also has a long tradition of active use of fiscal policy and it was in a favourable position by the time of the first oil price rise, with both public-sector finances and external account in large surplus and the economy recovering from a mild recession. However, like Belgium – though for different reasons – Sweden encountered problems in maintaining international competitiveness, and the authorities chose to replace the previous hard-currency policy with frequent and large exchange rate adjustments. Another feature of Swedish policies has been the very extensive use of labour-market measures and subsidies to

weak firms, which have helped to keep the registered unemployment rate low but at the expense of a growing public-sector deficit and slumping productivity growth.

Although the four countries have been chosen primarily on the basis of differences in economic performance, in institutional and structural factors, and in the composition and implementation of macro-economic policies, there are also important similarities. Most of these will be discussed in the following, but it may be noted here that in all four countries the most recent developments and policy measures may imply a break with earlier trends: Austria and Canada have seen a major increase in unemployment and public-sector deficits, while their external balances, for the first time in many years, have moved into surplus; Belgium has introduced sweeping measures (including a devaluation and a temporary suspension of the indexation system) in an attempt to improve competitiveness, promote wage flexibility and reverse the unfavourable trend in the public-sector finances and the external balance; and Sweden has also resorted to devaluation in order to improve competitiveness and the external balance, and initial steps have been taken to reduce the public-sector deficit. Secondly, and of particular importance in assessing policies, all four countries may be considered examples of small open economies closely linked to a "large neighbour", with the special problems (or advantages) which such links may create.

Against this background, the next section looks more closely at macro-economic policy-making, and this is followed by a discussion of monetary developments and inflation. Section E is devoted to an analysis of wage behaviour and to its rôle in promoting or obstructing the adjustment process, while Section F analyses the adjustment process on the basis of changes in sectoral financial balances. Finally, Part III derives some tentative conclusions from the preceding analyses.

B. Adjustment policy profiles: four approaches

Our four economies have faced common problems of adjustment deriving from the emergence of worldwide inflation, recurrent oil

and commodity shocks, high international interest rates and tendencies towards large-scale unemployment. Beyond these similarities, however, these economies are representative of quite different choices in policy priorities and approaches. To a significant extent, these choices marked a continuation of each country's earlier policies within relatively unchanged institutional constraints, but now being tested in a new environment of recurrent disturbance and shocks. As time went on, of course, new policy adaptations were seen as desirable or unavoidable. The purpose of this section is to present a short characterisation of the four policy approaches with a view to highlighting some of their principal similarities and differences.

(a) Austria

In many respects the most unusual – and successful – case was that of Austria. Demand management policies in that country – although timely in terms of the business cycle – have not only aimed at fine-tuning the economy but more importantly have attempted to affect expectations in a stabilising way. In this context the policy-makers have been able to start from an established, continuing incomes policy of an effective kind. In brief, the wage/price outcome is the result of the voluntary, informal co-operation of labour and business working within the confines of the so-called "social partnership", a highly institutionalised system of political and social consensus that evolved out of Austria's harsh experiences leading up to and following the Second World War. Price adjustments over a wide range of goods and services are subject to approval by a sub-committee of the Joint Commission for Prices and Wages, and wage bargains must be acceptable to the Wage Sub-committee.*

* The social partnership, which has attracted considerable attention outside Austria, has a number of features that bear on the adjustment process. It is not a narrowly defined incomes policy but rather a broadly based set of institutions which encompasses virtually all aspects of economic policy-making. On occasion (1967 and 1975) tax/wage bargains have been concluded within this framework, and the hard-currency option (endorsed by the trade unions as a means of preserving international competitiveness) is one of its cornerstones. Negotiations are highly centralised, with both employees and employers being represented by parallel organisations

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The achievement of satisfactory wage/price results is said to be facilitated by Austria's pursuance of a hard-currency policy, which aims at minimising fluctuations between the schilling and the Deutsche Mark. Wage bargaining looks for guidance to the outcome of negotiations in Germany, particularly in the metal-working industry, and prices are adjusted, on the basis of rises in costs, with an eye to international competitiveness. In this respect, much as had been hoped of monetary targets in other countries, the hard-currency policy has been a basis for helping to stabilise the expectations of domestic economic agents. The Austrian hard-currency policy also lends a new twist to the Scandinavian theory of inflation: in a highly competitive environment, with prices in the exposed sector leaving little margin for advantageous bargaining, incomes policy has focused largely on the importance of exercising reasonable restraint on wage increases in the sheltered sector in order not to upset historical wage relativities.

Freed from any overriding concern about autonomous wage/price pressures, the Austrian authorities through most of the 1970s were able to follow a counter-cyclical budget policy (see Graph 3). Moreover, with real wages being kept under reasonable restraint, the maintenance of high levels of employment was possible without an unduly large growth of public-sector expenditure, particularly of transfer payments (see Table 4).* Thus, unlike most countries,

(Chambers (compulsory) and Associations (voluntary)), and decisions in the centralised bodies – including the subordination of specific income claims to common economic targets – are largely accepted at the sectoral and individual company levels. While the Price Sub-committee can control most prices, the Wage Sub-committee can only influence the *timing* of wage increases. Nonetheless, the impact of direct price control seems small compared with the more indirect inducement to wage restraint provided by the principle of cost-based price increases. For more details concerning the social partnership (or economic partnership as the labour representatives prefer) see *The Economic Survey on Austria*, OECD, 1982, Farnleitner and Schmidt (1982), and Flanagan et al. (1983).

* However, in assessing employment trends in Austria, the following features should be noted: (i) there has been a large reduction in the number of foreign workers, though not on the same scale as in Switzerland and Germany; (ii) vacations were extended from three to four weeks in 1972 and the average working week was reduced from 42 to 40 hours in 1975; and (iii) the bulk of employment growth during the recession has taken place in the service sectors and in the nationalised industries.

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Graph 3

Indicators of fiscal policy

Changes in actual and structural budget balance, as a percentage of GNP

──────── GNP, percentage change,
deviation from 1970–80 trend

Change in full-employment balance
(+ = move towards larger surplus)

Change in actual public-sector balance
(+ = move towards larger surplus)

Source: OECD

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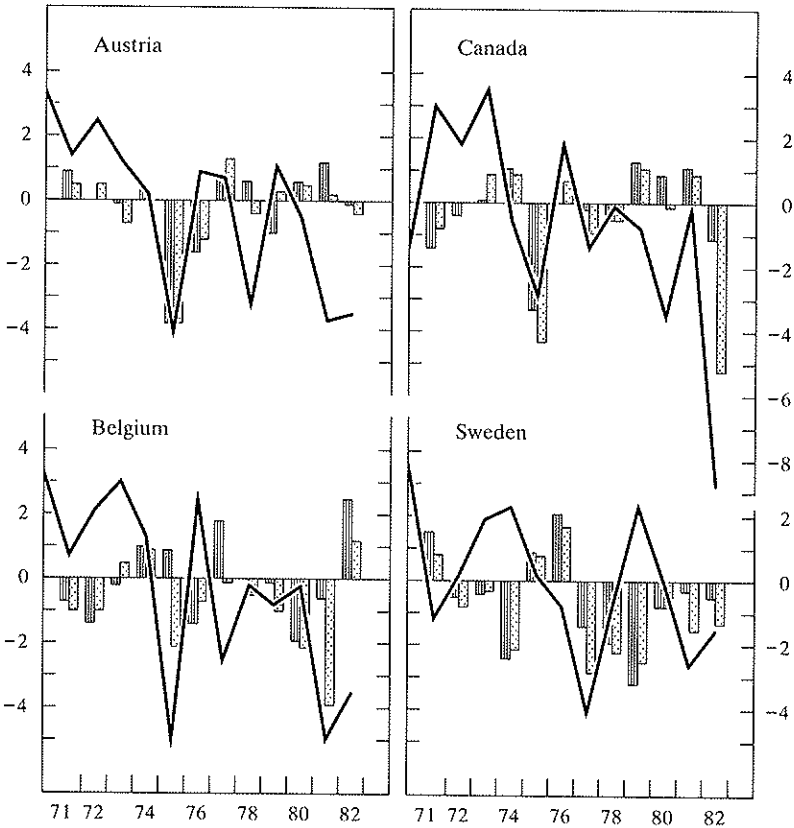
Table 4

Indicators of fiscal policy

Countries and items	1960	1970	1973	1975	1978	1980	1981	1982[1]
	as a percentage of GNP/GDP							
Canada								
Public expenditure . . .	28.5	35.0	35.1	39.7	40.3	40.2	41.0	45.6
Goods and services . .	16.5	21.7	20.7	22.4	22.2	21.4	21.3	23.0
Transfers	12.0	13.3	14.4	17.3	18.1	18.8	19.7	22.6
of which: interest .	2.8	3.8	3.9	4.0	4.9	5.3	6.2	7.2
Revenue	26.7	35.9	36.1	37.3	37.3	38.1	39.8	40.3
Deficit (+)	1.7	−0.9	−1.0	2.4	3.0	2.1	1.2	5.3
Public debt	.	64.5	56.9	55.3	60.4	58.5	59.4	65.8
Austria								
Public expenditure . . .	32.1	38.2	38.6	44.2	48.3	46.9	48.2	48.3
Goods and services . .	19.4	19.8	20.4	22.8	23.3	22.4	22.6	.
Transfers	12.7	18.4	18.2	21.4	25.0	24.5	25.6	.
of which: interest .		1.1	1.1	1.4	2.2	2.5	2.7	3.2
Revenue	31.0	39.7	41.9	42.8	46.2	45.9	47.4	46.2
Deficit (+)[2]	1.1	−1.0	−1.3	2.5	2.8	2.0	1.8	2.2
Public debt	.	19.4	17.5	24.0	33.9	37.1	39.2	41.0
Belgium								
Public expenditure . . .	30.3	37.0	39.7	45.3	49.1	52.7	58.9	60.0
Goods and services . .	14.7	17.4	18.4	20.5	21.5	22.5	21.8	21.2
Transfers	15.6	19.6	21.3	24.8	27.6	30.2	37.1	38.8
of which: interest .	2.9	3.4	3.4	3.6	4.6	6.3	8.0	9.5
Revenue	27.5	35.7	37.0	41.2	43.5	44.1	46.7	48.8
Deficit (+)[2]	.	3.7	5.3	6.4	8.2	12.2	16.5	16.1
Public debt	.	65.2	61.9	58.7	65.5	76.0	88.2	97.4
Sweden								
Public expenditure . . .	31.3	43.8	44.9	49.1	59.0	61.6	65.9	68.2
Goods and services . .	20.2	28.2	27.7	28.1	32.6	33.3	33.8	33.7
Transfers	11.1	15.6	17.2	21.0	26.4	28.3	32.1	34.5
of which: interest .	1.7	1.9	2.0	2.2	2.7	4.1	5.7	7.4
Revenue	32.2	47.0	47.9	50.7	57.9	56.8	60.6	61.1
Deficit (+)	−1.1	−4.7	−4.0	−2.7	0.5	4.0	5.3	7.1
Public debt	.	33.6	35.6	35.6	41.7	52.7	60.3	69.1

[1] Preliminary data.   [2] Including lending transactions.

Source: OECD and national statistics.

Austria was able to meet the oil price shocks through a combination of incomes and exchange rate policies to offset the cost-push effect and fiscal policies to offset the deflationary effect. Some budgetary support was given to structurally weak industries, but for this purpose the authorities preferred to rely on accelerated investment

allowances and credits to sustain real capital formation. More recently, in the context of deep world recession, unemployment has risen significantly for the first time. Moreover, there are indications that the effectiveness of fiscal policy has declined, and the budget deficit has increased to disquietening proportions, leading the authorities, as in other countries, to introduce measures designed to reduce the structural component of the deficit.

Against this background, monetary policy was basically accommodative, with interest rates being kept in line with those in Germany (see next section). True, to keep credit to the private sector within bounds, ceiling limitations were in effect over most of the period, backed up by the condition that, if these ceilings were not observed, central-bank refinancing facilities could be restricted. However, though direct and indirect central-bank lending to the Government is, in principle,[1] forbidden in Austria, there was no question of not making available adequate sources of finance to the public sector. To avoid excessive recourse to domestic credit markets, and to alleviate any inconsistency between domestic and external objectives, the Government itself sought insofar as possible to borrow from the capital market and from abroad.

Austrian adjustment policies have not been without their difficulties. On occasion, as in 1975–76, real wages have been allowed to increase excessively, contributing in 1977 to an unusually rapid expansion of domestic credit. Another difficulty emerged in 1979 when interest rates were kept too low, leading to a large outflow of reserves. Moreover, the usefulness of the hard-currency policy has been questioned. Some critics feel that this policy tends over long periods to weaken competitiveness, undermine domestic industry and contribute to a long-persisting current-account deficit,[2]

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[1] The central bank may rediscount Treasury bills up to a maximum corresponding to 5 per cent. of the previous year's tax revenue.

[2] Since international price trends are not fully reflected in the domestic inflation rate (see Section E), it has also been suggested that exchange rate variations could be used to stabilise output and the balance of payments. However, given the rôle of exchange rates in the formation of inflationary expectations, the implications of such a policy change could not be assessed on the basis of past behavioural relations.

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while others maintain that it enforces greater cost effectiveness on the exposed sector and helps to dampen the rise in import prices as well as wages. What is noteworthy is that, when difficulties emerged or mistakes were made, Austrian adjustment policies were sufficiently flexible to remedy the situation in due course. It might also be fair to characterise Austrian policy as constituting a policy-mix approach to monetary control. In other words, by focusing their adjustment efforts so successfully on incomes and fiscal policies in the context of a hard-currency policy, the Austrian authorities tend indirectly to achieve a satisfactory path of money growth.

(b) Belgium

Like Austria, Belgium consistently opted for a hard-currency policy, but in terms of policy objectives Belgium's emphasis on combating inflation sharply contrasted, formally at least, with the priority given in Austria to low unemployment. In practice, moreover, there were several fundamental weaknesses which in the Belgian environment accentuated the problems of achieving both full employment and low inflation. Firstly, in terms of openness, Belgium's exposed sector is more than twice as large, measured relative to GNP, as that of the other three countries. Secondly, the structure of Belgian industry, with its emphasis on older traditional industries, was ill-suited to the changed competitive environment of world trade in the 1970s and 1980s. Thirdly, in sharp contrast to the consensus incomes policy ingrained in the Austrian setting, Belgium was burdened from the beginning with a comprehensive system of wage and salary indexation, in both private and public sectors. With the external shock experienced in the 1970s, the key problem which emerged was that of high real wages combined with strong built-in rigidities.

Belgium, much like the other three countries, sought by means of fiscal policy to alleviate the growing problem of unemployment, though its measures appear to have been ill-timed and worked in a pro-cyclical way (see Graph 3). Moreover, given its cyclical and structural competitive weakness, both abroad and at home, budget

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deficits mounted sharply over the years (see Tables 4 and 6). Expenditure increased virtually across the board: indexed public-sector wages, educational and social outlays, other transfer payments and not least – with its relatively large public-sector debt – interest payments. By the advent of the second oil shock and its aftermath, the public-sector deficit had emerged as a major problem in its own right.

Despite these cumulating difficulties, the authorities considered it vital to adhere determinedly to a hard-currency policy, backed up by a dual exchange rate system and, as appropriate, an adjustment of domestic interest rates. Although, apart from periods of exchange-market pressures, the central bank sought to keep interest rates as low as possible, rates generally tended to move much closer to US interest rates than German ones (see Table 5) – a reflection, perhaps, of Belgium's high degree of financial openness. Even so, the maintenance of the exchange rate parity required heavy intervention, supported by growing recourse over recent years to borrowing abroad by both the private and the public sector.

The authorities resisted a devaluation of the Belgian franc until 1982. The view taken was that, given Belgium's extreme dependence on imports and the existence of comprehensive incomes indexation, devaluation would be inflationary and ineffective unless accompanied by appropriate stabilisation measures. On the basis of emergency legislation in early 1982, permitting economic measures by decree, the franc was devalued in February by 8½ per cent. within the EMS, accompanied by a temporary price freeze and suspension of incomes indexation arrangements,* with a relaxation to take place only gradually. In consequence, an effective devaluation along text-book lines proved possible, accompanied by a substantial reflux of capital but a relatively small change in relative prices.

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* A less extreme indexation scheme is planned for future years, but the Government can take discretionary measures in case wage increases weaken the competitive position.

(c) Sweden

In Sweden, and in Canada as well, relatively heavy dependence on exports of primary industry imparts an extra dimension to openness, as does a tendency for domestic activity to lag behind economic developments abroad. Broadly speaking, these countries fall somewhere between Austria and Belgium in terms of their susceptibility to external disturbances. At the same time, Sweden is much like Austria in the importance it attaches to the maintenance of low levels of unemployment. It cannot be said, on the other hand, that incomes policy has been a very helpful instrument in adjusting real wages to changing external conditions. In practice, therefore, Sweden's commitment to exchange rate stability has proved to be weak, and it has relied primarily on fiscal policy, together with several exchange rate adjustments, to keep unemployment low while seeking to preserve external competitiveness. In the circumstances, monetary policy has been aimed mainly at liquidity control, exercised largely by means of credit ceilings, liquidity ratios and investment quotas for banks and other financial institutions. As in Belgium, the monetary authorities have consistently argued that the demand for money was unstable, relying instead on a credit-market approach. In contrast to Belgium, however, efforts have been made in Sweden to channel credit towards priority sectors, particularly to the central government and housing. Interest rates, though still subject to supervision, have over the years been increasingly adapted to international market conditions, and the domestic scope for market-determined rates has increased.

On grounds of openness and as a counter to inflation, Sweden has viewed a stable exchange rate as being, in principle, a desirable aim of policy.* From 1973 to 1977 it adhered to a hard-currency policy as a member of the European "snake" arrangement. A strong current-account balance-of-payments position, together with a marked increase in profits in 1973–74, enabled Sweden to weather

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* The authorities, however, have opposed the view advanced by an influential group of academics that exchange rate appreciation should be used as an instrument to reduce inflation.

the initial phase of the first oil shock quite well. Expecting that the world recession would be short-lived, the authorities deliberately chose expansionary demand management policies, both fiscal and monetary, in an effort to sustain output and employment. However, wage pressures were mounting in response to the strong profit rise in 1973–74 while, at the same time, the accommodative policy weakened employers' resistance, leading to a 40 per cent. rise in nominal wage costs in only two years. In consequence, external payments difficulties began to build up in 1976, and the international competitiveness of Swedish firms deteriorated sharply (see Graph 6). These developments led, despite a tightening of policies, to a sizable devaluation in April 1977 (6 per cent. against the Deutsche Mark) and subsequently, in August, to a withdrawal from the "snake" arrangement, a further 10 per cent. devaluation and a decision to fix the krona in terms of a weighted currency basket. As external conditions eased, and as a moderation of wage settlements was achieved, expansionary policies were again put into effect on domestic grounds. Thus, when the second oil shock set in, Sweden found itself, with a sharply weakened public-sector balance and relatively low interest rates, facing a renewed deterioration in its payments position. In the course of 1981 a new programme of wage restraint was agreed upon and fiscal and monetary policies were tightened. However, the appreciation of the US dollar within Sweden's currency basket caused the krona to appreciate relative to the Deutsche Mark, and growing competitive pressures led the authorities to devalue the krona by 10 per cent. in October. Subsequently, when despite this move the current-account deficit did not decline, the new Government decided on competitive grounds to devalue by a further 16 per cent. in October 1982.

