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LABOUR MARKET CHARACTERISTICS,  
STABILIZATION POLICY AND  
REAL WAGE FLEXIBILITY

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## ABSTRACT

Real wage flexibility may be an important characteristic of an economy's labour market, contributing to an increase in output and employment in the case of an expansionary macroeconomic policy and mitigating the stagflationary outcome of a supply shock.

In this paper we estimate the degree of real wage rigidity (the counterpart of real wage flexibility) for a sample of 8 large and 8 smaller industrial countries. We follow the approach that was introduced by D. COE (1985).

It is found that real wage rigidity differs very much between countries. Yet, the degree of real wage rigidity does not seem to be significantly higher in the group of small countries as compared to the group of large countries, as is sometimes suggested (cf. e.g. L. CALMFORS, 1984). Indeed, if anything the contrary is the case. Anyway, real wage flexibility in the United States and Japan compares favourably with the European countries in general.

Taking the importance of real wage flexibility for granted, we then focus our attention to its determinants. Two different hypotheses are put forward and tested empirically.

First, we relate the degree of real wage rigidity to several structural features of the labour market, viz. the degree of corporatism (as defined in the paper) and the degree of nominal wage responsiveness. For the latter, several composite parts (like the degree of wage indexation, the average duration of wage agreements in the economy, and the degree of synchronization between the outcomes of sectoral wage negotiations) are also introduced in a separate way.

Second, we associate the degree of real wage rigidity with

government accomodating policy in general (fiscal policy stance), and with its public employment policy in particular.

The hypothesis that differences between countries in the degree of real wage rigidity can be explained by differences in their fiscal policy stance or in government employment is not comfirmed by the empirical evidence. With respect to the structural features of the labour market, one hypothesis, viz. that differences in real wage rigidity are determined by differences in the degree of indexation between countries, is not contradicted by the data.

## 1. Introduction

Several economists have stressed the need for real wage restraint in the face of permanent supply shocks such as those of the 1970s (two oil price shocks, general decline in labour productivity, etc.). They have argued that slower real wage growth is a prerequisite for a return to macroeconomic stability (see e.g. M. BRUNO & J. SACHS (1985), D. COE (1985), J. SACHS (1983), L. CALMFORS (1984), P. VAN ROMPUY (1985), F. KLAU & A. MITTELSTADT (1986)) (1).

The argument for real wage adjustment will not be repeated in this paper. Neither will we investigate whether countries that were successful in adjusting the course of real wages to the new

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1. An 'early' statement in this direction is in the McCracken report. See McCracken (1977, p.221-3).

conditions ended up with significantly better macroeconomic results, particularly in terms of the standard objectives of full employment and price stability.

Taking the importance of real wage adjustment for granted, we will pay attention to the determinants of real wages and to the differences between countries in real wage flexibility (or its counterpart real wage rigidity) and adjustment.

The paper is organised as follows. Section 2 presents data on the evolution of real wages in the 70s and first half of the 80s for 8 large industrial countries and 8 smaller European countries. They constitute the country sample that will be dealt with throughout this paper. In section 3 a standard model of the labour market is presented, from which we derive a basic wage equation. Regression results obtained from an estimation of this equation, and indicators of real wage rigidity that can be derived from them are shown in section 4.

One of the stylized facts with respect to real wage evolution is the break that occurred somewhere in the second half of the 1970s (and perhaps also at the beginning of the 80s). It remains a question, however, whether this reflects a change in the basic relationship or whether the observed decline in real wage growth is simply the outcome of the new labour market situation (increased unemployment in particular). Section 5 of the paper tries to answer this question by looking for shifts in the estimated equation. Sections 6 and 7 then pay attention to the determinants of differences between countries in real wage flexibility. In particular, we investigate the importance of labour market characteristics and government behaviour for the observed differences in real wage flexibility. The overall findings of the paper are summarized in section 8.

2. REAL WAGE EVOLUTION IN THE 1970s AND THE FIRST HALF OF  
THE 1980s

Table 1 presents data for average real wage increases since 1970 for 8 large industrial countries (Australia, Canada, France, Germany, Italy, Japan, the United Kingdom and the United States) and 8 smaller European countries (Austria, Belgium, Denmark, Ireland, the Netherlands, Norway, Sweden and Switzerland). Real wages are defined as consumer real wages, i.e. nominal wages deflated by the consumer price index. Ideally, one would like to make a distinction between consumer real wages and producer or product real wages, the latter being defined as nominal wages deflated by the index of value added. As for nominal wages, these are defined as hourly or weekly rates or earnings and mostly do not include non-wage labour costs such as employers' social security contributions (2). Table 1 is organised such that a comparison between large and small countries is facilitated.

TABLE 1

One of the striking facts illustrated in this table is the significant and general decline in real wage growth during the second half of the 1970s. On average, real wages in the second period rose by merely one fifth of the figure noted for the first period. An important exception is the United States where real

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2. A complete description of the data and their source is given in the appendix.

wages on average hardly increased over the period 1970-84 and where no evidence for the existence of subperiods can be found.

It is clear that the course of real wages changed dramatically after the first oil price shock and the resulting recession. The actual year that marks the beginning of a 'new' period differs somewhat between countries. To be clear, the years indicated in the table are chosen on casual observation and may be subject to discussion. Yet, they mostly point to a significant change in wage behaviour at the beginning of the second half of the 1970s. Indeed, for about half of the countries, 1976 is the relevant year although in countries like the United Kingdom and Switzerland the decline started earlier. In France, on the other hand, it took until 1980 to bring about a significant decline in real wage growth (even then real wages rose again by 7.6% in 1982!).

Two observations remain to be made with respect to table 1. First, one is not left with the impression that the real wage decline in large industrial countries was more pronounced than in the smaller European countries. If anything, it is rather the opposite. Not only was the average real wage increase in the group of small countries significantly lower than for the sample of large countries. But there were also fewer divergencies from the average. Second, contrary to Calmfors' assertion (L. CALMFORS, 1980, p. 90) we see no evidence that the real wage decline in the larger industrial countries started earlier than in the small European countries (Even if France is excluded there is no evidence of an earlier response in the larger countries).

### 3. A STANDARD MODEL OF THE LABOUR MARKET

In our search for an explanation of real wage changes we start from a simple model of the labour market (see e.g. R. GORDON

(1984)).

Figure 1 shows demand and supply for labour in terms of the nominal wage rate. The downward-sloping demand curve for labour ( $N_d$ ) corresponds to the marginal revenue of labour (to put it simply, the marginal product of labour times the output price). If required, autonomous government demand for labour (not based on marginal revenue) can be added to private demand. The economy's labour supply curve ( $N_s$ ) slopes upward, reflecting the standard assumption that the substitution effect of a wage increase dominates the income effect.

Note that the labour demand curve is drawn for one price level, and that the labour supply curve is drawn for one expected level of prices. The distinction between the actual price level (the relevant variable for the producers) and the expected price level (the relevant variable for the wage earners) reflects the hypothesis that producers are fully aware of price changes and can easily adapt their prices to changes in output market conditions, whereas wage earners have to form their price expectations for a longer period ahead as they are bound by long-term contracts and other rigidities.

#### FIGURE 1

Originally, there is labour market equilibrium in point a where the actual price level equals the expected price level. Our purpose is to analyse the effect on real wages of shifts in the demand and/or supply curve. A general price increase will lead to an upward shift of the labour demand curve. Nominal wages



will increase as firms need to offer higher wages to attract additional labour (point b). The effect on real wages, however, is negative. Indeed, prices have risen up by the vertical distance between  $N_{d1}$  and  $N_{d2}$  whereas money wages have increased by less, viz. from  $W_1$  to  $W_2$  (nominal wages do not increase as much as output prices, since the new balance is partly due to an increase in employment also).

An increase in the expected price level, on the other hand, leads to an upward shift in the labour supply curve. If, in the previous example, the expected price level fully adjusts to the actual new price level the  $N_s$ -curve will shift from  $N_{s1}$  to  $N_{s2}$  so that the net effect on employment disappears. The upward shift in the  $N_s$ -curve leads to a further increase in the nominal wage rate. If the expected price level rises together with the actual price level, real wages will in the final outcome not be altered, since in that case nominal wage rates fully adjust to the increased price level. If, on the other hand, the expected price level lags behind the actual price level, an increase in the price level will result in a decrease of the real wage rate.

Figure 1 can also be used to analyse the effect of a change in labour productivity. An increase in labour productivity leads to an upward shift in the labour demand curve and hence to an increase in nominal and real wages.