Thus, Sweden's exchange rate difficulties started around the middle of the 1970s and to a considerable extent reflected a progressive weakening in the current account. As time went on, it became apparent that the deterioration was partly of a structural nature, stemming much as in Belgium from excessive dependence on traditional industries such as steel, textiles, shipbuilding and paper

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products. But the difficulties were also largely attributable to discretionary policy efforts to compensate external disturbances and to keep employment high.[1] This resulted in a strong "stop-go" cycle in which every easing of the external constraint was followed by a move to more expansionary domestic policies, mainly of a budgetary nature, leading to an acceleration of domestic credit expansion and price inflation, widening external deficits and increased recourse to foreign borrowing.[2]

Among the four countries, therefore, Sweden stands out for its heavy emphasis on fine-tuning by way of compensatory fiscal policy.[3] Expansionary measures were taken in the wake of the first oil shock and despite occasional tightening, fiscal policy remained strongly expansionary over the rest of the decade, with the central government's borrowing requirement rising from about 2 per cent. of GNP in 1976 to about 11 per cent. in 1980. Total expenditure and taxation, already comparatively burdensome, accelerated rapidly after 1973, being higher relative to GNP than in most other OECD countries. One feature in Sweden was the growth of industrial subsidies during the 1970s, the aim being to "bridge" the weakness in world demand so as to keep down unemployment. However, as

[1] Mention should also be made of a specific structural or institutionalised problem. Traditionally, trade unions have aimed at a "solidaristic wage policy" whereby rapidly growing industries set the pace while weak firms went out of business. This worked satisfactorily as long as world trade was expanding and the exposed sectors could absorb labour from the weak firms. However, with the slump in world trade and the deterioration in competitiveness, the "solidaristic wage policy" came into conflict with full-employment policy. With the latter still given high priority and unions unwilling to accept productivity-based bargaining, the Government has had to "absorb" an increasing part of employment in one form or another, thus contributing to the rapid growth of public-sector spending.

[2] In both 1980 and 1981 public-sector borrowing abroad corresponded to around 15 per cent. of the broad money stock.

[3] In the 1950s and 1960s anticylical investment fund shemes constituted another important element of fiscal policy which helped to stabilise investment, particularly in manufacturing (see Taylor (1982)). For most of the period since 1975 firms have been able to draw freely on these funds, but investment has declined nonetheless.

this involved substantial assistance to declining industries, such as shipbuilding, steel and wood and paper products, policy in the early 1980s turned towards reducing these subsidies. Another feature of budgets was the substantial size of social expenditure and benefits, in some cases (e.g. pensions) indexed in such a way as to provide a gradual improvement in real terms. By 1980 it had become widely appreciated that the large size of the public sector, and the heavy financing requirement, were tending to crowd out private investment activity and impede external adjustment. In conjunction with the two devaluations, fiscal policy became more restrictive, involving some cuts in public consumption and investment, lower subsidies and curbs on transfer payments.

In Sweden monetary policy has traditionally been framed in terms of the availability of funds rather than the stock of money, the demand for which is considered unstable and unpredictable. Moreover, given the strong emphasis on economic and social priorities, a sectoral credit-market approach has been emphasised to ensure that funds are available to particular activities. The stress has been on liquidity control: liquidity ratios (and sometimes quantitative lending limits) for the commercial banks, investment ratios for other banks and insurance companies, capital issues control and qualitative guidelines. Debt management, featuring insofar as possible sales of public debt to non-banks, has relied heavily on these control instruments, because interest rates have been highly regulated and generally low relative to international markets. For a number of years now the growing public-sector financing requirement has involved heavy recourse to financing via the banks, though increasingly, in order to avoid crowding out company borrowing and to help finance the external deficit, the Government – in much the same way as in Belgium – has stepped up its borrowing abroad. While recent monetary policy has featured sustained high interest rates and has benefited from the use of new debt-management instruments, economic policy in Sweden is currently relying also on budgetary restraint combined with wage moderation.

(d) Canada

In contrast to the other three countries, Canada was alone in placing reliance mainly on monetary policy for stabilisation purposes, with the exchange rate in principle floating freely after 1970. After the first oil shock, it is true, an expansionary budget policy was pursued in order to sustain activity. Moreover, and even more than in Sweden, the commodity boom, combined with low domestic interest rates to limit exchange rate appreciation, helped to stimulate inflationary pressures and to move the current account into substantial deficit beginning in 1974. By late 1975 inflation had assumed top priority, and the authorities introduced a mandatory programme of price and wage controls which continued in effect until 1978. In addition, the Bank of Canada adopted a target for the trend growth of M_1, with an ensuing rise in interest rates relative to those abroad being accompanied by a sharp appreciation of the nominal and real effective exchange rate. An easing of inflation in 1977 and 1978 led to a lowering of interest rates, a dismantling of price/wage controls and a sharp depreciation in the nominal and real effective exchange rate, not, however, with any significant improvement in the current-account deficit.* Partly as a result of this experience, the authorities appear thereafter to have given more attention to the exchange rate, though continuing to fix monetary targets aimed at gradually reducing the rate of monetary growth. A further phase in exchange rate policy emerged as the US dollar strengthened. High domestic interest rates, together with a desire to limit the inflationary consequences of any further depreciation in US dollar terms, contributed to a rise in the real effective exchange rate and some loss of competitiveness.

As already mentioned, monetary targeting seems to have little appeal for the typical small, open economy. For this reason, the Canadian experience is of particular interest and, as an approach, is based on some rather special features (see the following section).

* The National Energy Programme also contributed to the weakening of the currency and to the rise in the external debt.

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Eventually, in 1982, targeting was abandoned, principally because financial innovations were rendering the demand for M_1 too unstable for use as an intermediate policy objective. More generally, targeting in Canada can claim only limited success in coping with inflationary expectations and adapting to the implications of low productivity growth.

On the other hand, one fairly positive feature of the Canadian development was that fiscal policy, although expansionary after the first oil shock, did not get out of hand in the following years (see Table 4). Tax subsidies and high interest rates might also help to explain a quite remarkable increase in household saving in the latter half of the 1970s. Since fixed capital investment remained relatively strong in Canada until the early 1980s, mainly because of resource and energy development, the buoyancy of final demand also helped to keep budget deficits within bounds. Another factor, of course, is that budgetary policy was not used as actively as, for example, in Sweden, though labour-market measures were also very important in the Canadian case.

In the course of 1981–82 Canada was hit by its worst recession of the post-war period. Reflecting its external exposure, including high international indebtedness, the main causal factors were disproportionate wage increases, high interest rates, weak world markets and low commodity prices and, to some extent, the strengthening of the currency in line with the US dollar. However, given that inflation in Canada, though steadily declining over recent months, is still higher than in the United States, Canada has kept the exchange rate vis-à-vis the US dollar very stable. At the same time, the budget last spring, while providing a short-run fiscal stimulus (higher public investment, tax concessions and measures to promote job creation), reflected a major effort to reduce the budget deficit over the medium term and to encourage business investment and exports.

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C. Monetary developments and policy

(a) Interest rates and exchange rates

Turning now to monetary implications, we first look broadly at comparative developments in terms of interest rate differentials, effective exchange rates and official reserve movements. In the small, open economy disturbances from abroad, in their monetary guise, present the authorities essentially with a choice in terms of interest rate adjustment, exchange rate adjustment and intervention, singly or combined. Broadly speaking, the outcome in these respects is shown in Graphs 4a and b.

As can be seen, short-term interest differentials vis-à-vis the United States tended to move inversely in relation to the variations in US rates themselves. This is a reflection of the fact that rates in the four countries followed a more stable path than those in the United States. Mainly for domestic reasons, Austria, Belgium and Sweden preferred over lengthy periods to engage heavily in exchange-market intervention rather than to adjust their domestic

Graph 4a

Short-term interest rates

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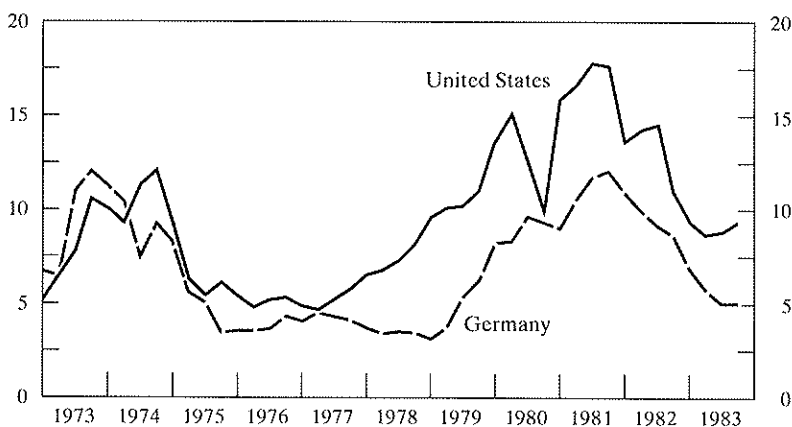
Short-term interest rate differentials, exchange rates and central banks' net foreign assets

— Differential, domestic rate minus US rate (in percentages)
...... Effective exchange rate index (left-hand scale)
⌐⌐ Index of net foreign assets (right-hand scale)
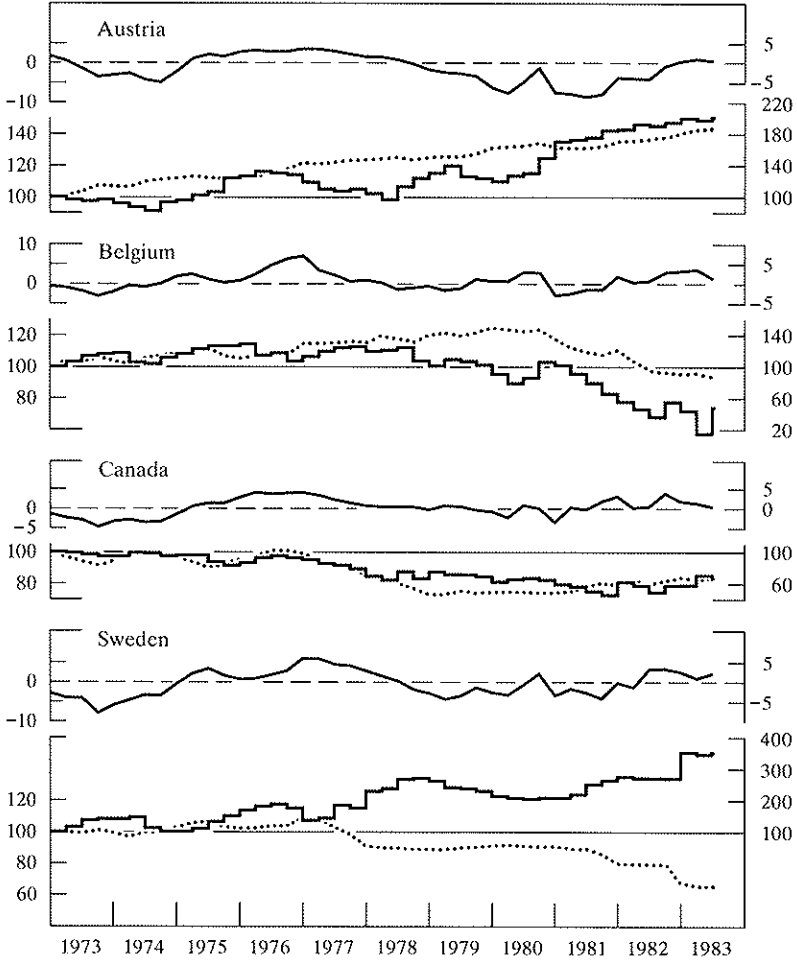
interest rates to still higher levels. Though in two cases – Sweden and Austria – official reserves increased over the period as a whole, the rise was made possible by substantial borrowing abroad. In all four cases, the international reserve position fared less well than it did in most of the larger countries.

In consequence, although exchange rate stability was viewed as a desirable aim of policy, some of these countries found it necessary, whether sooner or later, to take the impact of external disturbances partly on the exchange rate. Austria, supported more consistently by a satisfactory policy mix, was the main exception, with its nominal effective rate moving upwards fairly steadily over the whole period and its interest rates adjusting to German levels, which departed from those of the United States from 1977 onwards. Over substantial periods, it will be noticed, the Canadian effective rate moved broadly in line with the trend interest differential against the US dollar. In Sweden the three major depreciation phases occurred when the interest differential had been small or falling, though on the last two occasions interest rates were adjusted upwards substantially as part of the effort to defend against and adjust to exchange rate pressures and the emergence of a large public-sector deficit. Belgium has typically followed a very active policy with regard to adjusting short-term interest rates to counter external strains, but just as typically has tended to lower them for domestic reasons as these strains abated. In general, therefore, domestic considerations have figured importantly in the setting of interest rates. Over limited periods such considerations may justify intervention and borrowing abroad and to some extent exchange rate adjustment, but only insofar as appropriate macro-economic policies can subsequently be brought into place.

Table 5 provides a tentative assessment of how closely interest rates in the four countries are related to international rates, with Germany and the United States having been selected as representative of rates in key financial centres. Although there are some indications of mis-specified equations, the table points to a high degree of capital and money-market integration but also to

Table 5

Domestic and foreign interest rates

(Average annual data)

Countries	Dependent variables	Explanatory variables			$\hat{R}^2$	DW	Periods
		Constant	German rate[1]	US rate[1]			
Austria	Discount rate	3.40 (6.0)	0.20 (2.1)	0.04 (0.4)	0.32	2.2	1965–82
	3-month rate	3.35 (4.0)	0.14 (1.2)	0.42 (3.4)	0.66	1.8	1968–82
	Bond rate	4.13 (4.7)	0.24 (1.9)	0.30 (4.9)	0.73	0.9	1965–82
Belgium	3-month rate	2.49 (2.5)	0.02 (0.1)	0.70 (3.8)	0.57	2.0	1961–82
	Bond rate	1.86 (3.1)	0.02 (0.2)	0.86 (18.5)	0.96	1.4	1961–82
Canada	3-month rate	−0.42 (0.8)	– ([2])	1.21 (14.6)	0.90	0.9	1961–82
	Bond rate	0.56 (2.9)	– ([2])	1.02 (40.7)	0.99	1.6	1961–82
Sweden	3-month rate	1.54 (1.9)	– ([2])	0.75 (6.4)	0.64	1.7	1961–82
	Bond rate	1.88 (5.2)	– ([2])	0.86 (18.4)	0.94	0.9	1961–82

[1] 3-month rate and bond rate respectively, according to dependent variable.

[2] Excluded from final estimates as coefficient was found to be negative.

some interesting differences as to the sources and strengths of the international influences:

– *Austria* is the only country in which German rates have any significant influence* and, reflecting the hard-currency policy, the discount rate is more strongly influenced than the three-month market rate. As regards the bond rate, the impacts of changes in German and US bond rates are of about equal size. Interestingly, compared with the other three countries, Austrian rates are relatively independent, as only around one-half of international changes is reflected in domestic rates;

– *Belgium* and *Sweden* are very similar in that 70–75 per cent. of changes in US rates are reflected in domestic short-term rates, while for bond rates this proportion increases to 85 per cent. In both countries movements in the bond rate are almost entirely explained by international trends, while in the shorter run

* More recent evidence suggests that the influence of German interest rates increased after 1979 following the decision by the authorities in several European countries – particularly members of the EMS – to follow only partly the rise in US rates and accept a depreciation of their exchange rates against the US dollar.

unexplained deviations from international trends account for 36–43 per. cent. of the variations;
- in *Canada* the bond rate follows the US rate one-for-one. The three-month rate is less well determined and appears to have been subject to some instability.

(b) *Domestic credit expansion, external balance and money growth*

Viewed in a "monetary approach" framework, the external disturbances since the late 1960s appear to have initiated some complex two-directional transmission linkages. Initially, assuming a stable demand for money, these disturbances tended to depress domestic saving and stimulate the demand for credit. Depending upon the policy-mix reactions of the countries concerned, domestic credit demand was then either accommodated or partly restrained, with corresponding secondary implications for the balance of payments itself.

As Table 6 shows, domestic credit expansion (DCE) via the banking system accelerated from the early 1960s onwards in all four countries. Moreover, the balance of payments, as measured by changes in the banking system's net foreign assets (i.e. approximately the "basic" balance), shifted from a surplus in the years 1960–65 to a deficit in 1976–80. In terms of its percentage point contribution to acceleration in the broad money stock, DCE increased much more in Canada and Sweden than in Austria and Belgium. However, whereas in Sweden credit to the public sector accounted for about one-half of the increase, in Canada credit to the private sector was much the predominant influence. In part, this was a reflection of the better fiscal performance in Canada, but it was also due to the fact that public-sector financing in Canada occurred to a greater extent outside the banking system. In both countries the fast expansion of domestic credit was also associated partly with the external impulses feeding through the export sector. In Austria and Belgium credit to the public sector accounted for about one-third or more of total DCE over the two periods. As mentioned earlier, in

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Belgium, and to a lesser extent in Sweden and Austria, public-sector borrowing abroad was an important source of finance, though the actual mechanisms, and the extent to which borrowing occurs via the banking system, differ from country to country. As a generalisation,

Table 6

Sectoral credit contributions to the growth of money[1]

Countries and years	Credit to private sector	Credit to public sector	Total domestic credit expansion	Net foreign assets	Other items[2]	Money plus quasi-money	Memo item: GDP deflator
	percentage point contributions[3]						
Austria							
1961–65 av. .	9.3	0.8	10.1	4.5	− 1.9	12.6	4.1
1966–70 av. .	9.9	1.6	11.6	1.5	− 2.2	10.9	3.2
1971–75 av. .	12.9	2.8	15.7	2.0	− 3.4	14.3	7.6
1976–80 av. .	14.3	4.6	18.9	− 0.6	− 6.0	12.4	5.0
1981	10.3	2.9	13.2	1.3	− 3.6	10.9	5.9
1982	8.8	3.0	11.8	2.7	− 3.6	10.9	7.1
Belgium							
1961–65 av. .	3.9	3.9	7.8	1.2	− 0.5	8.4	3.1
1966–70 av. .	5.0	4.1	9.1	0.4	− 1.5	7.9	3.8
1971–75 av. .	6.9	6.2	13.1	1.3	− 1.1	13.3	8.6
1976–80 av. .	7.8	6.1	13.8	− 2.8	− 3.0	8.0	5.4
1981	4.6	11.9	16.6	− 9.1	− 0.5	7.0	5.2
1982	3.4	13.9	17.3	−12.9	2.8	7.2	8.0
Canada							
1961–65 av. .	6.7	0.2	7.0	2.3	− 0.4	8.9	1.9
1966–70 av. .	6.6	2.5	9.1	2.1	− 0.5	10.7	6.1
1971–75 av. .	15.4	2.0	17.4	0.1	− 1.4	16.1	8.6
1976–80 av. .	16.2	2.2	18.4	− 1.5	− 0.9	16.0	8.9
1981	17.4[4]	−1.3	16.1[4]	− 2.4	− 2.0[4]	11.7	10.1
1982	1.3	1.2	2.5	1.1	0.4	4.0	10.7
Sweden							
1961–65 av. .	6.9	− 1.1	5.7	2.1	− 0.3	7.6	4.1
1966–70 av. .	10.2	3.5	13.8	− 0.8	− 5.1	7.9	4.6
1971–75 av. .	9.1	2.9	12.1	2.1	− 2.3	11.9	9.0
1976–80 av. .	12.1	4.2	16.2	− 1.9	− 2.8	11.5	10.3
1981	9.8	10.2	20.0	− 4.0	− 4.9	11.1	10.0
1982	11.7	6.6	18.4	− 2.0	− 3.5	12.8	9.1

[1] Tentative and preliminary figures. [2] Includes increase (−) in banks' long-term (non-monetary) liabilities.
[3] Average over four quarters. The contributions of the counterparts add up to the percentage increase in the money stock. [4] Tentative estimates due to break in series.

Sources: IMF *International Financial Statistics* and national sources.

however, such borrowing tends to keep monetary conditions, including domestic interest rates, easier than they would otherwise be.

As the "monetary approach" implies, there has been a relatively close and negative relationship between the external balance and DCE.[1] Particularly in Austria, Belgium and Sweden intervention has driven a wedge between the behaviour of DCE and the money stock, with the latter mainly adjusting to the level of money demand. At one step removed, however, as may be seen in the cases of Canada and Sweden, the rapid acceleration in money growth between the 1960s and 1970s was itself associated with the speeding-up in domestic credit expansion. On the other hand, in Austria and Belgium the rate of money growth in the years 1976–80 was approximately the same as it was in 1961–65.

From the monetary standpoint, the disinflationary years 1981 and 1982 brought a greater diversity of behaviour. By that time, Austria had been able to correct the earlier excessive growth of real wages and bank credit and moved into a comfortable external surplus, though partly of a cyclical nature. In the other three countries, however, credit expansion was running at record levels in 1981.[2] In Belgium and Sweden the situation led to substantial devaluations, accompanied by stabilisation programmes, while in Canada, whose exchange rate was maintained relative to a

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[1] The closeness of this link, without imputation as to the direction of causation, can be seen in the correlation coefficients between the banking system's domestic credit expansion and changes in its net foreign assets (measured as a percentage of the money stock):

Countries	Periods	Correlation coefficient
Austria	1961–81	– 0.634
Belgium	1961–83	– 0.544
Canada	1969–83	– 0.378
Sweden	1970–83	– 0.698

Based on annual data for Austria and quarterly data for the other three countries.

[2] In Canada this was partly due to the takeover activity occasioned by the energy programme.

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strengthening US dollar, the outcome was severe domestic deflation. In Canada these developments have led more recently to a marked swing in the external balance, whereas in Belgium and Sweden the improvement is not reflected in the average figures for 1982 as a whole.

The monetary data shown in Table 6 provide only a partial picture of the rôle of financial flows in the four countries. The only exception is Austria, where the banking statistics cover a broad array of financial institutions. In the other countries, credit flows outside the banking system are of considerable importance.

(i) *Sweden.* Viewing the financial balance sheet as a whole, credit expansion in Sweden has accelerated over the last fifteen years. A particularly sharp increase occurred around 1976–77 (Table 7), when monetary policy was relatively loose and the general-government sector shifted into financial deficit and first began to borrow abroad. From 1977 to 1982 total funds raised by non-bank domestic sectors rose from about 19 to well over 25 per cent. of GNP. The proportion

Table 7
Credit-market flows: Sweden
(as a percentage of GNP)

Net flow	1968–70	1971–73	1974–76	1977	1978	1979	1980	1981	1982
Funds raised by:									
Public sector	3.0	3.2	3.7	5.2	8.5	9.9	10.7	12.0	13.5
Priority housing	6.9	5.7	4.6	4.4	4.5	4.9	4.2	4.1	4.0
Other private	3.8	6.0	7.8	9.1	7.6	7.2	6.6	8.1	9.1
Total	13.7	14.9	16.1	18.7	20.6	22.0	21.5	24.2	26.6
Funds advanced by:									
Banking system	5.9	6.3	7.0	3.5	7.8	6.6	5.6	8.3	3.6
Other financial institutions	5.1	6.0	5.4	7.6	8.1	8.2	7.0	6.6	7.3
Central government . . .	2.1	2.0	1.6	1.5	2.0	2.4	2.7	2.1	2.2
Non-financial public . . .	0.6	0.6	1.6	1.0	1.2	2.3	0.9	1.7	5.7
Total domestic	13.7	14.9	15.6	13.6	19.1	19.5	16.2	18.7	18.8
Foreign lenders	--	--	0.5	5.1	1.5	2.5	5.3	5.5	7.8
Grand total	13.7	14.9	16.1	18.7	20.6	22.0	21.5	24.2	26.6

Source: Riksbank Annual Reports.

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accounted for by public-sector borrowing went up at the same time from about 27.5 per cent. to over 50 per cent. From the monetary standpoint the most critical problem became that of controlling the liquidity creation stemming from the growing public-sector borrowing needs. The external deficit itself tended continuously to drain off domestic liquidity, but this was more or less replaced by borrowing abroad, at first by the central government but later also by local authorities and other borrowers so that foreign borrowing increased rapidly from 1977 onwards. Nonetheless its proportion of total borrowing rose only from 27 to 29 per cent., reflecting the sharp concurrent rise in borrowing from the domestic market as well.

At the same time, the share of credit expansion accounted for by the banking system dropped from about one-quarter in the years 1977–79 to little more than one-eighth in 1982. This development went hand in hand with certain financial innovations, partly of a policy nature, and reflected government efforts to control liquidity by facilitating recourse to non-bank financing. The most significant change was the introduction of one-year Treasury bills which could be subscribed only by the non-bank public. The scope of the money market has also been broadened by the wider use of bank certificates of deposit and financial instruments based on export claims.

As noted earlier, monetary policy in Sweden traditionally put its main emphasis on liquidity control and credit availability to particular sectors. The rôle of "credit rationing" changed around the middle of the 1970s, and a two-tier credit market began to develop, an organised sector subject to controls and another one relatively free. The free sector consists mainly of finance companies (numbering about 150), of which those associated with banks constitute the great majority, with loans being made at market-determined interest rates instead of regulated ones. Moreover, foreign borrowing proved to be another means of circumventing limits on credit availability: lending abroad was permitted if financed abroad, while domestically it was possible to obtain additional krona credit if this could be indirectly financed abroad.

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In short, the emergence of a large public-sector deficit, together with the ease with which it could be financed, increasingly became a source of massive liquidity creation.

(ii) *Belgium*. Like Austria and Sweden, Belgium has consistently rejected the idea of using a money stock target. It is believed that the demand for money, however defined, is too unstable to permit such a target to be a practicable tool of policy. The reasons which have been given are several: the high degree of openness and related shifts of funds internationally (especially changes in leads and lags), the large scope domestically for shifts between different types of deposit and between different types of financial institutions, the importance of the government securities market and the rôle of expectations, and, finally, the extensive use of overdraft facilities in the Belgian economy. From the outset of the floating rate era, therefore, Belgium opted for a hard-currency policy, to which it steadfastly adhered, first under the European "snake" arrangement and subsequently under the European Monetary System. Owing to the variable, and sometimes large, degree of monetary financing of budget deficits (see Table 6), much attention has focused on the control of credit expansion to the private sector. In this context, bank liquidity is considered a key indicator, and the authorities have on occasion had recourse to reserve requirements, credit ceilings and portfolio investment ratios for financial institutions. However, considering the whole of the period under review, the adjustment of interest rates, supported at times by large-scale intervention (including government borrowing abroad) has been the principal instrument for keeping the exchange rate stable in relation to the currencies in Belgium's main trading partners. Another supporting element has been the continuing use of a dual exchange-market system – a regulated market for current transactions and most transfer payments and a free market for most transactions of a capital nature.

In view of the perceived instability of money demand, the monetary authorities have paid considerable attention to sectoral financial analysis and the overall flow of funds. Experience since the

Table 8
Credit-market flows: Belgium
(as a percentage of GNP)

	1970–73	1974–77	1978	1979	1980	1981	1982
Funds raised by:							
A. Companies and individuals	8.2	9.6	9.0	9.5	7.1	5.8	4.3
Sources							
Belgian financial intermediaries	6.4	7.3	6.9	8.2	5.0	2.9	1.3
of which:							
– credits granted mainly to individuals	(2.0)	(3.0)	(3.7)	(4.0)	(2.5)	(0.9)	(0.9)
– other credits	(4.4)	(4.3)	(3.2)	(4.3)	(2.6)	(2.1)	(0.4)
Belgian non-financial sectors	0.9	0.7	0.7	0.2	0.3	0.3	0.6
Foreign countries	0.9	1.6	1.4	1.1	1.8	2.6	2.4
B. Public authorities	3.8	5.7	7.4	8.6	11.6	15.6	15.4
Increase in							
– foreign currency liabilities	−1.0	−0.1	0.4	1.3	2.7	6.1	6.3
– other liabilities	4.8	5.8	7.0	7.3	8.9	9.5	9.1
C. Total non-bank private sector = A+B	12.0	15.3	16.4	18.1	18.7	21.4	19.7
Funds advanced by:							
D. Individuals and companies in the domestic market . . .	11.8	14.0	12.9	11.8	10.7	10.0	12.2
E. Central bank	0.1	0.6	1.4	1.4	−0.6	2.8	0.8
F. Total domestic = D+E .	11.9	14.6	14.3	13.2	10.1	12.8	13.0
Foreign lenders							
G. Lending in foreign currencies to the public sector	−1.2	0.0	0.4	2.2	4.2	8.0	7.0
H. Other capital inflows . .	1.8	1.6	2.3	2.6	3.1	0.5	n.a.
I. Total foreign = G+H .	0.6	1.6	2.7	4.8	7.3	8.5	n.a.
J. Discrepancy	−0.5	−0.9	−0.6	0.1	1.3	0.1	n.a.
K. Grand total	12.0	15.3	16.4	18.1	18.7	21.4	19.7
Memorandum item: Bank credit to public and private sectors	4.9	5.0	4.8	7.0	5.8	5.2	5.6

Source: National Bank of Belgium.

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early 1970s has borne out the relevance of this approach. Total funds raised by domestic sectors, both at home and abroad, rose from 12.6 per cent. of GNP in 1974 to 21.8 per cent. in 1981 (Table 8). Almost the entire increase reflects the growth in the public sector's borrowing requirement, which as a proportion of total funds raised went up from 30 per cent. in 1974 to nearly 75 per cent. in 1981. Beginning in 1979, however, an increasingly large part of public-sector borrowing took the form of foreign-currency debt, representing funds taken up abroad by the Treasury and other public entities. Thus, foreign borrowing helped to finance the growing external deficit as well as public-sector needs, and it tended at the same time to keep domestic monetary conditions easier than they otherwise would have been.* On the other hand, financing the public-sector deficit and maintaining foreign reserves without recourse to external borrowing would probably have required levels of interest rates, which would have been much out of line with domestic policy aims. It should be added that a growing part of households' financial saving was at the same time going abroad and coming back via the interbank market.

Seen as a trend, company profit margins showed a fairly steady deterioration from 1973 onwards. However, companies reacted to this by cutting back on investment and reducing employment, with the result that their new borrowing on credit markets recorded only a modestly rising tendency. In this sector, too, recourse to foreign borrowing increased significantly in relation to total borrowing.

Taking the private sector as a whole, financial asset formation exceeded that of financial liabilities after 1973. However, as the public sector's financing requirement rose from 4 per cent. of GNP to over 16 per cent. in 1982, it absorbed the increase in the private sector's net financial assets and formed the financing counterpart of the external deficit as well.

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* In terms of the broad money stock, public-sector borrowing abroad corresponded to 21.5 per cent. in 1981 and in 1982 reached 25 per cent.

Despite the authorities' concern about credit expansion to the private sector, one feature of the Belgian case has been the tendency since the early 1960s for the banking system's credit to the private and public sectors to be positively related over the business cycle, thus tending to magnify swings in the money supply. The reasons for this are not altogether clear. One factor appears to be Belgium's comprehensive system of indexation, which may in a period of rising output and inflation, for example, cause company as well as public-sector expenditure and financing needs to increase unduly. Another factor appears to have been the tendency for discretionary fiscal measures to be ill-timed in terms of actual movements in real output.

(iii) *Canada.* As noted earlier, Canada stands out among the four countries for the relatively strong emphasis that it placed on monetary policy for stabilisation purposes. Although this was perhaps more evident from about 1975 onwards, following the introduction of an M_1 growth target, targeting did not change operating procedures in any fundamental way. Indeed, monetary policy had traditionally relied for its effects on generalised interest rate influences stemming from its actions to influence the banks' cash reserves, and this approach remained more or less intact. The purpose of targeting was seen more in avoiding cumulative errors through biased reactions to short-term developments, in helping to avoid pro-cyclical monetary responses and in influencing market expectations. The main difference, however, lay in the emergence of inflation as a persisting, growing problem and the recognition that monetary policy would have to assume a major rôle in combating it.

The intensification of inflation around the middle of the 1970s was an outgrowth of the international commodity boom of 1972–73 followed by the first oil shock. At first, from about 1970 to early 1973, Canada's balance of payments was strong, interest rates could be kept low on domestic grounds and exchange rate appreciation was avoided. However, both M_1 and M_2 went up quite sharply over the two years to mid-1974. Discretionary fiscal measures were also used to sustain activity after the oil price shock, contributing their part to the emergence of a substantial external current-account

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deficit. In consequence, given the large external deficit, the introduction of a monetary target presented no problem of conflict with the exchange rate, although it contributed to a widening of interest rate differentials in favour of Canada in 1975.

However, in 1976 and 1977, interest rate differentials dropped fairly steadily, and the Canadian dollar depreciated substantially over the two years 1977–78. Up to a point this was consistent with the perceived need to improve competitiveness, but by the time price and wage controls were dismantled fears had grown that progressive depreciation might only be the forerunner of new inflationary pressures. Against this background, and with the second oil shock exacerbating the inflationary problem, the authorities began to give more attention to keeping the exchange rate stable, particularly vis-à-vis the US dollar. Still, however, it could not be said that there was any conflict between monetary and exchange rate considerations.

Against the background of a high inflation rate, the first setting of the M_1 target in 1975 established a growth range of 10–15 per cent., which was to be brought down gradually from year to year. In this respect the authorities were quite successful, and the target for 1982, prior to its being dropped as no longer workable, was 4–8 per cent. Except for several cases of undershooting (particularly in 1976–77 and 1981–82) the technical performance in hitting the target was noteworthy. Nonetheless, Canada experienced an acceleration in the rate of consumer price inflation from 1976 to the end of 1981 before a decline finally set in.

The possible reasons for this disappointing outcome present an interesting puzzle. It may be pointed out that the choice of M_1 was based on its earlier stability characteristics and its substantial elasticity with respect to interest rates, but it is interesting to note that, as a share of total financial assets, M_1 in Canada is very small compared with that in other countries, including the United States. In fact, its control was based on a "feed-back" approach under which, because of the closeness of its relationship with final demand, it could serve as an indicator of the need for adjustments in interest

rates. However, there was never any ambiguity about the underlying view that it was interest rates which served as the cutting edge of the transmission process, not the quantity of M_1 as such. Moreover, given that the M_1 target was set in terms of a *trend* growth rate, there was considerable built-in flexibility with respect to interest rate and exchange rate considerations. Thus, the authorities have not paid attention to M_1 to the exclusion of other guides to policy. In particular, in the case of higher import prices, exchange rate depreciation would tend to lead any corrective signals that might subsequently come from new inflationary pressures and an induced rise in M_1. The same would be true in the case of an improvement in the terms of trade that stimulated increased demand for wages in the export sector.

One reason for the disappointing performance of targeting in terms of final results may have been that from the start targets were pitched too high and/or not brought down fast enough. The subsequent support deriving from the prices and wages control programme, as well as from the marked depreciation in the exchange rate over the two years prior to the second oil shock, lend credence to this possibility. Moreover, M_1 was chosen primarily because of the closeness of its relationship with nominal GNP and its susceptibility to control by the central bank via interest rate variations. In practice, as the next section shows, M_2 appears to be more closely related to price behaviour, although it is less amenable to control by short-term interest rate changes and the causal relationship is ambiguous.

A third reason, related to the preceding one, may lie in the instability of overall flows of funds, which in turn was caused partly by financial innovations. As shown in Table 9, Canada is similar to the United States in that it has experienced a strong trend increase in the income velocity of M_1, whereas in Germany, where little financial innovation has taken place, M_1 velocity has remained very stable. Even more than in the United States, however, financial assets other than M_1 have grown in importance, and the ratio of total credit (excluding equities and trade credit) to M_1 rose in Canada

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Table 9
Velocity of M_1 and total credit (TC)

Countries	GNP/M_1		TC/M_1		GNP/TC	
	1967	1981	1967	1981	1967	1981
	ratios					
Canada	4.0	10.1	8.6	23.2	0.47	0.44
United States	4.5	6.8	6.6	10.2	0.69	0.67
Germany	6.2	6.4	8.1	11.3	0.77	0.57

Source: National flow-of-funds accounts.

from 8.6 in 1967 to 23.2 in 1981. With the relative importance of M_1 having declined to such an extent, it is not surprising that the link between the narrow money stock and total credit and, via this link, total spending should show greater instability. In both Canada and the United States the ratio between total credit and GNP has remained quite stable, whereas in Germany it has declined, probably reflecting in the latter case a relatively high rate of financial saving.