The effect of unemployment on real wages is illustrated in figure 2. Unemployment being defined as an excess of labour supply over labour demand, it can only be the result of a wage rate that is not in equilibrium. Thus all unemployment is considered here as classical unemployment. Figure 2 shows that there is a negative effect of unemployment on nominal (and real) wages as the wage rate will eventually adjust so as to restore equilibrium in the labour market.

## FIGURE 2

4. ESTIMATION RESULTS FOR THE BASIC EQUATION

The model of the labour market that underlies figures 1 and 2 is static in the sense that price and wage levels are used. As a result, it is suitable for analysing only a single change in the wage level, and not a process of continuously rising wages. Yet, the static-case insights can be generalised without altering much to the conclusions. Instead of levels growth rates then become the relevant variables : nominal wage inflation, price inflation and expected price inflation.

Equation (1) is assumed to capture the determinants behind nominal wage inflation :

$$(1) \quad w = a + b p + c u + d q + e w_{-1}$$

$$\text{with :} \quad 0 < E(b) < 1; \quad E(c) < 0;$$

$$E(d) > 0; \quad 0 < E(e) < 1$$

and with  $w$  : nominal wage growth,  $p$  : growth rate of consumer prices,  $u$  : unemployment rate,  $q$  : growth rate of labour productivity.

Two remarks should be made with respect to equation (1). First, assuming partial adjustment of nominal wages, lagged wage inflation has been added to the list of explanatory variables. Second, the expected price inflation rate is left out of the equation. Instead the coefficient of the actual price inflation rate is expected to capture both the direct effect on nominal wages of increased demand for labour as well as the indirect (second round) effect on nominal wages of decreased supply of labour due to increased inflationary expectations.

The results obtained from an estimation of this equation for the period 1961-1984 <sup>(3)</sup> are shown in table 2. Note that the equation was reestimated leaving out variables with regression coefficients that were not statistically different from zero. The results for the regression including all variables are shown in the appendix.

#### TABLE 2

The estimation results are generally quite good in terms of the standard statistical measures, except for the Scandinavian countries for which low coefficients of determination and F-values are obtained.

In all cases the price inflation variable turns out to be a highly significant variable in explaining nominal wages. The same goes for the unemployment rate, which only in the case of the United Kingdom does not contribute to explaining the growth rate of nominal wages. Note further that the unemployment rate

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<sup>3</sup>. The exact estimation period for each country is also shown in table 2.

has the expected negative sign.

Price inflation and unemployment go a long way towards explaining nominal wages. Only in a few cases does labour productivity significantly affect wages too. Indeed, this effect could only be detected for the United States, Austria and the Netherlands.

The partial adjustment mechanism that we assumed to be at work only seems to hold for 4 out of the 16 countries in the sample (Canada, Japan, the United States, and Norway). For most countries the adjustment of nominal wages is completed within a year.

In table 3 the results are reproduced such that a comparison of real wage responsiveness and rigidity between large and smaller countries becomes easier. Besides the estimated coefficients, two indicators of real wage rigidity are shown, viz. :

$$R1 = b / |c| \quad \text{and} \quad R2 = (b - d) / |c|$$

The indicator R1, introduced by D.COE (1985), is obtained by dividing the estimated coefficient of the price inflation variable by the absolute value of the estimated coefficient of the unemployment rate variable. The lower (higher) the coefficient the less (more) real wage rigidity. The coefficient R2 is added in order to take into account the fact that in some countries nominal wages apparently respond to changes in labour productivity, whereas in others they do not. However, from the point of view of economic policy, R1 is the more relevant indicator. Indeed, the inflation rate and the unemployment rate can both be manipulated by economic policy in order to obtain a real wage decline, whereas labour productivity is the outcome of a complex process that can only be marginally influenced by economic policy.

TABLE 3

Table 3 shows that real wage rigidity can vary substantially between countries. Rigidity seems to be particularly high in France for example, due to a combination of high price inflation responsiveness of nominal wages and low unemployment responsiveness. Japan is at the other extreme. Its favourable result is the outcome of both low price inflation responsiveness as well as high unemployment responsiveness.

As far as the difference between large and small countries is concerned, there is no evidence of a weaker performance of the latter. On the contrary, both the average value and the standard deviation for the R1 and the R2 indicator are smaller for the sample of small countries.