Canada's abandonment of its M_1 target in late 1982 did not signify any change in monetary stance and the predilection for targeting remains, as it is seen to provide the central bank with a "place to stand". The reason, rather, was that rapid financial innovation, resulting in changes in the forms in which money balances are held, was rendering M_1 unusable. In the Canadian case, the underlying factors were inflation, high interest rates, computer technology and financial competition. Interestingly, in contrast to developments in the United States, financial deregulation was not a factor (see Freedman, 1983). To illustrate, banks have on an increasing scale been offering business firms cash management facilities involving the daily consolidation of all their current-account balances on a country-wide scale. In some instances this has involved the elimination of business holdings of M_1, or, alternatively, arrangements which encourage M_1 holdings on the basis of negotiated rates of return. For individuals the banks began in 1979

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to offer savings accounts with interest rates calculated on a daily basis. Another development has been the offer of chequing privileges as well as a market rate of interest on accounts above a certain level. All these developments have contributed, if not to economies of M_1, to uncertainties in interpreting its movements. The authorities hope in time to devise a transactions aggregate which would be a reliable substitute.

D. Monetary policy and inflation

While few would question the proposition that in the long run inflation is a monetary phenomenon, it is far more difficult to say whether monetary policy has *directly*[1] affected inflation during the shorter periods considered in this paper. This is particularly so in small and open economies, as international price developments are bound to have a major impact regardless of the current stance of monetary policy.[2]

Nonetheless, changes in the money supply may still act as a determinant of inflation; without any claim to deliver "the final verdict", Table 10 presents some tentative estimates for the period 1964–81. Firstly, for each country changes in the GDP and private consumption deflators were regressed on changes in the broad and narrow monetary aggregates (subject to various lags) and in foreign prices[3] Secondly, this simplistic monetarist approach was replaced

[1] As distinct from indirect effects stemming from changes in the level of economic activity.

[2] It is of course possible to offset external influences through changes in monetary policy and exchange rates, but for the 1970s this would have required a very severe tightening of the monetary policy stance. In this respect Jonung's (1976) study for Sweden is of interest. Thus, for longer periods (more than two hundred years) there is a positive correlation between changes in prices and in the money supply. However, over shorter periods, and especially after the Second World War, Jonung finds a negative correlation between contemporaneous changes in the money stock and in prices and he interprets this result as indicating a timely counter-cyclical policy on the part of the Swedish monetary authorities.

[3] This variable was measured as changes in the ratio between import and export prices (national accounts deflators), so that, a priori, the coefficient can be expected to be positive for consumer prices and negative for the GNP deflators. In a number of cases these coefficients were not very well determined and a specification with separate changes in export and import prices rather than in their ratio might have been more appropriate.

by a mark-up hypothesis as the change in unit labour costs (current and lagged) was entered and tested as the main determinant of prices.

For all four countries there is a significant and positive impact of either current or lagged changes in the money supply, and in both Canada and Belgium these explain 50–60 per cent. of the observed movements in prices,[1] while for Sweden and Austria the share which can be related to the money supply is considerably smaller. Except in the case of M_1 in Sweden, lagged changes in the money supply are more important than current changes, and in Belgium and Canada the broad aggregates give far better results than M_1.[2] However, in several cases the estimates are suggestive of "missing variables", and for all four countries – but least for Canada – the mark-up hypothesis yields more satisfactory results.[3]

Given the long-run relationship between money and prices, changes in nominal wages cannot permanently influence the rate of price inflation unless subsequently validated by faster growth in the money supply. Hence unit labour costs may only be acting as a proxy for a monetary policy which is accommodating with respect to nominal wages. However, the empirical evidence does not support this hypothesis, as a regression of changes in the domestic credit supply on current and lagged changes in nominal wages produced

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[1] For Canada, the estimates obtained for M_1 are quite close to those reported by Bordo and Choudhri (1982), who find a coefficient with respect to M_1 (lagged twelve quarters) of 1.1 and an R^2 of 0.6. It may also be noted that the incomes policy dummy gives rather different results depending on which hypothesis is tested. According to the mark-up hypothesis price changes during this period were higher than predicted by unit labour costs, supporting the view (see the following section) that real wages were squeezed. However, according to the monetarist hypothesis price rises were slower than would have corresponded to the rate of growth of M_2, whereas they were in line with the growth of M_1. This may suggest that monetary policy, as measured by M_2, was not fully consistent with the inflation target during this period.

[2] In the case of Canada, however, it is questionable whether this can be taken as evidence that M_2 would have been a more appropriate target than M_1. Firstly, there was a shift in the demand for M_1 in 1976–77, which is not taken into account. Secondly, the relatively high explanatory power of M_2 may reflect a reverse causal relationship between nominal income and M_2.

[3] Similar results for the United States are reported by Ando et al. (1983).

very low R^2s and no significant coefficients. It would, therefore, appear that in all four countries price changes in the short to medium run are mainly determined by unit labour costs and other input

Table 10
Money supply and price inflation, 1964–81

Countries		Main deter-minant	Current	1 Lag	2 Lags	$\Delta \dfrac{IMP}{EXP}$	Dummy	R^2	DW
Austria	GP	M_1	0.11 (1.9)	0.16 (2.6)	0.12 (1.9)	0.36 (1.9)		0.37	0.8
		M_3	–	0.08 (0.4)	0.09 (0.5)	0.22 (0.7)		–0.17	0.4
		ULC	0.08 (1.0)	0.28 (3.5)	–	–		0.57	1.4
	CP	M_1	–	0.13 (1.7)	0.13 (1.6)	0.40 (1.7)		0.17	1.1
		M_3	0.10 (0.5)	0.01 (0.2)	–	0.33 (1.1)		–0.11	0.5
		ULC	0.16 (2.0)	0.28 (3.4)	–	0.34 (2.2)		0.66	1.3
Belgium	GP	M_1	–	0.21 (1.5)	0.52 (3.3)	–		0.49	1.4
		M_2	–	0.19 (1.4)	0.57 (3.9)	–		0.56	1.4
		ULC	0.15 (2.1)	0.45 (5.9)	–	–0.27 (1.2)		0.80	1.4
	CP	M_1	–	0.32 (2.3)	0.44 (2.9)	1.01 (3.2)		0.59	1.7
		M_2	–	0.23 (1.6)	0.50 (3.2)	0.73 (2.3)		0.57	1.3
		ULC	0.23 (2.8)	0.38 (4.5)	–	0.23 (1.0)		0.78	1.5
Canada	GP	M_1	–	0.30 (1.4)	0.57 (3.7)	–0.20 (1.0)	–	0.56	0.8
		M_2	–	0.36 (2.6)	0.50 (3.4)	–0.26 (1.5)	–3.83 (1.7)	0.66	1.9
		LIAB	–	1.02 (4.6)	–	–0.45 (2.6)	–1.80 (0.8)	0.62	1.2
		ULC	–	0.60 (8.2)	–	–0.59 (5.5)	3.00 (2.5)	0.85	1.9
	CP	M_1	–	0.33 (1.4)	0.47 (2.4)	0.21 (1.0)	–	0.34	0.6
		M_2	–	0.35 (2.5)	0.48 (3.1)	0.15 (0.8)	–3.91 (1.7)	0.50	1.6
		LIAB	–	1.00 (4.5)	–	–	–2.21 (1.2)	0.55	1.2
		ULC	–	0.55 (5.5)	–	–	1.80 (1.3)	0.66	1.4
Sweden	GP	M_1	0.26 (2.3)	0.16 (1.4)	–	–0.23 (1.3)		0.31	1.3
		M_2	–	–	0.70 (2.6)	–0.18 (1.0)		0.26	0.7
		ULC	0.13 (1.2)	0.52 (4.9)	–	–0.11 (0.9)		0.70	2.4
	CP	M_1	0.28 (3.0)	0.11 (1.2)	–	–		0.39	1.3
		M_2	–	–	0.67 (2.9)	–		0.32	0.6
		ULC	0.13 (1.1)	0.42 (3.5)	–	0.10 (0.7)		0.53	1.3

Notation: GP = GDP deflator, percentage change. CP = Consumption deflator, percentage change. M_1 = narrow money stock, percentage change. M_2, M_3 = broad money stock, percentage change. ULC = unit labour costs, percentage change. LIAB = banking system's total liabilities, percentage change. $\Delta \dfrac{IMP}{EXP}$ = ratio between import and export prices, year-to-year change. DUMMY = 0.5 for 1976, 1 for 1977 and 1978, otherwise 0. All equations contain a significant intercept term which is not shown in the table.

prices. In the longer run, price changes are constrained (but not necessarily "caused") by money supply growth, and there is little evidence that "the reaction function" of the monetary authorities involves an automatic accommodation of preceding changes in wages. In turn, these findings have important implications for wage behaviour, which will be further pursued in the following section: firstly, in the short to medium term, which is frequently the relevant time horizon for policy decisions, inflation will be closely related to – and sometimes caused by – nominal wage changes; and secondly, to the extent that the money supply and changes in domestic credit are independent of preceding movements in nominal wages, the flexibility of nominal and real wages will greatly influence the degree to which external shocks have repercussions on real output trends and unemployment.

E. Wage behaviour and the adjustment to external shocks

Owing to the type of shocks occurring in the 1970s, policy-makers in all four countries have been faced with the problem of enforcing a downward adjustment of real wage growth. Failure to achieve such an adjustment would result in inflationary pressures, loss of international competitiveness and changes in the distribution of factor income. However, the supply shocks experienced by the four countries have differed in both nature and size, as is apparent from a brief review of changes in productivity and the terms of trade. The associated developments in real wages, international competitiveness and income shares are then discussed in order to form a preliminary impression of how the adjustment process unfolded and whether policies have relied on internal (demand management and incomes policies) or external (exchange rate adjustments) measures. A third section then analyses the major determinants of nominal and real wages and attempts to assess the degree of wage flexibility and the extent to which the inflationary repercussions of the external shocks could have been offset through more labour-market slack.

(a) *Productivity and the terms of trade*

From Table 11 it can be seen that in Austria and Belgium the major external shock was the adverse terms-of-trade shift, while productivity growth remained relatively high, particularly in the Belgian manufacturing sector. Much of the deterioration in productivity growth took place in 1980–81, the same being true of the change in the terms of trade in Belgium, whereas Austria suffered equally large deteriorations after both oil shocks. In Canada and Sweden, on the other hand, the external shocks mainly took the form of a marked slowdown in productivity growth. In fact, Canada, being a major producer of non-oil raw materials and self-sufficient in energy, saw a terms-of-trade improvement for 1972–81 as a whole, while Sweden had already eliminated the adverse effects of the first oil shock by 1975.

There have, of course, been other forces affecting wage and income share developments, among which might be mentioned the strong rise in non-wage labour costs (NWLC). As can be seen from Table 12, these now correspond to 35–90 per cent. of wages, and over the 1965–82 period they contributed between 2.1 (Canada) and

Table 11

Changes in productivity and the terms of trade

Countries	Productivity[1]				Terms of trade[2]	
	Total economy		Manufacturing			
	1965–73	1974–81	1965–73	1974–81	1965–73	1973–81
	Average annual percentage change				percentage change times foreign trade share	
Austria[3]	5.3	2.3	6.4 (n.a.)	2.2 (3.3)	0.3	−4.2
Belgium	4.2	2.1	7.1 (8.6)	4.3 (6.1)	1.1	−6.7
Canada	2.4	0.2	3.8 (4.8)	0.3 (1.1)	0.0[4]	0.8[4]
Sweden	2.8	0.5	5.3 (6.4)	0.7 (2.0)	0.0	−2.7

[1] Output per person (output per hour given in brackets).   [2] Calculation based on national accounts deflators.
[3] All industry, including transport and construction. First period covers 1967–73 only. For the manufacturing sector alone, the output figures are 7.3 and 2.3 for 1967–73 and 1974–81 respectively.   [4] Calculated for the periods 1965–72 and 1972–81.

Sources: OECD, IMF and national data.

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Table 12

Wages and total labour costs

Countries and items	DM per hour, manufacturing				
	1965	1970	1975	1978	1982
Austria					
Wages	2.37	3.21	6.13	7.62	9.99
Non-wage labour costs	1.65	2.41	5.04	6.53	9.05
Total labour costs	4.02	5.62	11.17	14.15	19.04
NWLC as a percentage of wages .	*69*	*75*	*82*	*86*	*91*
Belgium					
Wages	3.49	4.76	9.58	12.01	13.84
Non-wage labour costs	1.68	2.82	6.86	9.55	10.51
Total labour costs	5.17	7.58	16.43	21.56	24.35
NWLC as a percentage of wages .	*48*	*59*	*72*	*80*	*76*
Canada					
Wages	8.88*	10.54	12.27	12.07	20.12
Non-wage labour costs	1.60	2.09	2.87	3.41	7.04
Total labour costs	10.48	12.63	15.13	15.48	27.16
NWLC as a percentage of wages .	*18*	*20*	*23*	*28*	*35*
Sweden					
Wages	6.20	8.54	12.67	12.50	15.23
Non-wage labour costs	1.45	2.41	6.01	7.68	10.17
Total labour costs	7.65	10.95	18.68	20.18	25.40
NWLC as a percentage of wages .	*23*	*28*	*47*	*61*	*67*

* 1967

Sources: Swedish Employers' Confederation and Institute der Deutschen Wirtschaft.

4.8 (Austria) percentage points (average annual rates) to the rise in total labour costs. However, the extent to which this can be interpreted as an external factor is somewhat doubtful.* Thus, some components of NWLC substitute for earnings, and their increase is likely to be offset by a corresponding moderation in wage claims. Secondly, except in Canada, the contribution of NWLC to the rise in total labour costs decelerated after 1973, and in Belgium the share of NWLC actually fell in 1982. On the other hand, much of the recent rise in NWLC (especially in Sweden) can be ascribed to higher

* Productivity changes also contain a large endogenous component related to cyclical factors and employment adjustments to rising wage costs.

payroll and other taxes imposed on employers, which are only partly offset by lower earnings.[1] Nonetheless, even if NWLC may not have acted as a "shock", their development is likely to have influenced countries' international competitiveness as well as the rigidity of total wage costs.

(b) *Developments in income shares and competitiveness*

Turning to Graph 5, all four countries are seen to have experienced a shift in the distribution of factor income in favour of wages over the period 1973–81, as real wages increased faster than output per person.[2] The shift was most pronounced in Belgium and least in Canada and Austria, with Sweden occupying an intermediate position. However, these aggregate shifts took place against a background of relatively large differences in real growth and inflation rates as well as in sectoral and sub-period developments. In several respects these differences are more revealing of the adjustment process.
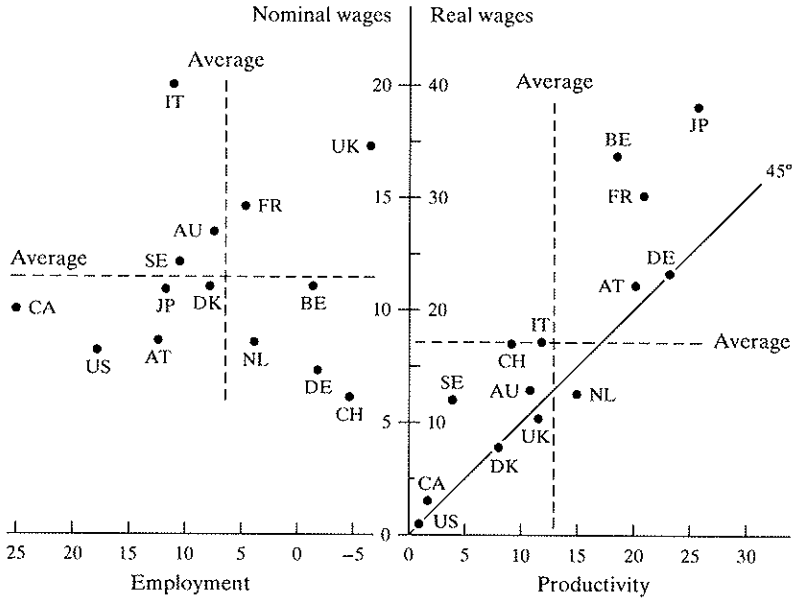
Firstly, as can be seen from the left-hand side of Graph 5, the weak productivity performance in Canada and Sweden was accompanied by strong employment gains, while nominal wage increases were low in Canada and high in Sweden. Austria has recorded some rise in employment (particularly when measured by the number of wage and salary-earners) and low nominal wage gains, while Belgium experienced a decline in employment with average nominal wage gains. Although it can be misleading to interpret such trends as indicating causal relationships, the development in Belgium is suggestive of high and rigid real wages leading to employment cuts in the least efficient firms and a rise in

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[1] According to a recent study, some 50 per cent. of the rise in payroll taxes in Sweden has been "absorbed" in lower wage earnings (see Holmlund (1983)). The figures given in Table 12 do not include all NWLC but are the most comprehensive on an internationally comparable basis.

[2] By implication the share of non-labour income declined. In the following this is used as an indicator of profit share developments, although changes in interest rates and other non-labour costs have not been taken into account.

Graph 5

Wages, employment and productivity (1973–81)

Nominal wages | Real wages

Average

IT

UK •

Average

BE
JP
45°

FR •

AU •

Average

SE •

DE

AT •

• CA

JP   DK

BE

IT

Average

US

AT

NL

CH

DE

SE   AU •   • NL

CH

UK

CA

DK

US

Employment: 25 20 15 10 5 0 −5 0 5 10 15 20 25 30

Productivity

Note: Productivity, real wages and employment shown as the cumulative percentage change during 1973–81. Nominal wages measured as average annual percentage change over the same period.
For country abbreviations, see page 13; in addition, CH = Switzerland.

average productivity. In Canada, on the other hand, real wages appear to have been flexible, permitting strong employment gains at falling productivity increases. Austria is more difficult to interpret on the evidence of Graph 5 alone, while in Sweden a wide range of labour-market measures contributed to the strong employment growth as well as to the weak productivity performance.

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Secondly, the sectoral developments (see Tables 13a and 13b) have differed both across countries and with respect to changes in output, employment and inflation rates. In *Belgium* the shift in favour of wages appears to have been particularly pronounced in the non-manufacturing sectors. For the total economy, the share of wage compensation in net factor income increased from 62½ to 74½ per cent. between 1970 and 1981, while in the manufacturing industries, after heavy losses immediately following the first oil price shock, the decline in profit shares was around 9 percentage points. However, since this occurred in conditions of weak output growth and a substantial decline in employment, total profits must have

Table 13
Output and labour-market trends[1]
(average annual percentage change)
a. Output and employment

Countries	Manufacturing				Whole economy			
	1965–73		1974–81		1965–73		1974–81	
	O	E	O	E	O	E	O	E
Austria[2]	7.2	0.8	2.4	0.3	5.7	0.4	2.6	0.3
Belgium	7.1	0.0	0.9	−3.4	4.9	0.7	1.9	−0.2
Canada	5.9	2.1	1.7	1.3	5.5	3.1	3.0	2.8
Sweden	4.0	−1.3	−0.2	−0.9	3.4	0.6	1.6	1.1

b. Wages, prices and productivity (1974–81)

Countries	Manufacturing				Whole economy			
	W	P	RW	PR	W	P	RW	PR
Austria[2]	9.0	5.2	3.6	3.3	8.6	5.9	2.6	2.3
Belgium	12.8	5.3	7.1	6.1	11.0	7.1	3.6	2.1
Canada	11.5	10.7	0.7	1.1	10.5	10.1	0.4	0.2
Sweden	13.5	10.5	2.7	2.0	12.1	10.5	1.5	0.5

[1] O = Output; E = Employment; W = Compensation per hour (manufacturing) or person (whole economy); P = Output prices; RW = Real wage costs (W less P); PR = Productivity, output per hour (manufacturing) or per person (whole economy). [2] See note 3, Table 11.

Sources: OECD, IMF and national data.

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fallen significantly, and the strong rise in productivity is not to be interpreted as a source of strength but rather as the outcome of a retrenchment process.[1] One feature of wage formation in Belgium has until recently been a high degree of real and nominal wage rigidity, and a high export share in manufacturing output combined with a fixed exchange rate policy has constrained firms' ability to raise output prices. By contrast, in *Canada* and – to a slightly smaller extent – in *Sweden*, output prices in manufacturing have increased as fast as the overall GNP deflator, and in Canada the profit share in manufacturing rose during the 1970s.[2] However, output prices in both countries have been very volatile (owing to developments in world market prices as well as to major changes in exchange rates), producing large shifts in profit shares and probably adding an element of instability to output and wage formation. For instance, in Sweden the gross profit share in manufacturing rose to 30.5 per cent. in 1974 as wage-earners moderated their claims immediately following the first oil price shock, while producers benefited from the surge in world commodity prices. Over the next three years, however, the profit share fell to only 15.5 per cent. as unit labour costs accelerated and the rise in output prices fell sharply. Following the introduction of a more flexible exchange rate policy in 1977, output prices and profits recovered somewhat, but by 1981 the gross profit share was still considerably below the average for the 1960s, and total profits had declined substantially as Swedish industries – alone among the OECD countries – experienced negative output growth for the 1973–81 period. Finally, in *Austria* a high rate of real output growth combined with balanced sectoral changes, a rapid moderation in nominal wage increases, and only minor changes in sectoral and overall factor shares point to a smooth adjustment process. Profit shares declined somewhat after the first oil price shock, and profit conditions in manufacturing industries were

[1] Between 1973 and 1981 the share of manufacturing in total output dropped from 30½ to 24⅓ per cent.

[2] By 1980 the gross operating surplus had attained 36.7 per cent. of manufacturing value added, compared with an average of 31.9 per cent. in 1967–73.

probably less favourable as the average rise in output prices – reflecting a large export element and a fixed exchange rate policy – was 1 percentage point below that for total industry during the 1973–81 period.

Thirdly, exchange rate developments and policies have – through their influence on firms' ability to pass on cost increases – significantly affected factor shares and the adjustment process in general. This has already been discussed in earlier sections but can also be seen from Graph 6,* which allows changes in international competitiveness to be allocated between internal and external factors. Turning first to domestic factors, Canada has suffered an almost continuous deterioration in its relative cost position, while Sweden experienced a marked worsening during 1975–78 and a major improvement thereafter. Belgium and Austria, on the other hand, have recorded significant gains, with average increases in unit labour costs in 1973–81, at 6.4 per cent. and 5.4 per cent. respectively, only about half the rates recorded in Sweden (11.3 per cent.) and Canada (10.2 per cent.).

However, adjustment for exchange rate movements changes the picture dramatically, particularly when looking at developments before and after 1978. In Austria domestic factors would have improved the competitive position by around 20 per cent. over the 1966–78 period, but the actual change was a deterioration of nearly 15 per cent. as the effective exchange rate appreciated by some 40 per cent. In Canada, exchange rate movements partly reflect a lagged response to past inflation and this led to an improvement in relative unit labour costs of 10 per cent. over the 1966–78 period, while domestic factors alone would have caused a deterioration. Sweden and Belgium occupy intermediate positions: in the former country an effective depreciation reduced the loss in competitiveness due to domestic developments but did not turn it into a gain, while in Belgium an effective appreciation reduced the gain due to domestic

* A similar analysis based on hourly wage costs is presented for a larger number of small European countries by Calmfors (1982).

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Graph 6

Unit labour costs, effective exchange rates and competitiveness

——— Unit labour costs (national currency)
— — Effective exchange rates
——— Unit labour costs (common currency)
—— —— Output prices (common currency)
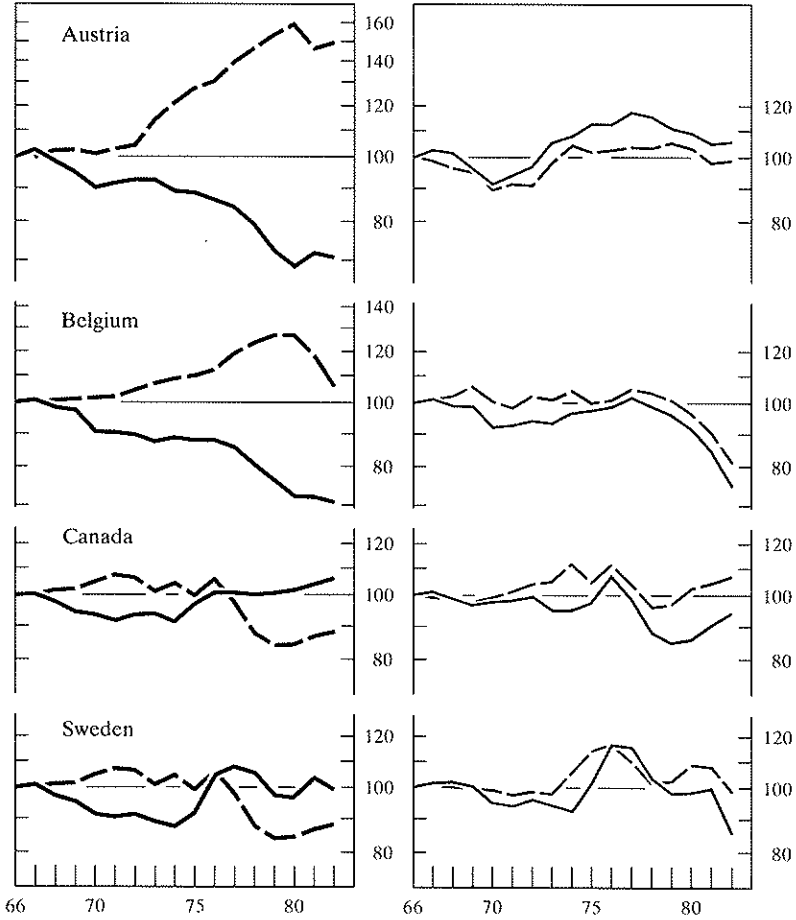
Semi-logarithmic scale.

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factors but did not turn it into a loss. In the period after 1978 several of these trends were sharply reversed. In Austria and Belgium domestic factors continued to be favourable, and their effect on international competitiveness was reinforced by an effective depreciation, which in the case of Belgium amounted to 15 per cent. over the 1978–82 period. In Canada unfavourable domestic factors continued and were aggravated by an effective appreciation, while Sweden shows the most dramatic improvement over this period, with a sharp deceleration in unit labour costs combining with several devaluations to more than restore the 1973 level of competitiveness.

By 1982 relative unit labour costs in Austria and Canada were back at their 1973 levels, while Belgium and Sweden had experienced real effective depreciations of around 20 and 10 per cent. respectively. In both cases this improvement in international competitiveness had, as noted above, occurred as the combined result of wage moderation and exchange rate depreciation, though Sweden implemented the latter at a much earlier date than Belgium. Considering that Canada and Austria provide two extreme examples with respect to changes in relative unit labour costs in national currencies, and that both Belgium and Sweden had experienced very large market share losses domestically as well as abroad,* these various trends raise two important questions with respect to the adjustment process and the underlying policies:

– what have been the exchange rate policies of the four countries and in which way have they been co-ordinated with demand management and incomes policies?
– to what extent have wage rigidities and wage behaviour influenced the adjustment to external shocks and the effectiveness of exchange rate changes as a policy instrument?

Policies have been discussed above and the second of these questions will be addressed in the next section.

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* For instance, the share of imports in the supply of manufactured goods in Belgium increased from 59 to 85 per cent. between 1970 and 1980.

(c) *Nominal and real wage behaviour*

The behaviour of nominal and real wages and the degree of wage flexibility – or rigidity – have naturally played a central rôle in the analysis of the adjustment process in various countries. As discussed in the Annex, there is no generally agreed measure of wage flexibility, though the extent to which countries are likely to achieve a smooth adjustment would seem to depend on the following aspects of the wage formation process:

– the response of real and nominal wages to changes in productivity growth, since in the absence of a complete absorption there will be changes in the distribution of factor income and in inflationary pressures;

– the cyclical sensitivity of nominal and real wages, which affects the effectiveness of anti-inflationary policies;

– the existence of time lags in the wage and price formation process, which not only creates a difference between the short and the long-run slope of the Phillips curve but also affects the speed with which restrictive policies will reduce the rate of inflation;

– the extent to which nominal wages are linked to current price changes or to past wage changes (wage/price vs. wage/wage links), which has a major influence on the impact of terms-of-trade changes as well as on the average time lags.

The general trends in real earnings, productivity, unemployment and the terms of trade are shown in Graph 7; Tables 14 and 15 present some regression results in an attempt to identify major wage determinants. For each country, five[1] equations are shown with the following specifications:

(i) in the first equation, nominal wage changes in manufacturing industry are regressed on current or lagged values of the rate of unemployment,[2] changes in consumer prices, changes in

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[1] A sixth equation based on the real wage hypothesis (see Annex) was also tested, but except for Austria the signs of the coefficients did not correspond to a priori expectations.

[2] Equations entering the inverted rate of unemployment were also tested, but in all cases the results obtained seemed less satisfactory.

Table 14

Wage equations: Nominal wages

Countries	Constant	$\dot{p}$	$\dot{p}^e$	u	q	TOT	$\dot{w}_{-1}$	Dummy	$\bar{R}^2$	DW
Austria	10.50 (1.6)	0.70 (1.7)		−2.79 (1.2)	0.11 (0.4)	0.65 (2.4)			0.47	1.7
	8.10 (1.4)		1.19 (2.5)	−3.56 (2.2)	0.39 (1.4)	0.71 (2.9)			0.57	1.2
	7.60 (1.4)		0.70 (1.2)	−3.50 (2.2)	0.41 (1.5)	0.56 (2.1)	0.32 (1.3)		0.59	1.5
	7.86 (2.5)		0.67 (2.9)	−3.54 (2.6)	0.40 (1.7)	0.55 (2.3)	0.33 (−)		(0.48)	1.5
Belgium	5.43 (2.5)	1.31 (8.3)		−0.76 (3.6)	0.12 (0.6)	−			0.84	1.1
	3.65 (0.7)		1.18 (2.7)	−0.70 (1.6)	0.45 (1.0)	−			0.33	0.8
	5.95 (2.1)	1.39 (4.4)		−0.86 (4.2)	0.10 (0.4)	−	−0.06 (0.3)		0.83	1.2
	8.36 (2.8)	0.96 (4.4)		−1.17 (2.3)	0.35 (1.3)	−0.20 (0.8)	0.04 (−)		(0.62)	1.4
Canada	17.70 (6.6)	0.01 (0.0)		−0.64 (1.7)	−	0.63 (5.9)		−2.54 (2.3)	0.85	1.8
	16.78 (5.3)		0.13 (0.5)	−0.71 (1.9)	−	0.57 (4.1)		−2.27 (2.2)	0.82	1.6
	9.10 (2.8)		0.16 (0.7)	−0.58 (2.0)	−	0.30 (2.3)	0.58 (3.2)	−3.65 (3.9)	0.91	2.1
	6.17 (3.1)		0.35 (2.7)	−0.56 (2.0)	0.12 (1.3)	0.22 (3.4)	0.65 (−)	−3.88 (4.3)	(0.83)	2.4
Sweden	9.26 (3.7)	0.71 (4.3)		−0.42 (0.4)	−	0.42 (3.0)		−2.38 (2.4)	0.55	3.1
	12.67 (3.4)		0.70 (2.5)	−2.59 (1.5)	−	0.29 (1.6)		−1.53 (1.2)	0.39	2.7
	15.91 (4.4)		1.01 (3.6)	−2.72 (1.8)	−	0.36 (2.9)	−0.46 (2.1)	−1.83 (1.7)	0.47	1.6
	13.30 (3.7)		1.35 (5.9)	−3.13 (1.9)	−	0.40 (2.5)	−0.35 (−)	−2.16 (1.8)	(0.70)	1.9

Notation: $\dot{p}$ = percentage rate of change in consumer prices; $\dot{p}^e$ = expected percentage rate of inflation; u = percentage rate of unemployment; q = percentage rate of change in output per hour; TOT = ratio between export and import prices, unit values except for Austria; $\dot{w}_{-1}$ = dependent variable, lagged; $\bar{R}^2$ = coefficient of determination corrected for degrees of freedom; DW = Durbin-Watson statistic; t-statistics given in brackets.

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Graph 7

Terms of trade, productivity, earnings and unemployment

⊏⊐ Terms of trade, percentage deviation (1975 = 100)
▬▬ Productivity in manufacturing, percentage change
──── Real earnings in manufacturing, percentage change
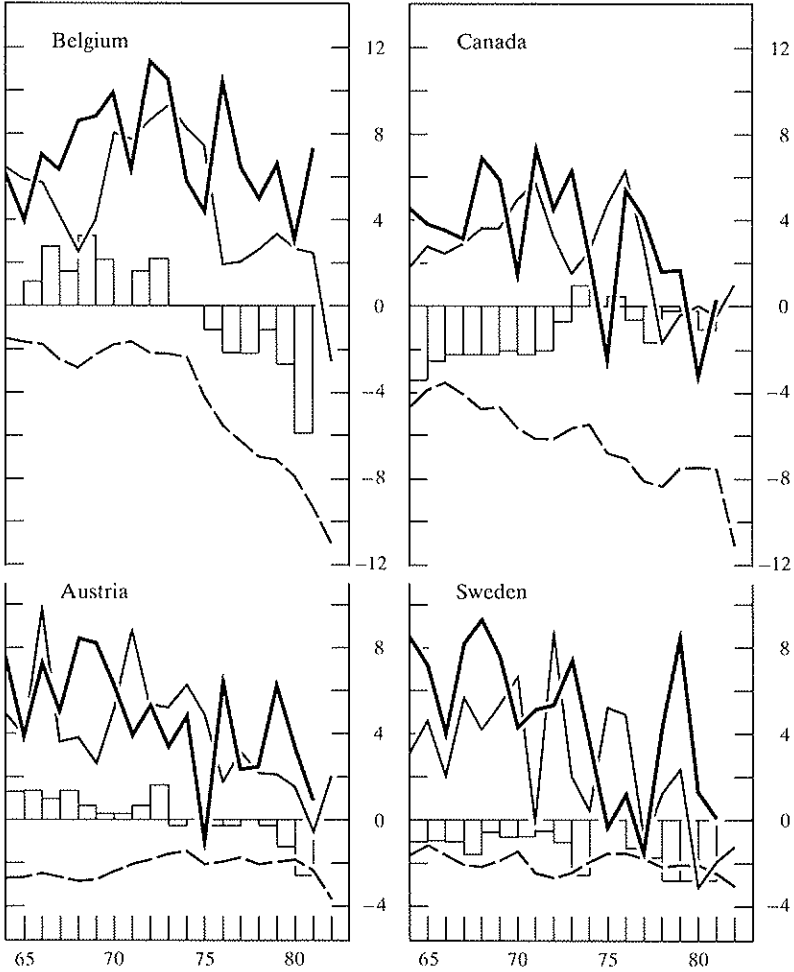▬ ▬ Unemployment rate (inverted scale)

Table 15
Wage equations: Real wages

Countries	C	u	$\dot{q}$	TOT	$\dot{p}-\dot{p}^e$	Dummy	$\bar{R}^2$	DW
Austria ..	9.40 (2.7)	−3.48 (2.0)	0.31 (1.1)	0.68 (2.9)	−0.82 (1.8)		0.36	1.3
Belgium ..	7.35 (3.6)	−0.66 (3.4)	0.06 (0.3)	−	0.56 (2.5)		0.61	1.7
Canada ..	9.22 (3.8)	−0.93 (2.6)	−	0.15 (1.6)	−0.81 (3.1)	−1.07 (0.8)	0.56	0.9
Sweden ..	8.11 (2.7)	−1.28 (0.8)	0.20 (1.3)	0.45 (3.1)	−0.41 (1.7)	−2.55 (2.5)	0.69	3.2

Note: $\dot{p}-\dot{p}^e$ is included as a proxy for unanticipated inflation.

productivity and the ratio between export and import prices.[1] The terms of trade were included in both level and rate of change form, but for all countries the level specification produced the most satisfactory results. This may reflect the fact that only major changes in the terms of trade lead to adjustments in wage behaviour while the influence of minor changes is captured by consumer prices;

(ii) in the second equation current price changes are replaced by one-period lagged price changes as a proxy for inflationary expectations;[2]

(iii) the third equation adds lagged wage changes to capture wage/wage links, and in the fourth equation the sum of the coefficients on prices and lagged wages is constrained to unity as an approximate test for the existence of a long-run vertical Phillips curve;

(iv) finally, the real wage equations shown in Table 15 were based on the specification of the first nominal wage equation except that a measure of unanticipated inflation (defined as actual price changes less inflationary expectations as measured above) was added.