One of the underlying forces behind real wage flexibility is the responsiveness of nominal wages to increased price inflation. The coefficient on the price inflation variable indicates to what extent an inflationary policy can contribute to lower real wage inflation. The estimation results for the b coefficient are repeated in table 4, which also shows the t-values for the hypothesis that b equals one. For countries with a partial adjustment mechanism a distinction is made between the value of the b coefficient in the short term and in the long term.

TABLE 4

As could be expected, an inflationary policy proves to be unsuccessful for most countries. This observation is also in line with the theoretical insights. Notable exceptions are Germany, Japan and Switzerland who seem to be capable of lowering their real wage increase on a permanent basis by means of an expansionary policy, which leads to an increased (but stable) inflation. The United States and Canada are examples of economies where such a policy can only lead to short term success. In these countries real wage increase can only be lowered permanently through a policy of accelerating inflation.

A restrictive demand policy raising unemployment, on the other hand, seems to be successful in reducing the growth rate of real wages in all countries, except in the United Kingdom. Table 5 shows the estimated values of the short-term and long-term unemployment coefficient. The countries are classified according to their long-term unemployment coefficient.

#### TABLE 5

However, there are remarkable differences between countries. Japan, in particular, has a very favourable relationship between real wage growth and unemployment. On the other hand, the welfare costs in terms of unemployment and lost output of a real wage reduction seem to be quite high for France, the Netherlands, Ireland, (Denmark) and Australia.

Here also, there is no evidence of a difference between large and small countries as a group.

## 5. LOOKING FOR SHIFTS IN THE BASIC RELATIONSHIP

Casual observation shows that the course of real wages changed significantly during the second half of the 1970s (with the exception of a few countries for which we noted an earlier or later year, as shown in table 1). The question still remains, whether this change in real wage performance reflects a different behaviour of wage earners or their representatives or whether this observed decline in real wage growth is no more than the outcome of the changed labour market conditions (increased unemployment in particular).

In order to answer this question, we reestimated equation (1), after introducing a dummy for the second period. Three alternative ways were tried, viz.

$$(2a) \quad w = a + b p + (c_0 + c_1 \cdot D)u + d q + e w_{-1}$$

$$(2b) \quad w = a + (b_0 + b_1 \cdot D)p + c u + d q + e w_{-1}$$

$$(2c) \quad w = a + D + b p + c u + d q + e w_{-1}$$

The dummy variable (D) takes the value of zero in the first period and the value of 1 in the second period. For each country the second period starts with the year that is indicated in table 1.

We are particularly interested in the results of equation 2(a),

since it would eventually reflect changes in the responsiveness of wages to labour market conditions. The results that were obtained from an estimation of this equation are shown in table 6. The results for equation (2b) and (2c) are shown in the appendix.

TABLE 6

Table 6 only contains the results for those countries for which the  $c_1$  coefficient proved to be significantly different from zero. This is the case for 8 out of the 16 countries.

Yet, comparing table 2 and table 6 it is obvious that the estimation results are only significantly improved for Denmark and to a lesser extent for Sweden. We recalculated the R1 and R2 values for the 8 countries at issue, based on the results in table 6. They do not differ much from those reported in table 3, and where they do differ the results point to a worsening instead of an improvement of real wage rigidity.

The above observations lead us to conclude that there is no strong case to be made for a significant shift in the relationship between nominal wages, price inflation, unemployment and possibly labour productivity during the last decade. This conclusion is reaffirmed by the results for equation (2b) and (2c) that are shown in the appendix.

#### 6. LABOUR MARKET CHARACTERISTICS AND DIFFERENCES BETWEEN COUNTRIES IN REAL WAGE FLEXIBILITY

As was shown in table 3, real wage rigidity varies to a great extent between different countries. The average value of R1 for



the whole sample of countries (excluding the United Kingdom) actually is 1.26, whereas the coefficient of variation is 0.83. For the indicator R2 the corresponding values are 1.05 and 1.06.

In this section and the next we search for an explanation for these differences in the estimated values of R1 and R2. Two hypotheses will be put forward : (a) differences in real wage rigidity reflect differences in structural characteristics of the labour market between countries; (b) differences in real wage rigidity reflect differences in government behaviour towards the unemployment that results from it.

The first hypothesis is obvious. The problem with this hypothesis, however, is to select the relevant labour market characteristics and to measure them in a satisfactory way. In this paper we focus on two aspects of the working of the labour market : (1) the degree of corporatism; (2) the degree of nominal wage responsiveness. Both labour market characteristics are suggested by M. BRUNO & J. SACHS (1985, p. 217-247) as being highly relevant for the relative ease with which different countries were able to achieve (real) wage moderation in the 1970s.

In this context, corporatism is defined as "institutionalized negotiation, bargaining, collaboration, and accord about wages and 'incomes policies' (and perhaps additional economic issues) between representatives of the major economic groupings in the society (most typically labor confederations and employers' associations) and often including, in addition, representatives of the government" (M. BRUNO & J. SACHS, 1985, p. 222). The overall degree of corporatism is the outcome of different structural characteristics : whether wage negotiations proceed on the national level, on the plant level or in between; the power of national labour organizations over their constituent members; the degree of organization on the employer side; the power of plant-level union stewards (the more power they have, the less

corporatism there is).

It follows from this enumeration that we would expect a negative relationship between the indicator of real wage rigidity (R1 or R2) and the degree of corporatism.

The degree of nominal wage responsiveness, on the other hand, refers to the institutional bargaining features which help to determine how rapidly unexpected price changes can feed through into nominal wages. The average length of wage agreements (duration of agreement), the degree of explicit wage indexation, and the extent to which wage setting is highly synchronized between sectors are the component parts of the overall degree of nominal wage responsiveness.

Since nominal wage responsiveness will find expression in a high value for the b coefficient in the nominal wage equations, we would expect a positive relationship between the indicator of real wage rigidity and the degree of nominal wage responsiveness.

The explanatory power of the different labour market characteristics mentioned above, was tested by means of two-variable linear regression with R1 or R2 as the dependent variable. Data for the independent variables were taken from M. BRUNO & J. SACHS (see appendix). The results for these estimations with R1 as dependent variable are shown in the upper part of table 7 (the difference between the results for R1 and R2 are minor).

Neither corporatism nor nominal wage responsiveness (as a whole) are able to explain the differences in real wage rigidity between countries in a satisfactory way. To be sure, the corporatism index (CI) has the expected negative sign (the higher the degree of corporatism as defined above, the lower real wage rigidity), but variations in CI only explain 14 % of the variations in R1. As an overall measure the degree of nominal wage responsiveness

is not able to explain differences in  $R_1$  either. Yet, the degree of indexation index (DII), which is a composite part of nominal wage responsiveness, goes a long way towards explaining differences in  $R_1$ . The coefficient of DDI has the expected positive sign and is significantly different from zero. It appears that 44 % of the differences in  $R_1$  can be contributed to differences in DDI.

#### 7. GOVERNMENT STABILIZATION POLICY AND DIFFERENCES BETWEEN COUNTRIES IN REAL WAGE FLEXIBILITY

It has been suggested by e.g. L. CALMFORS (1984) that high real wages may be the outcome of a game between the government (stabilization policy) and wage-earner organizations.

The main idea is illustrated in figure 3. There it is assumed for simplicity's sake that only one trade union organizes all labour and that this trade union unilaterally determines the wage rate. Employers are assumed to accept this wage rate and to make individual output and employment decisions on the basis of it. The goals of the trade union (high real wage, high level of employment) are shown by a series of indifference curves combining different values of the real wage rate and the level of employment that it regards as giving the same welfare. The downward-sloping straight line named I, on the other hand, shows the relation between the demand for labour and the real wage. It acts as a constraint on the union decision. The trade union will choose a combination of real wage and employment that gives the highest welfare. This is in point a in figure 3, with employment  $N_0$  and real wage  $w_0$ .

## FIGURE 3

In figure 3 point b refers to a higher real wage rate ( $w_1$ ) and to a lower level of employment ( $N_1$ ) than point a. Normally, the trade union would not choose this combination of real wage and employment, since it represents a lower level of welfare (b lies on a lower indifference curve). Yet, one might think of point b as a temporary situation, e.g. if the union has overestimated the price inflation rate. Eventually the economy would return to point a.

Things are different, however, if the union expects government to increase employment in the private sector through expansive fiscal policies, or to increase employment directly in the public sector, in the event of excessive real wages. Take the example of public employment. If the trade union expects employment to fall only to  $N_3$  instead of  $N_1$  ( $N_3 - N_1$  extra workers being employed in the government sector), the labour-demand schedule becomes less elastic (line II). Taking these expected policy reactions into account the union will change its behaviour. In figure 3, the point of highest welfare now becomes point c, with wage rate  $w_2$  and employment level  $N_2$ .