In *Austria* current wage changes seem to be influenced by price expectations and by lagged wages in the ratio of 2:1. The significant influence of lagged nominal wage changes may reflect the bargaining

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[1] Two measures were used for this variable: the ratio between export and import unit values and the ratio between export and import national accounts deflators.

[2] This is, of course, a very simplistic scheme, but at the very least it serves to remove the simultaneity bias contained in the first equation.

pattern, with the exposed sectors often acting as wage leaders, and the coefficient on terms of trade could be interpreted in a similar way, as it suggests that higher import prices lead to wage moderation, while higher export prices result in an acceleration of wage claims. Approximately 40 per cent. of productivity changes are reflected in nominal wage gains, and the coefficient with respect to unemployment would imply that a one percentage point rise in the rate of unemployment leads to a 3½ point reduction in the rate of wage inflation. However, this coefficient is likely to be biased and not representative of recent trends since for the estimation period the rate of unemployment ranged only between 1.5 and 2.9 per cent., while by the end of 1982 it had reached 5.4 per cent.[1] The estimates are not inconsistent with a vertical long-run Phillips curve, but given the large sensitivity of nominal wages to foreign price trends it is probably more relevant to interpret the "trade-off" as a single point or a very narrow range on a negatively sloped Phillips curve.[2] The sensitivity to foreign prices as well as the importance of wage/wage links are also apparent in the real wage equation as there is a large positive coefficient with respect to TOT and expectational errors are almost fully reflected in real earnings. The cyclical sensitivity would again appear to be overstated, while the elasticity with respect to productivity changes implies cost pressures and declining profit shares in periods of below-average productivity gains.

The estimates for *Belgium* show a marked contrast to those obtained for Austria, with nominal wages dominated by current price changes and neither the terms of trade nor lagged wages appearing to have any influence. This result can probably be explained by the indexation scheme in effect until 1982 (though the simultaneity bias is likely to overstate the influence of prices), and

[1] On the other hand, Frisch (1982), using a specification very similar to that used in Table 14 except that TOT is excluded, finds a coefficient of 2.9 when the number of unemployed is measured net of vacancies and expressed as a percentage of total employment.

[2] The same argument applies to the Canadian and Swedish results reported below.

the implied rigidity of real wages with respect to "external shocks" is confirmed in Table 15, as there is a positive coefficient with respect to unanticipated inflation. Both nominal and real wages display some cyclical sensitivity and the estimates might be interpreted as giving relatively strong support to a vertical long-run Phillips curve.

A main feature of wage formation in *Canada* appears to be the predominance of wage/wage links, while changes in consumer prices have only a small and insignificant influence.[1] The cyclical sensitivity is relatively small, and productivity does not appear to affect either nominal or real wages. As in Austria, terms-of-trade shifts have a marked influence on wage behaviour, and the improvement in the terms of trade has contributed to the post-1973 surge in wages.[2] Moreover, because of the apparently strong wage/wage links the rise in raw material and oil prices is likely to have added to wage-cost pressures for manufacturers of finished goods. On the other hand, and assuming that export prices rose less than import prices, the flexibility in relation to foreign prices may have helped to improve firms' international competitiveness in periods when the Canadian dollar was depreciating.

Following a suggestion made by Fortin and Newton (1982), a dummy variable with the values ½, 1 and 1 for 1976, 1977 and 1978 respectively was included as a proxy for the wage and price controls introduced in October 1975. Judging by the size of the coefficients, these measures on average reduced nominal wage gains by 2.5 to 3.9 percentage points and the rise in real earnings seems to have fallen by 1 point per year, giving some support to the charge made by unions that the policies were biased in favour of profits.[3] The equation is considerably improved when the dummy variable is included, and the estimated impact is in line with those obtained in

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[1] A similar result is obtained by Fortin and Newton (1982) for the period 1954–79.

[2] In addition, the high volatility of foreign prices and domestic producer prices in the 1970s may have lent an inflationary bias to the wage formation process.

[3] In this context, it should be noted that import prices, which account for some 40 per cent. of the CPI, were not subject to controls.

other studies.[1] Moreover, the pattern of residuals does not point to any post-control surge in wages, as it is dominated by negative figures (i.e. estimated increases exceeding actual increases).[2] On the other hand, the income policy proxy is a very crude one and may be capturing the effect of slower productivity gains, thus biasing the estimated impact of both variables. Furthermore, with nominal wage increases in most countries peaking in 1975, the negative coefficient on the dummy variable may in part be measuring a deceleration which would have occurred in any case.[3]

The equations obtained for *Sweden* seem to represent an intermediate case. On the one hand, as in Austria and Canada, terms-of-trade shifts affect wage behaviour in line with the assumptions of the Scandinavian theory of inflation, and unanticipated increases in the rate of inflation tend to reduce real wage gains. On the other hand, as in Belgium, there is no indication of wage/wage links, suggesting that centralised agreements rather than the exposed sectors have been "setting the pace".[4] Productivity changes do not appear to affect nominal wages (which is also inconsistent with the Scandinavian hypothesis) and have only a minor effect on real earnings.[5] The cyclical sensitivity of both nominal and real wages is relatively high, but these coefficients are likely to be biased as the rate of unemployment has been kept

[1] See Auld et al. (1979), Reid (1979) and Fortin and Newton (1982).

[2] The residuals for nominal wages, equations 2 and 3, and real wages were as follows:

	NW2	NW3	RW
1979	−0.1	0.2	−0.9
1980	−2.0	−1.0	−1.6
1981	−0.4	−0.1	−0.9

[3] Leaving out the dummy variable, equation 3 yields a residual of only 0.25 for 1976, suggesting that some 85 per cent. of the deceleration was due to other factors. See also Auld et al., op. cit.

[4] However, in the case of Sweden lagged wage changes may be a particularly poor proxy for wage/wage links, and the negative coefficients obtained in equations 3 and 4 could imply that a general settlement which is too low (high) relative to current labour-market conditions subsequently leads to higher (lower) wage drift.

[5] By estimating separate equations for exposed and sheltered sectors Calmfors (1978) finds a significant impact of productivity in the exposed sectors, but the coefficient is only 0.17.

artificially low through employment measures and publicly financed training programmes, thus making the measured rate of unemployment an increasingly inappropriate indicator of labour-market pressures. A dummy variable was included and assigned the value of 1 for years with a general wage settlement[1] as a very approximate test of the possibly dampening effect of tax concessions granted prior to several general settlements during the 1970s. The negative coefficient obtained suggests that some moderation of nominal and real wages has been achieved, but this result should be interpreted with caution as the statistical evidence is not very strong and the dummies could be capturing other influences specific to the settlement years. Moreover, the dummies were not scaled according to the size of the tax concessions,[2] and to the extent that the implied stimulus to demand was not offset by other factors, part of the wage moderation would subsequently be "lost" through a lower rate of unemployment.[3]

Generally, nominal and real wages in all four countries have only partly adjusted to the external shocks, and cyclical responsiveness as well as wage/price and wage/wage links differ widely. This implies that all four countries, though Austria less than the others, were faced with rising inflationary pressures in the 1970s and also that there were large differences in how effectively and quickly these pressures could (in theory, and even more so in practice) have been met by more restrictive policies. This issue will be discussed below, taking account of both the size of the external shocks and the degree of real and nominal wage flexibility. A subsequent section then looks more closely at the most recent wage trends and the extent to which they appear to differ from earlier behaviour.

[1] Years of general settlement (with length of contracts in brackets) were: 1966 (3 years), 1969 (2), 1971 (3), 1974 (1), 1976 (2), 1977 (1), 1978 (2), 1980 (1) and 1981 (2).

[2] Neither the tax concessions nor their likely demand impact are easy to quantify, as they have frequently consisted of reductions in personal taxes accompanied by increases in payroll taxes paid by employers (on the assumption that these would be met by a corresponding reduction in nominal wages) and/or the introduction of measures aimed at reducing post-tax profits or constraining their availability to firms.

[3] In addition, if the coefficient on lagged wages is taken at face value the moderating effect of tax concessions would be reduced through subsequent catch-ups.

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Table 16

Unemployment rates and wage changes
(annual averages, in percentages)

Countries	1965–73			1974–81			Memo: Wage rigidity
	Unemployment		Wage increases	Unemployment		Wage increases	
	Actual	NAIRU		Actual	NAIRU		
Austria	2.4	2.5	9.9	2.0	2.25	9.0	0.2
Belgium	2.1	3.6	10.5	6.3	6.75	11.8	0.8
Canada	4.9	5.4	7.8	7.1	8.70	11.4	0.6
Sweden	2.0	1.9	9.6	2.0	2.10	11.5	0.45

(d) Wage flexibility and the "natural" rate of unemployment

As noted in the Annex, the "natural" rate of unemployment is very difficult to quantify since a complete macro-economic model is essentially required. A much narrower concept is the non-accelerating inflation rate of unemployment (NAIRU), which defines that rate of unemployment at which nominal wages start to accelerate and which, combined with a number of restrictive assumptions with respect to the wage and price formation process, can be estimated from only a small model.

The figures given in Table 16 refer to this narrower concept and were derived from a model which is further explained in the Annex. Because of the rather restrictive assumptions imposed and the statistical uncertainty of some of the estimates, the figures should be interpreted with caution, but with these caveats the results may be summarised as follows:

– in *Austria* the NAIRU seems to have fallen slightly between the two periods as the unfavourable terms-of-trade shifts were "over-compensated" by wage moderation. The deceleration in nominal wage gains is not inconsistent with the assumption of a decline in the NAIRU, since a slight rise in excess demand has been more than offset by other factors;

– in *Sweden* the NAIRU may have increased slightly and this could in part explain the acceleration in nominal wages in the face of a constant actual rate of unemployment. The rise in the NAIRU has

been relatively small because of a low degree of wage rigidity and is mainly due to a deterioration in productivity growth;

– in *Canada* the NAIRU may have increased by 3–3½ points, mainly owing to the decline in productivity growth, which has not been absorbed in lower wage gains. The improvement in the terms of trade has also had an unfavourable influence, and because of a relatively rigid wage behaviour these external shocks have had comparatively large repercussions. The observed acceleration in nominal wages would seem consistent with a marked rise in the NAIRU as the actual rate of unemployment increased by only 2¼ points and incomes policies were found to have a dampening effect in the second sub-period;*

– in *Belgium* the NAIRU seems to have increased by 3 points or more owing solely to adverse terms-of-trade shifts which have not been absorbed in wage moderation. Productivity growth, on the other hand, has played only a minor rôle, since the deceleration was small and largely met by lower wage increases. Belgium also appears to have the most rigid wage behaviour, implying that adverse shocks will have to be met by large increases in unemployment in order to maintain a constant inflation rate. As for Canada the acceleration in nominal wages despite the marked rise in the actual unemployment rate may reflect a smaller degree of excess labour supply.

(e) *Recent wage behaviour*

A main feature of the disinflationary process since the second oil shock has been a marked slowdown in nominal wage gains, which in several countries are now running below pre-1973 rates. This process has been accompanied by a corresponding – and sometimes even larger – moderation in real wage gains, but the fundamental question remains whether this moderation mainly reflects a change

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* Structural changes in the labour market support the notion of a markedly higher NAIRU, as the second period has seen a sharp rise in unemployment benefit rates and minimum wages and in the proportion of wage-earners (women and youths) with above-average unemployment rates.

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Table 17
Recent wage developments, estimated and actual
(percentage change)

Items	1980–81			1981–1982			12 months to end-1982		
	Actual	Esti-mated	Resid-ual	Actual	Esti-mated	Resid-ual	Actual	Esti-mated	Resid-ual
Nominal wages									
Austria (3)* .	6.2	6.2	0.0	6.2	1.2	5.0	4.5	−0.3	4.8
Belgium (1) .	10.1	9.0	1.1	6.1	9.4	−3.3	3.8	8.3	−4.5
Canada (3) . .	12.0	12.1	−0.1	11.7	12.5	−0.8	9.8	12.5	−2.7
Sweden (2) . .	10.2	10.2	0.0	7.5	9.9	−2.4	6.9	7.7	−0.8
Real wages									
Austria	−0.6	0.1	−0.7	1.4	−3.3	4.7	1.5	−3.7	5.2
Belgium	2.5	1.9	0.6	−2.6	1.2	−3.8	−6.1	0.5	−6.6
Canada	−0.4	0.5	−0.9	0.9	2.7	−1.8	0.1	2.8	−2.7
Sweden	−2.0	−2.3	0.3	−1.1	0.7	−1.8	−2.2	−0.6	−1.6

* Constrained version.

in wage determinants or constitutes a deviation from past behaviour. Table 17 attempts to answer this question by presenting actual and estimated nominal and real wage changes in 1981 and 1982 using the most satisfactory equations from Tables 14 and 15. In 1981 there were only minor deviations from earlier trends, except in Belgium, where realised gains exceeded the estimated rates, and in Canada, where there is evidence of real wage moderation.* However, in 1982 (which was not included in the observation period) major deviations occurred:

– in *Austria* both nominal and real gains were running considerably above what past behaviour would have implied. This mainly reflects the sharp rise in the rate of unemployment, but occurred even though the predictions for 1982 constrained the unemployment coefficient to unity, i.e. to less than half the size shown in Table 14;

– in *Belgium*, on the other hand, there was a significant and accelerating moderation in wage behaviour mainly due to the

* Nonetheless, wages in Canada rose more sharply than in other countries.

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suspension of the indexation scheme. Although wage-earners have accepted the need for some modification of the indexation mechanism, it remains to be seen whether wages in 1983–84 and beyond will stay below earlier trends;

– in *Canada* and *Sweden* there is also evidence of moderating wage behaviour, which in the former case is a continuation of the development observed for 1981. It may also reflect the introduction of new incomes policy measures, even though these only applied to public-sector employees. For Sweden the general wage agreement concluded in the spring of this year would suggest that the moderation observed for 1982 is of a more durable nature.

All in all, it would appear that except in the case of Austria there are no compelling reasons to modify the previous equations and their implications with respect to wage behaviour. The deviations observed for Canada and Sweden are within 1–2 standard errors for both nominal and real wages, and in the case of Belgium the earlier wage equation was temporarily suspended together with the indexation scheme.

F. Sectoral financial balances

Another way of illustrating the adjustment process as well as the nature and effect of policies is by looking at changes in sectoral financial balances. As these are derived from ex post national or financial accounts identities, it is difficult to identify causal relationships, and in some cases residual errors and statistical uncertainties are also very large. Nonetheless, by comparing the size and pattern of changes across countries it is possible to form some impression of the external shocks, the policy response and the extent to which rigidities may have affected the adjustment process and behaviour in different sectors.
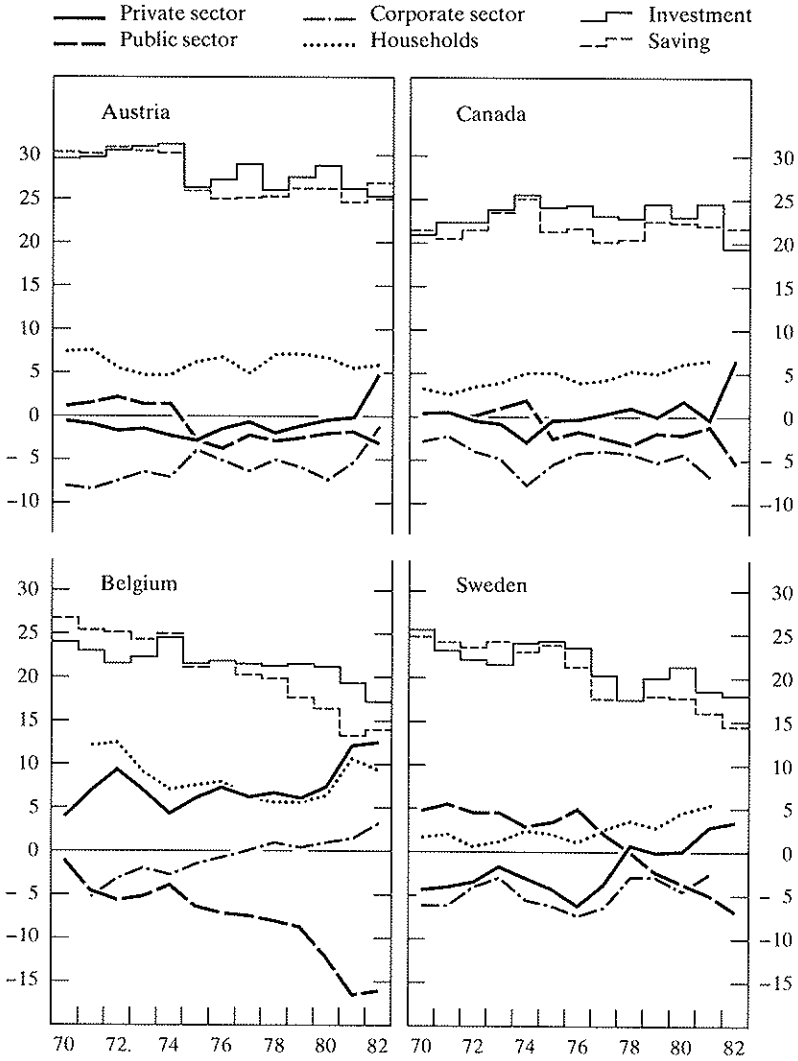
Turning first to gross saving and investment and using the standard national accounts notation for investment (I), saving (S), exports (EX) and imports (IM), the following identity must hold:

(i) $$S - I \equiv EX - IM$$

Graph 8

Saving, investment and sectoral financial balances

as a percentage of GNP

——— Private sector   —··—· Corporate sector   ⎍⎍ Investment

——·—— Public sector   ········· Households   —·⎍·— Saving

Measured relative to GNP, S and I are shown separately in Graph 8, from which it can be seen that two features have to varying degrees characterised developments in the four countries:

- a trend decline in the aggregate savings ratio, which has been most pronounced in Belgium and Sweden (where it fell by 48 and 42 per cent. respectively between 1970 and 1982) but virtually absent in the case of Canada;
- a less pronounced decline in the aggregate investment ratio so that in all four countries the balance-of-payments position worsened. Again Canada is an exception, with a gradually rising investment ratio until the recession last year.

While a pronounced decline in gross aggregate saving relative to investment suggests that externally induced balance-of-payments deficits are accommodated without a reduction in domestic absorption relative to output, more insight into this process may be obtained by disaggregating the saving and investment flows on a sectoral basis. Using subscripts H, C and G to denote the household, company and public sectors respectively, the identity in (i) may be rewritten as:

(ii) $\quad (S_H - I_H) + (S_C - I_C) + (S_G - I_G) \equiv EX - IM$

The bracketed terms are shown in Graph 8 measured relative to GNP. In this context it is relevant to recall the New Cambridge hypothesis, which holds that changes in fiscal policy and in the public sector's financial balance mainly affect the current external account, whereas the financial position of the private sector is stable.[*] This

> [*] Identity (ii) may be further disaggregated on the basis of the various means of financing a sectoral imbalance. The "government budget constraint" (see Christ (1968)) should be seen in this context as it states:
> (iia) $I_G - S_G = M + B + F$
> where M = change in the money stock due to bank financing of the deficit, B = change in the stock of public bonds held by the non-financial sector, and F = change in foreign reserves, including public-sector borrowing abroad. Akhtar et al. (1979) incorporate a government budget constraint into the framework of the New Cambridge hypothesis, and by assuming that the demand for money is stable, that public bond sales to the non-financial private sector are exogenous, and that domestic credit expansion equals bank credit to the public sector, they derive the stated negative relationship between changes in foreign reserves and the public-sector deficit.

hypothesis is based on the experience of the United Kingdom during a period when most disturbances occurred domestically. It may also have validity for small open economies when major disturbances originate on the external side and are accommodated by public-sector deficits, though in this case the causation is reversed.

As shown in the graph, the financial balances of the private sector fluctuated sharply during the 1970s. Again, Belgium and Sweden stand out as extreme cases, with declining investment ratios markedly improving the position of the company sector. In Belgium this helped to raise the surplus for the private sector from around 4 per cent. of GNP to more than 12 per cent. by 1981–82, and in Sweden the financial position of the private sector also improved for the period as a whole though a break occurred around 1977. During the first half of the 1970s the company sector experienced a marked deterioration, but following the introduction of a more flexible exchange rate policy and some moderation in wage behaviour, a considerable improvement took place, so that by 1982 the private sector as a whole was recording a surplus equivalent to 3½ per cent. of GNP. This shift around 1977 is also of interest from the point of view of fiscal policy. The declining public-sector surplus during the early to mid-1970s largely corresponded to the rising deficit on the current external account, whereas after 1977 the accelerating rise in the public-sector deficit largely matched the improvement in the private sector. This might indicate that the public sector was mainly "filling in" for the weakness in private domestic and foreign demand and that the deficit was primarily cyclical. On the other hand, the simultaneous deterioration in the public-sector and external balances in 1982 suggests that structural elements, including crowding-out effects, were far from being negligible. In the Canadian and Austrian cases the New Cambridge hypothesis receives more support, since in both countries the private-sector financial balance shows neither a clear trend nor, until 1982, very pronounced year-to-year variations.

Fluctuations in private-sector financial balances will – through the accounting identity – imply corresponding deviations between

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public-sector deficits and the external account. Causal relationships cannot be derived from these balances, as in periods of large external shocks and worsening labour-market conditions changes in the public-sector deficit may reflect the effect of built-in stabilisers more than discretionary policy measures. However, it is possible to rearrange the data underlying Graph 8 and look for behavioural relationships in terms of Denison's law, which – based on experience in the United States – postulates a stable ratio between private-sector gross saving and aggregate GNP. Rewriting identity (ii) above as:

(iii) $\qquad S_H + S_C \equiv S_P \equiv EX - IM + I_P + (I_G - S_G)$

Denison's law is seen to differ from the New Cambridge hypothesis in that private investment is "moved to the right-hand side" of the identity. The results from estimating S_P as a function of nominal GNP are shown in Table 18. For all four countries the R^2 is very high, but, more importantly, the gross private saving ratio has been very stable in Austria, Belgium and Canada with a marginal saving propensity that in all three countries is 0.21–0.22.[1] This result is remarkable in at least two respects:

– over the period considered there have been large changes in both sectoral saving patterns and the national saving ratio,[2] but for reasons that are difficult to explain these changes have been largely neutral with respect to the aggregate private-sector saving ratio;

– turning to the right-hand side of identity (iii), a stable gross private saving ratio is seen to imply that externally induced fluctuations in the foreign balance and in private investment are "met" by corresponding changes in the public-sector deficit.

[1] For the United States the saving propensity is estimated at 0.14–0.15 and in contrast to the results shown in Table 18 the intercept term is insignificant, implying that aggregate and marginal saving propensities are identical.

[2] In Austria and Canada net household saving as a proportion of gross private saving has increased from 26.3 to 30.9 per cent. and from 22.5 to 46.1 per cent. respectively, and in Belgium household saving including depreciation has increased its share of total private saving from 50 to 78 per cent.

Table 18
Private-sector saving behaviour
Annual data, 1964–81

Countries	Constant	GNP	R^2	DW	Standard error as a percentage of GNP	Saving as a percentage of GNP			
						Min.	(year)	Max.	(year)
Austria	−3.17 (1.1)	0.22 (42.4)	0.99	1.78	1.0	19.7	(1965)	23.0	(1970)
Belgium*	−2.41 (1.6)	0.21 (60.2)	0.99	1.90	0.8	20.8	(1979)	24.3	(1970)
Canada	−3.59 (5.5)	0.21 (66.4)	0.99	1.57	0.8	16.3	(1971)	20.9	(1980)
Sweden	−5.49 (1.7)	0.17 (20.0)	0.94	0.60	2.6	11.4	(1977)	17.6	(1980)

* Equation also includes a significant influence of changes in GNP.

While built-in stabilisers are important and all three countries introduced counter-cyclical discretionary measures, it is, nevertheless, quite surprising that the net effect of these changes should have been a relatively stable gross saving ratio.

In the case of Sweden, on the other hand, there is less support for Denison's law as the gross saving ratio varied considerably over the period considered and the estimated equation is suggestive of "missing variables". Analysing the time pattern of changes in the saving ratio, there appears to be a strong positive correlation with the income share of the company sector, and the accommodating fiscal policy may also have played a rôle. Thus, the change in the public-sector deficit far exceeded the deterioration in the external account,* and even though nominal and real interest rates remained low compared with other countries they were very high relative to the return on investment. Consequently – and despite favourable liquidity and borrowing conditions – there is likely to have been some crowding-out as financial investment replaced real

* In Belgium, too, there was a very high degree of fiscal accommodation, as the deterioration in the financial balance of the public sector was almost twice as large as the decline in the external balance. Fiscal policy, therefore, offset not only external factors but also the increase in net private saving, thereby probably preventing or slowing down the downward adjustment of absorption relative to output. On the other hand, the lack of adjustment and the resulting distortions were also influenced by the rigidity of real wages noted in the previous section, which made it difficult to reduce the external deficit through faster export growth or import substitution and which is also likely to have contributed to the fall in investment.

investment.[1] In addition, the favourable returns on government bonds and the issue of new public debt certificates may have stimulated company savings, particularly after 1977 when the profit situation started to improve.

For all four countries the empirical evidence gives stronger support to Denison's law than to the New Cambridge hypothesis, but at this stage it is probably "safer" to regard this as an "empirical curiosity".[2] In this respect, the robustness of Denison's law across various degrees of openness and variations in the nature and size of external shocks is also remarkable but, again, largely unexplained by the preceding analysis.

III.
Conclusions

To some extent, the differences in economic performance observed among the four countries examined are rooted in differences in their openness and their vulnerability to particular kinds of external shock. The more important factor, however, has been differences in policy approaches and institutional rigidities and constraints. In these respects several conclusions seem to stand out:

1. The experiences of the four countries suggest that a heavy emphasis on any particular aspect of policy – hard-currency, incomes, fiscal or monetary – will generally lead to unsatisfactory results. This conclusion, though perhaps obvious, seems particularly important in the case of small open economies, where a high degree of responsiveness to change is desirable. Conceptually ideal,

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[1] See Jakobsson (1983) for further analysis of this issue.

[2] David and Scadding (1974), who have updated and reconfirmed Denison's law for the United States, propose the view that households and firms are behaving "ultra-rationally" in the sense that they readily substitute company for household saving, public for private consumption and purchases of government bonds for real investment.

however difficult in practice, is a full policy-mix approach. Austria has come closest to achieving this, whereas Belgium has put most weight on a hard-currency policy, Canada on monetary policy and Sweden on fiscal policy.

2. Efforts to keep to a stable exchange rate, if not backed up by appropriate adjustment policies, imply a need for exchange-market intervention. This has occurred on a significant scale and was supported in Belgium and Sweden by substantial borrowing abroad.

3. The lessons for monetary policy are several-fold. As Austria, Belgium and Sweden have insisted, monetary targets of the conventional sort are difficult to apply in a small open economy. Interest rates are more clearly relevant, given the fact of openness, the importance attached to exchange rate stability and the general relevance of changing levels of rates in international markets. However, it was also seen that some attention could usefully be given, in a "monetary approach" to the balance of payments, to some broad concept of domestic credit expansion. Owing to financial innovation, it is not enough to look simply at credit expansion via the banking system. Account has to be taken of flows outside the banks as well as of recourse to borrowing abroad. In this context, financial innovation has been seen to reflect not merely market initiative but also new debt management techniques applied by governments. It is also evident that financial innovation in both these senses – market-induced and policy-induced – can be disturbing both to countries pursuing monetary aggregate targets (such as Canada) and to those emphasising liquidity control.

4. Broadly speaking, four phases of fiscal policy may be identified: strongly expansionary measures to offset the deflationary impact of the first oil shock, fiscal restraint between 1975 and 1978, moderately expansionary measures to meet the second rise in oil prices, and, most recently, retrenchment efforts as budget deficits got out of control. In all four countries fiscal policy changes have played an important rôle in "filling in", or compensating, for concurrent changes in private-sector credit demand and in the external account. Nonetheless, and regardless of whether targets for

monetary aggregates are used in implementing monetary policy, some limitations of fiscal policy have become clearly visible:

– automatic stabilisers may be destabilising in conditions of external supply shocks, of structural as opposed to cyclical changes, and of protracted and deep recession;

– as noted above, an unbalanced policy approach is generally inefficient and fiscal ease is subject to particular difficulties in the current situation of monetary restraint and high nominal interest rates;

– while all four countries have been able to finance fiscal deficits without any excessive growth in the money supply, various strains and imbalances have developed, not least because of the growing burden of interest payments on the public debt. To some extent this development reflects the fact that small open economies have only a limited degree of policy independence, but it also underlines a fundamental implication of the "government budget constraint",* which is that at least one policy variable is determined endogenously and, therefore, can get out of control. Whatever the immediate or underlying causes, all four countries have felt compelled to pay more explicit attention to the financial imbalance of the public sector and to introduce restrictive measures despite high and growing rates of unemployment.

5. In this context, it is also useful to separate fundamental adjustment policies – those affecting real wages, profitability, productivity and competitiveness – from those of an adaptive, accommodating or defensive nature – such as exchange-market intervention and foreign borrowing, government assistance and subsidies to industry, and transfer payments to the unemployed. With the onset of the second oil shock, national authorities became much more attuned to the need to emphasise adjustment rather than adaptive policies.

6. A particular obstacle to adjustment by a small open economy is indexation especially of wages and budgetary expenditure,

* See Christ (1967) and Hansen (1973).

including welfare benefits. Austria has always specifically rejected indexation as inimical to a flexible incomes policy and even to harmonious wage/price negotiations, while Belgium (comprehensive wage and salary indexation), Sweden (indexation of pensions and certain other welfare benefits and periodic use of threshold schemes for wages) and Canada (taxes, transfers and in part also wages and salaries) have had to suspend indexation either wholly or partially during certain periods. Although it is possible to imagine benign versions, involving limits and conditionality, indexation has tended to be an enemy of adjustment.

7. This is particularly evident in periods of large external shocks such as terms-of-trade deteriorations and lower productivity growth. For a given change in money supply or nominal income the way in which such shocks are "split" between lower output growth and higher inflation depends importantly on the degree of wage flexibility, and in this respect Belgium and Austria represent two "opposite poles". In Belgium, as a consequence of the indexation scheme, the terms-of-trade deteriorations were fully reflected in higher nominal wages which, combined with a relatively low cyclical responsiveness of wages, meant a marked rise in the NAIRU; i.e. the maintenance of a stable inflation rate would have required an even steeper increase in unemployment than actually occurred. By contrast, in Austria wage-earners appear to have accepted the need for wage moderation in phases of external disturbance – and given, also, a high cyclical responsiveness of wages there has been very little change in either the actual unemployment rate or the NAIRU. While a similar cyclical responsiveness is also characteristic of Sweden, Canada is in an analogous position to Belgium owing to the absence of wage moderation in face of a marked decline in productivity growth.

8. As to the most recent developments and immediate prospects, the following features appear to be relevant:
– For the first time *Austria* has felt the problem of rising unemployment and is seriously concerned about the budget deficit. However, the external account has moved into surplus, so

the rise in the public-sector deficit may largely reflect higher net saving in the private sector, as the output share of fixed investment has fallen to only 23 per cent., compared with more than 28 per cent. in 1973. Another potential problem is that recent changes in nominal and real wages far exceed predictions based on past behavioural trends, even when certain constraints are imposed in estimating 1982 changes and the likely dampening effect of tax concessions is ignored. It should be noted that these predictions were based on extreme values for both the rate of unemployment and the rate of productivity growth and that a relatively well determined equation should not be discarded because of just one odd observation. Moreover, real wage increases have been well within the "norm" determined by productivity growth and terms-of-trade gains, and the share of wages in national income in fact declined by 2½ percentage points in 1982. Nonetheless, it cannot be ruled out that while the previous adjustment process in Austria has been relatively smooth, the problems immediately ahead may have to be assessed in a different light.

– *Canada* is in a very similar situation except that recent nominal and real wage changes are in line with historical trends. In general, the relatively small change in the external account during the 1970s combined with a favourable composition of commodity trade has very much reduced the adjustment requirement in Canada. The stable development in factor income shares has probably also been a beneficial factor, particularly with respect to investment. On the other hand, the fact that the major external disturbance was a slump in productivity growth, which so far has been met through a higher rate of price inflation, might imply a weakening of future competitiveness though most of the distortions observed in 1982 appear to have been cyclical. Finally, whether the recovery which is now starting will lead to a sustainable real growth path may depend crucially on the chosen future guide to monetary policy after the suspension of the M_1 target.

- *Belgium's* pursuit of a hard-currency policy from the early 1970s onwards was associated with cumulating distortions on both the real and the financial sides. This is not to say, however, that the policy was wrong in itself. Rather, the difficulty was the rigidity of wages and the growing structural budget deficit. Until these problems could be dealt with by vigorous measures, exchange rate devaluation or depreciation might only have made matters worse. In early 1982 the basis was laid for a major policy change with the introduction of emergency powers legislation. Thus, when the franc was devalued by 8½ per cent. in April, it was possible to accompany this with a comprehensive stabilisation programme including budgetary retrenchment, temporary price controls and a suspension of wage and salary indexation. In these circumstances the devaluation proved to be very successful, although the permanence of this sucess will depend on whether the modification of indexation can be maintained in suitable form.
- In recent years, thanks to deficit financing and two large devaluations, liquidity and profitability in the company sector in *Sweden* have increased dramatically. Real wages in the manufacturing sector have declined by some 13 per cent. in seven years, and present forecasts point to a further reduction this year. In particular, the devaluation of October 1982 seems to have worked out well. Thanks partly to a six-month price freeze, domestic prices remained relatively stable and the terms of trade did not deteriorate. However, with the price freeze now abolished, there is a danger that pressures might be building up. The main problem, apart from avoiding a new wage/price spiral, is to curb the creation of liquidity via public-sector deficits. The present high level of interest rates, of course, makes it much harder to reduce the budget deficit and the external current-account imbalance. Efforts at budget retrenchment include cutting back on budget subsidies to industry, scaling down the scope for offsetting interest payments against tax liabilities and increasing payroll and certain indirect taxes. Nonetheless, current estimates suggest that these efforts will primarily prevent the

deficit from growing, and it will take further efforts (or a sustainable economic recovery) to bring about a return to historical trends.

Annex
Wage rigidities and the "natural" rate of unemployment

The wage formation process has frequently been at the centre of discussions about how various countries have adjusted to the shocks experienced over the last decade, and in this context two aspects of wage behaviour have attracted particular attention: the degree of wage flexibility and the size and possible change in the "natural" rate of unemployment. However, there seems to be no generally agreed measure of wage flexibility, as some look at the sensitivity of nominal wages while others consider real wages. The variables in relation to which the wage response is measured also differ. In addition, the natural rate of unemployment as initially defined ("the unemployment rate ground out by a Walrasian equilibrium equation system", see Friedman (1968)) is only identifiable in a large macro-economic model. However, the natural rate is frequently replaced by the "non-accelerating inflation rate of unemployment" (NAIRU), which may be derived from a much smaller set of equations and under certain additional assumptions from wage and price equations alone. This substitution greatly facilitates the derivation of empirical measures, although it should be borne in mind that, owing to the smaller number of underlying equations and the more restrictive assumptions, the NAIRU does not constitute an equilibrium unemployment rate and will be affected by both nominal and real factors.*

Despite these limitations, one attraction of the NAIRU is that it may be linked to the degree of wage flexibility. For example, in

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* For further discussion of this point see Thirlwall (1983).

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conditions of adverse external shocks (here mainly defined as changes in productivity growth and in the terms of trade) and less than complete absorption of these shocks in nominal and real wages, the rate of inflation is bound to rise, and in order to prevent such a rise the rate of unemployment has to increase, with the size of the increase depending on the sensitivity of wage changes to the rate of unemployment. The required increase in the rate of unemployment will also depend on how quickly the rate of inflation is to be brought back to the initial rate, which in turn is a function of the lag structure in the wage and price determination process. However, since the NAIRU is essentially a long-run concept it is natural to combine the size of the external shocks with the long-run parameters of wage and price equations and in this way approximate changes in the NAIRU between selected time periods.

The purpose of this Annex is first to discuss the various measures of wage flexibility which have appeared in recent empirical works and then to develop a small model which has been applied in deriving the NAIRU measures discussed in the text.

A. Nominal and real wage flexibility

The various issues concerning the concept and measurement of wage flexibility may be illustrated by considering a simple model of wage determination:

$\dot{w}_t = a \, \dot{q}_t - b \, u_t + c \, \dot{p}_t^e$ where

$\dot{w}_t$ = rate of change in nominal wages

$\dot{q}_t$ = rate of change in productivity

u_t = rate of unemployment

$\dot{p}_t^e$ = expected rate of inflation

a, b and c = parameters, all assumed to be positive.