It follows from figure 3 that we would expect the highest degree of real wage rigidity in those countries where government has pursued the most active employment policies, either directly through government employment, or indirectly through general fiscal stimuli.

In order to test this hypothesis we regressed the indicators of real wage rigidity on several measures of government employment policy, viz. (a) the general government budget balance; (b) the structural budget balance; (c) the structural budget balance net of interest payments (in each case as a percentage of potential

GDP or GNP); and (d) the government share in employment. Both average levels (1970-84 for budget balances; 1970-80 for government employment) as well as absolute changes (1980-84 versus 1970-74 for budget balances; 1980 versus 1970 for government employment) were tried.

The results of these regressions are shown in the lower part of table 7. It is obvious that they do not support the hypothesis that was put forward. There is indeed no correlation between the indicator of real wage rigidity and any of the alternative measures of the stance of government stabilization policy.

## 8. CONCLUSIONS

In this paper we try to explain the evolution of real wages in the 1970s and the first half of the 1980s for 8 large and 8 smaller industrial countries. From the basic equations that are estimated, indicators of real wage rigidity are derived.

Common to all the countries that we investigate (except for the United States) is the significant decline in real wage growth starting from the second half of the 1970s. However, we show that the real wage decline in the large industrial countries is not more pronounced than in the smaller European countries. Neither does the decline start earlier in the first group of countries.

We also show that the decline in real wage growth mentioned above is not due to a changed relationship between nominal wage inflation and its determinants (viz. price inflation, unemployment and for some countries also labour productivity), but that it merely reflects the new labour market situation of the last decade (increased unemployment in particular).

Real wage rigidity varies substantially between countries. This variability is due to differences in the composite parts of the index of real wage rigidity : the price inflation responsiveness of nominal wages, the unemployment responsiveness of nominal wages (and possibly also the labour productivity responsiveness). As far as the difference between large and smaller industrial countries is concerned, there is no evidence of a systematic weaker performance of the latter.

With respect to the determinants of differences between countries in real wage rigidity we investigate the importance of labour market characteristics specific to a particular country and government stabilization policy (employment policy in particular).

Labour market conditions are proxied by the degree of corporatism and by the degree of nominal wage responsiveness. We show that neither of these are able to explain the differences between countries in real wage rigidity in a satisfactory way. However, the degree of indexation (a composite part of the degree of nominal wage responsiveness) goes a long way towards explaining differences in real wage rigidity between countries.

The stance of government stabilization policy is proxied by several measures of the government budget balance and by the share of government employment in total employment in the economy. Average levels as well as absolute changes are used. However, the results do not support the hypothesis that differences in real wage rigidity are due to differences in government behaviour between countries.

APPENDIX : SOURCE OF DATA

Nominal wages : I.M.F., Yearbook of International Financial Statistics, 1985, line 65 (or 65ey, 65c, 65b).

Consumer prices : idem (line 64).

Unemployment rate : Commission of the European Communities, European Economy, November 1985 (table 3 : unemployment rate as a percentage of civilian labour force). Supplemented with O.E.C.D., Main Economic Indicators, 1964-83 Historical Statistics, 1984, and O.E.C.D., Main Economic Indicators, July 1986.

Productivity : Computed by subtracting the growth rate of employment from the growth rate of GNP or GDP at constant prices.

Employment : Commission of the European Communities, European Economy, November 1985 (table 2 : Employment; total economy). Supplemented with I.L.O., Year Book of Labour Statistics, several issues.

GNP at constant prices : I.M.F., Yearbook of International Financial Statistics, 1985, line 99 a.p or a.r, or line 99 b.p or b.r (GDP)

Degree of corporatism (corporatism index and corporatism rank order) : M. BRUNO & J. SACHS (1985), table 11.3 (p. 226).

Degree of nominal wage responsiveness (nominal responsiveness index and nominal wage responsiveness rank order) : idem, table 11.7 (p. 238).

Duration of agreement index, degree of indexation index, synchronization index : idem.

General budget balance, structural budget balance, structural budget balance net of (net) interest payments (all as percentage of GNP or GDP) : R. W. R. PRICE & P. MULLER (1984), table 1 (p. 36), table 2 (p. 37) and table 7 (p. 56).