If $\dot{p}_t^e = \dot{p}_t$ (the actual rate of inflation) and $c = 1$, there is no difference between real and nominal wage flexibility with respect to productivity and the rate of unemployment, as they can both be measured by a and b, respectively. However, once $\dot{p}_t^e \neq \dot{p}_t$ and/or $c \neq 1$, real and nominal wage flexibility will differ. In addition, for

$c = 1$ and $\dot{p}_t^c = \sum_{i=1}^{n} \alpha_i \ \dot{p}_{t-i}$ with $\sum_{i=1}^{n} \alpha_i = 1$ nominal and real wage flexibility will only be identical in the long run, while in the short run they depend on the lag structure. This last point underlies a frequently made distinction between two main cases:

(a) the US or North American case, which is characterised by a long or drawn-out lag structure,* c close to or slightly below unity, b relatively small and a $\dot{q}_t$ replaced by a constant term. This combination of parameters tends to give a high degree of real wage flexibility in the short run, as fluctuations in price inflation will only affect nominal wages with a considerable time lag, and it gives the impression that adverse changes in the terms of trade and in productivity are "smoothly" absorbed in real wages. By contrast, nominal wages are rigid so that attempts to reduce the rate of inflation through restrictive policies are subject to long lags. The response of real wages to cyclical fluctuations is difficult to assess as it depends on the relative sensitivity of prices and nominal wages;

(b) the European case, which is characterised by a short lag structure, c close to or slightly above unity, b relatively large, and – as in the North American case – a $\dot{q}_t$ usually replaced by a constant term. With this parameter constellation real wages will be rigid with respect to changes in the terms of trade and in productivity growth. On the other hand, nominal wages are flexible with respect to u_t, implying that attempts to dampen inflation through restrictive policies will be relatively effective, unless other factors intervene. As in the North American case, the cyclical sensitivity of real wages is difficult to judge.

In recent literature, four models have been proposed for measuring and estimating wage flexibility, and the purpose of the following sub-section is to summarise these models and discuss their main features.

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* As is discussed in the text, the long lags observed for North America can also be explained by a strong impact of past wages relative to prices.

(i) Branson-Rotemberg (1980): This model is derived from the "real wage hypothesis"(proposed by Kuh (1967) for the United States and previously applied by Sargan (1964) to the United Kingdom) as the target level of nominal wages (W_t^*) is determined as:

$$\log W_t^* = \log P_t^e + a\,t - b\,\log u_t$$

implying that the targeted growth of real wages is assumed to follow a trend (a), with counter-cyclical fluctuations. The actual level of wages adjusts only partially to the target, and the adjustments may be in either nominal or real terms:

(a) $\log (W_t/W_{t-1}) = \lambda \log (W_t^*/W_{t-1})$ or

(b) $\log ((W_t/P_t^e)/(W_{t-1}/P_{t-1})) = \mu \log ((W_t^*/P_t^e)/(W_{t-1}/P_{t-1}))$

(a) and (b) may be combined into a general case:

(c) $\log (W_t/W_{t-1}) = \gamma_1 \log (W_t^*/W_{t-1}) + \gamma_2 \log (P_t^e/P_{t-1})$

with $\gamma_2 = 0$ implying nominal wage adjustment (case (a)) and $\gamma_2 = 1 - \gamma_1$ implying real wage adjustment (case (b)). Inserting the expression for W_t^* this general case may be rewritten as:

(d) $\log (W_t/W_{t-1}) = \gamma_1 a\,t - \gamma_1 b\,\log u_t + (\gamma_1 + \gamma_2) \log P_t^e - \gamma_1 \log W_{t-1} - \gamma_2 \log P_{t-1}$

Assuming that $\log (P_t^e/P_{t-1})$ can be approximated by $\dot{p}_t^e$ and $\log (W_t/W_{t-1})$ by $\dot{w}_t$ this expression reduces to:

(e) $\dot{w}_t = a't - b'\,\log u_t + c'\,\dot{p}_t^e - d'\,\log (W_{t-1}/P_{t-1})$

which is identical to an expectations-augmented Phillips curve except for the trend term and the lagged level of real wages. Once a measure for $\dot{p}_t^e$ has been constructed, equation (e) can be estimated and the parameters used to test whether the partial adjustment scheme applies to nominal or real wages.[*]

Equation (e) was tested in various forms, but except for Austria the coefficient with respect to lagged real wages was positive, while according to the underlying hypothesis it should be negative. These estimates are therefore not discussed in the text.

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[*] Branson and Rotemberg chose the wage equation in level form and on this basis they conclude that nominal wages are rigid in the United States while in major European countries real wages seem to be rigid.

(ii) Sachs (1979): The flexibility measure in this model is derived from a combination of nominal wage changes in new contracts being determined along the lines of an expectations-augmented Phillips curve and actual nominal wage changes adjusting only partially because of multi-year contracts. Denoting wage changes in new contracts by $\dot{w}^*_t$ and otherwise using the same notation as explained above, Sachs' model may be summarised as:

(f) $\dot{w}^*_t = -b\, u_t + \dot{p}^e_t + a$ and

(g) $\dot{w}_t - \dot{w}_{t-1} = \gamma\, (\dot{w}^*_t - \dot{w}_{t-1})$

where γ – apart from being a partial adjustment coefficient – measures the proportion of long-term contracts. Combining the two equations yields:

(h) $\dot{w}_t = \gamma\, a - \gamma b\, u_t + \gamma\, \dot{p}^e_t + (1 - \gamma)\, \dot{w}_{t-1}$

and it is estimated in both constrained and unconstrained forms. The coefficients with respect to $\dot{p}^e_t$ and $\dot{w}_{t-1}$ may be considered measures of wage flexibility, with $\gamma \simeq 1$ indicating real wage rigidity (with respect to autonomously induced changes in price inflation) and $\gamma \simeq 0$ pointing to rigid nominal wages. The estimating equation may also be expressed in "real" terms facilitating the distinction between the North American and European cases:

(h') $\dot{w}_t - \dot{p}^e_t = \gamma\, a - \gamma b\, u_t + (1 - \gamma)(\dot{w}_{t-1} - \dot{p}^e_t)$

If both γ and b are small, which is found for the United States, real wages (defined as nominal wages deflated by expected price increases) are mainly determined by inflation, and the autoregressive nature of nominal wages is reflected in real wages. On the other hand, for γ close to 1 and b relatively large (some European countries, Canada and Japan) both nominal and real wages have a high degree of cyclical sensitivity, while anticipated price changes do not affect the course of real wages.

(iii) Grubb et al. (1982): The wage equation used in this model is similar to that developed by Sachs (except that u_t is measured as a deviation from the "natural" rate (u^n_t), $\dot{p}^e_t$ is set equal to $\dot{p}_t$, a time trend is included and only constrained estimates are considered) and, in addition, they have a price equation:

(i) $\dot{p}_t = \theta\dot{w}_t + (1-\theta)\dot{w}_{t-1} - \bar{q}_t$

where $\bar{q}_t$ is the "feasible growth" of real wages, which, on the assumption of unchanged factor shares, equals productivity growth adjusted for changes in the terms of trade. From this it is seen that if $\bar{q}_t$ differs permanently from the real wage target (see equation (h)), and the authorities want to maintain inflation at a steady rate, u_t will have to increase. Moreover, the increase required to offset a one-point acceleration in $\dot{w}_t$ is $1/b$, and this is the real wage rigidity measure proposed by Grubb et al.

While $1/b$ is used in connection with unfavourable supply shocks the corresponding measure of nominal wage rigidity is related to the process of reducing inflation through restrictive policies. Assuming that both wage and price equations satisfy a homogeneity constraint, the long-run or permanent rate of inflation is independent of the rate of unemployment. It is therefore possible to lower the rate of inflation permanently by holding u_t above u_t^n during a certain period, with the length of the period and the accumulation of slack depending on the time lags in both the wage and the price equations. Thus, to reduce $\dot{w}_t$ by one point requires a rise in u_t of $(1-\theta\gamma)/\gamma b$ and this is proposed as a measure of nominal wage rigidity. As noted by Grubb et al. this measure is interesting in two respects: first, real wage rigidity will, ceteris paribus, also imply nominal wage rigidity; and secondly, the component $(1-\theta\gamma)/\gamma$ is the combined average lag in the wage and price equations, implying that an autoregressive inflationary process tends to create nominal wage rigidity in the sense that unemployment will have to be held at a higher level for more years than if wage and price changes were subject to only short lags.[1] To this might be added a third aspect, which is that lags in the wage as well as the price equation enter the proposed measure, so that what is commonly referred to as nominal wage rigidity might in fact be due to long lags in the adjustment of prices.[2]

[1] $1/b$ may be considered as the one-year rise in the rate of unemployment required to reduce the annual rate of wage increases by one point assuming that there are no lags. The second term can then be interpreted as the number of years for which it is necessary to hold the unemployment rate at the higher level.

[2] This is the case for the estimates Grubb et al. derive for Belgium, and a similar result is found below.

(iv) OECD (1983b): In a recent study the OECD has proposed measuring real wage flexibility as the difference between the elasticities of nominal wages with respect to consumer prices and the rate of unemployment (with the latter defined as positive). This measure is not derived from any rigorous theoretical model nor does it attempt to answer specific questions such as the measure proposed by Grubb et al. It has the advantage, however, that it is not confined to wage equations which imply a long-run vertical Phillips curve.[1] Moreover, it provides an appealing combination of the two most important parameters of the wage equation.

B. *Determination of the NAIRU*

When the wage and price equations satisfy homogeneity conditions (i.e. the coefficients on the nominal variables add up to unity) the NAIRU can be calculated from the real wage rigidity and the remaining variables and parameters of a reduced-form wage equation. The relationships we have used in estimating the relevant parameters closely resemble those proposed by Sachs and Grubb et al. Thus the rate of change in nominal wages was specified as a function of the rate of unemployment, expected inflation and the lagged change in wages. Moreover, in order to measure the extent to which external shocks are "absorbed" in wages, productivity changes and the terms-of-trade were also included, with the former measured as the annual change in either current or lagged output per hour and the latter as the ratio between indices of export and import prices.[2] Price expectations were determined from a one-period autoregressive scheme and actual price changes were assumed to depend on changes in unit labour costs, lagged price changes and (with a coefficient corresponding to the share of foreign trade) the terms of trade as measured above. Including intercept terms,

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[1] For the same reasons, this measure does not permit calculations of NAIRUs or changes in the NAIRUs.

[2] Expressed in percentages and as deviations from 100.

imposing homogeneity conditions, and denoting the terms of trade by TOT, this three-equation model may be set out as follows:[1]

(i) $\quad \dot{w}_t = \gamma\, a - \gamma b\, u_{t-i} + \gamma\, \dot{p}_t^e + (1-\gamma)\, \dot{w}_{t-1} + \gamma c\, \dot{q}_{t-i} + \gamma d\, TOT_{t-i}$

(ii) $\quad \dot{p}_t^e = e + f\, \dot{p}_{t-1}$

(iii) $\quad \dot{p}_t = \theta k + \theta\, (\dot{w} - \dot{q})_t + (1-\theta)\dot{p}_{t-1} + \theta\, m\, TOT_{t-i}$

From this the long-run wage and price equations may be written as:

(iv) $\dot{w} = a - b\, u + \dot{p} + c\, \dot{q} - d\, TOT$ and

(v) $\dot{p} = k + \dot{w} - \dot{q} + m\, TOT$

which by substitution yield:[2]

(vi) $0 = a + k + (c - 1)\, \dot{q} + (m - d)\, TOT - b\, u$

and a NAIRU determined by:

(vii) $NAIRU = (1/b)\, (a + k + (c - 1)\, \dot{q} + (m - d)\, TOT)$.

1/b is the real wage rigidity which measures the change in the rate of unemployment required to reduce the long-run rate of inflation by one point.[3] The second component in (vii) may be interpreted as the potential change in the rate of inflation due to movements in productivity and the terms of trade and it can be further disaggregated into two elements, the first of which consists of $\dot{q}$ and TOT (or their change between selected periods) while the second rests on the assumption of constant factor shares and measures the extent to which such changes are not absorbed in wages. Thus from (vii) it immediately appears that:

$dNAIRU/d\dot{q} = (c - 1)$ and

$dNAIRU/dTOT = (m - d)$

implying that deteriorations in the rate of productivity growth will increase the NAIRU if productivity changes are not fully reflected in nominal wages, while adverse shifts in the terms of trade will raise

[1] As discussed in the text, dummy variables were also included for Sweden and Canada but are not shown below.

[2] The left-hand side reduces to 0 as the rate of inflation is undetermined owing to the homogeneity restrictions.

[3] Given the nature of the NAIRU concept, nominal wage rigidity plays no rôle in these estimates. If, however, changes in $\dot{q}$ and TOT are only temporary, one might ask how long the rate of unemployment should be kept above or below the earlier level in order to prevent changes in the rate of inflation, and for this calculation nominal wage rigidity with its explicit recognition of lags would be relevant.

the NAIRU when the wage response to such changes (in absolute terms) is smaller than the foreign trade share.

The NAIRU estimates for the periods 1965–73 and 1974–81 are presented in the text, and the parameters and average values used in these calculations are given in Table 1. The parameters of the wage equations were all taken from the constrained estimates for nominal wages discussed in the text, while the coefficients relating to the price equations are given in Tables 2 and 3 with $\dot{p}_t$ as dependent variable.[1]

It may also be of interest to show the associated measures of real and nominal wage rigidity and the average lags and compare these with those estimated by Grubb et al. (given in brackets). This is done in Table 4, from which it is seen that Austria and Sweden have the most flexible wage behaviour, while in Belgium and Canada nominal wages are particularly rigid. In both countries, however, the long lags derive mainly from the price equation, though in the case of Canada nominal wages are also subject to long lags. Given differences with respect to specification and period of observation, the estimates are quite close. Major deviations are confined to the average lags (and their implications for nominal wage rigidity) in the case of Belgium and Canada, and in the case of Canada an average lag of 1.3 would seem to be more realistic than the figure shown in Table 4.[2]

In conclusion, several reservations concerning the concepts and measures presented above should be noted. Firstly, and most

[1] With respect to statistical and dynamic properties of the estimated wage equations p^e, as defined here, is identical to using lagged price changes. Table 2 is included mainly to give some impression of the extent to which wage-earners will "miss" current price trends if they base their expectations on changes of the previous year.

[2] Several different specifications were tested, and it might be noted that the estimates given in Table 4 satisfy the homogeneity conditions even though no constraints were imposed. Generally, it would have been more satisfactory to estimate separate equations for exposed and sheltered sectors, assuming that a clear distinction can be made. In the case of Sweden, Calmfors (1978) finds that prices in the sheltered sectors are dominated by changes in unit labour costs and lagged prices, whereas prices in the exposed sector follow world prices.

Table 1
Parameters and average values

Countries	a	−b	γ	c	d	k	m[1]	θ	q[2]		TOT[2]	
									1965–73	1974–81	1965–73	1974–81
Austria .	11.7	−5.3	0.67	0.6	0.8	0.7	0.32	0.21	6.0	3.5	2.6	0.6
Belgium .	8.7	−1.2	0.96	0.4	−0.2	2.5	0.54	0.32	7.7	6.5	2.5	1.6
Canada .	17.6	−1.6	0.35	0.3	0.6	–	0.23	0.18	4.5	1.9	−10.5	2.2
Sweden .	9.8	−2.3	1.35	–	0.3	2.5	0.26	0.32	6.5	2.9	− 4.0	6.9

[1] Estimated as the average share of exports and imports in GNP for 1973.
[2] Average values may not correspond to the periods shown, as lags in the wage equations are taken into account.

Table 2
Inflationary expectations

Countries	Constant	$\dot{p}_{t-1}$	R^2	DW
Austria	1.48 (1.4)	0.74 (4.0)	0.50	1.3
Belgium	1.66 (1.4)	0.76 (4.4)	0.55	1.2
Canada	1.22 (1.2)	0.91 (6.5)	0.74	1.3
Sweden	2.46 (1.5)	0.73 (3.7)	0.45	2.1

Table 3
Price equations

Countries	Constant	$\dot{w}-\dot{q}$	$\dot{p}_{-1}$	TOT	R^2	DW
Austria	2.03 (2.0)	0.21 (2.1)	0.44 (2.0)	–	0.59	1.7
Belgium	0.80 (2.4)	0.32 (5.3)	0.68*	0.54*	0.65	1.6
Canada	–	0.18 (1.1)	0.83 (4.2)	0.09 (1.4)	0.74	1.3
Sweden	2.55 (2.0)	0.32 (2.4)	0.44 (2.4)	–	0.64	2.1

* Coefficient imposed a priori.

Table 4
Real and nominal wage rigidities

Countries	Real wage rigidity	Nominal wage rigidity	Average lags		
			Wages	Prices	Total
Austria	0.20 (0.4)	0.2 (0.2)	0.50 + 0.5	=	1.00 (0.5)
Belgium	0.80 (0.7)	1.7 (1.1)	0.04 + 2.1	=	2.15 (1.6)
Canada	0.60 (0.6)	3.8 (0.8)	1.85 + 4.5	=	6.35 (1.3)
Sweden	0.45 (0.4)	0.3 (0.2)	−0.26 + 0.9	=	0.65 (0.6)

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importantly, the NAIRU concept and the associated flexibility measures are based on the assumption of a long-run vertical Phillips curve, and this assumption is imposed rather than tested in a rigorous way. In several cases, and particularly with respect to the price equations, the estimates are not very satisfactory when the homogeneity conditions are imposed. suggesting that the wage and price formation process contains more flexibility than implied by the vertical Phillips curve and that it might be advisable to rely on a more "pragmatic" concept, such as the one proposed by the OECD. Secondly, some of the parameters appear to be unstable und vary over a wide range depending on specification and the assumed lag structure. This is especially true of the unemployment coefficient, which is crucial for the calculation of the NAIRU.* Thirdly, except in the case of Belgium and partly also Canada, terms-of-trade shifts do not seem to influence the rate of price change once lagged prices are included. While this result may be due to special factors preventing firms from passing on cost increases during the period of observation, it imparts an additional uncertainty to the calculations, even though the implied wider scope for nominal wage changes has been allowed for. Fourthly, it should be recalled that the estimated changes in the NAIRU only take account of shifts in productivity growth and in the terms of trade and do not include possible structural developments in the labour market due, for instance, to changes in unemployment benefits, minimum wages, demographic factors and the distribution of employment between sectors.

All in all, therefore, the results concerning the NAIRUs for the four countries considered should be interpreted cautiously and mainly as tentative indicators of inflationary pressures due to external shocks and incomplete wage and price moderation.

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* The coefficient with respect to the rate of unemployment would be considerably higher in the case of Canada if the dummy variable were not included, but it would drop to only 0.25 if the lagged instead of the current unemployment rate were used.

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