Government share in employment : P. SAUNDERS & F. KLAU (1985), table 13 (p. 63).



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TABLE 1 : AVERAGE YEARLY WAGE INCREASE IN 8 LARGE INDUSTRIAL COUNTRIES AND IN 8 SMALLER EUROPEAN COUNTRIES

	Average yearly real wage increase		year of break
	First period of the 70s	Second period of the 70s+80s (1)	
Australia	5.0	0.8	1975
Canada	3.8	0.2	1977
France	5.4	2.8	1980
Germany	5.0	1.1	1975
Italy	7.4	3.0	1976
Japan	6.2	1.5	1976
United Kingdom	4.1	1.3	1974
United States	0.1	0.1	----
Average	4.6	1.4	
Stand. dev.	2.2	1.1	
Austria	5.4	1.4	1976
Belgium	7.4	0.8	1976
Denmark	5.5	0.1	1976
Ireland	5.7	0.9	1976
Netherlands	5.3	-0.9	1975
Norway	4.4	-0.4	1977
Sweden	5.6	0.3	1976
Switzerland	2.4	0.2	1973
Average	5.2	0.3	
Stand. dev.	1.4	0.7	

(1) End of sample period is 1984 except for Canada (1982), Austria, Denmark, Ireland and Switzerland (all 1983).

Table 2 : ESTIMATION RESULTS FOR THE EQUATION<sup>(1)</sup>

$$w = a + bp + cu + dq + cw_{-1}$$

Country	a	b	c	d	e	AR <sup>2</sup>	DW	SER	F	estimation period
Australia	5.85	0.87	-0.53			0.69	1.71	2.00	20.20	67-84
	4.68	6.33	-2.70							
Canada	3.62	0.52	-0.64		0.70	0.85	1.45	1.09	35.07	64-82
	3.87	4.26	-2.85		5.45					
France <sup>(2)</sup>	3.88	1.18	-0.28			0.76	2.24	1.91	39.85	60-84
	4.26	7.19	-1.49							
Germany <sup>(3)</sup>	7.59	0.53	-0.85			0.57	1.44	1.84	11.47	60-84
	5.51	1.72	-4.18							
Italy	9.84	1.03	-0.91			0.69	2.61	3.60	19.61	67-84
	3.63	6.26	-2.18							
Japan <sup>(3)</sup>	8.87	0.41	-3.09		0.39	0.88	1.97	1.61	42.46	61-84
	2.84	3.65	-2.89		2.54					
United Kingdom	2.86	0.88				0.81	1.98	2.25	103.44	60-84
	3.50	10.17								
United States	0.83	0.41	-0.37	0.52	0.74	0.88	1.92	0.77	44.67	61-84
	1.20	4.59	-3.12	3.70	5.32					
Austria	4.93	0.81	-0.88	0.53		0.59	1.86	1.81	12.15	61-84
	1.75	3.24	-1.42	2.88						
Belgium	5.97	1.32	-0.71			0.86	1.45	1.53	73.27	60-84
	9.26	11.42	-8.64							
Denmark	7.25	0.69	-0.50			0.39	1.75	2.19	8.38	60-83
	5.99	3.93	-2.99							
Ireland	7.10	0.95	-0.49			0.69	2.11	2.97	26.82	60-83
	4.51	6.46	-1.70							
Netherlands	3.60	0.90	-0.43	0.49		0.62	1.77	2.38	13.59	61-84
	2.07	4.10	-3.32	1.77						
Norway	3.39	0.60	-1.24		0.37	0.44	1.40	2.72	6.29	64-84
	1.43	2.72	-1.43		2.20					
Sweden	10.78	0.61	-2.35			0.23	1.56	3.24	4.03	64-84
	3.56	2.42	-1.92							
Switzerland	2.82	0.71	-2.88			0.71	2.06	1.21	29.26	60-83
	4.64	6.04	-2.76							

(1) After reestimation leaving out insignificant variables.

(2) Alternatively, the following equation was estimated for France:

$$w = 3.41 + 0.83p + 0.59p_{-1} - 0.60u$$

$$(3.74) \quad (3.99) \quad (2.25) \quad (-2.77)$$

$$AR^2 = 0.80 \quad DW = 2.18 \quad SER = 1.72 \quad F = 31.72$$

estimation period: 61-84

(3) Estimated with CORC.

TABLE 3 : REAL WAGE RESPONSIVENESS AND RIGIDITY

Country	b	c	d	R1	R2
Australia	0.87	-0.53	-	1.62	1.62
Canada	0.52	-0.64	-	0.81	0.81
France	1.18	-0.28	-	4.27	4.27
Germany	0.53	-0.85	-	0.63	0.63
Italy	1.03	-0.91	-	1.14	1.14
Japan	0.41	-3.09	-	0.13	0.13
United Kingdom	0.88	-	-	-	-
United States	0.41	-0.37	0.52	1.10	-0.29
Average	0.73	-0.95		1.39	1.19
Stand. dev.	0.30	0.97		1.35	1.50
Austria	0.81	-0.88	0.53	0.93	0.33
Belgium	1.32	-0.71	-	1.85	1.85
Denmark	0.69	-0.50	-	1.37	1.37
Ireland	0.95	-0.49	-	1.92	1.92
Netherlands	0.90	-0.43	0.49	2.12	0.98
Norway	0.60	-1.24	-	0.49	0.49
Sweden	0.61	-2.35	-	0.26	0.26
Switzerland	0.71	-2.88	-	0.25	0.25
Average	0.82	-1.19		1.15	0.93
Stand. dev.	0.24	0.93		0.77	0.71

TABLE 4 : COEFFICIENT ON PRICE INFLATION VARIABLE  
AND ASSESSMENT OF SUCCESS OF EXPANSIONARY POLICY  
IN REDUCING REAL WAGE GROWTH

Country	Estimated coefficient on price inflation	
	short term	long term
a. unsuccessful		
Australia	0.87 (-0.99) (1)	0.87 (-0.99)
Austria	0.81 (-0.74)	0.81 (-0.74)
Belgium	1.32 (+2.75)	1.32 (+2.75)
France	1.18 (+1.14)	1.18 (+1.14)
Ireland	0.95 (-0.35)	0.95 (-0.35)
Italy	1.03 (+0.20)	1.03 (+0.20)
Netherlands	0.90 (-0.43)	0.90 (-0.43)
Sweden	0.61 (-1.52)	0.61 (-1.52)
United Kingdom	0.88 (-1.52)	0.88 (-1.52)
b. successful in short term only		
Canada	0.52 (-3.87)	1.74 (+5.99)
Norway	0.60 (-1.78)	1.04 (+0.16)
United States	0.41 (-6.63)	1.60 (+5.73)
c. successful		
Denmark	0.69 (-1.80)	0.69 (-1.80)
Germany	0.53 (-1.87)	0.53 (-1.87)
Japan	0.41 (-5.32)	0.67 (-2.97)
Switzerland	0.71 (-2.43)	0.71 (-2.43)

(1) Figures between brackets refer to t-value testing the hypothesis that b equals 1.

TABLE 5 : COEFFICIENT ON UNEMPLOYMENT VARIABLE  
AND ASSESSMENT OF SUCCESS OF DEFLATIONARY POLICY  
IN REDUCING REAL WAGE GROWTH

Country	Estimated coefficient on unemployment	
	short term	long term
Japan	-3.09	-5.07
Switzerland	-2.88	-2.88
Sweden	-2.35	-2.35
Canada	-0.64	-2.13
Norway	-1.24	-1.97
United States	-0.37	-1.42
Italy	-0.91	-0.91
Austria	-0.88	-0.88
Germany	-0.85	-0.85
Belgium	-0.71	-0.71
Australia	-0.53	-0.53
Denmark	-0.50	-0.50
Ireland	-0.49	-0.49
Netherlands	-0.43	-0.43
France	-0.28	-0.28
United Kingdom	-----	-----

TABLE 6 : ESTIMATION OF  $w = a + bp + (c_0 + c_1D)u + dq + ew_{-1}$ 

Country	a	b	$c_0$	$c_1$	d	e	AR <sup>2</sup>	DW	SER	F	estimation period
Canada	1.32	0.64		-0.32		0.50	0.91	2.13	0.84	62.21	64-82
	2.22	6.29		-4.87		5.65					
France	3.74	1.13		-0.27			0.79	2.33	1.82	45.09	60-84
	4.30	9.15		-2.17							
Japan	4.66	0.41		-1.53		0.41	0.88	1.54	1.54	61.97	61-84
	4.37	3.94		-4.62		4.04					
Austria	3.28	0.97		-0.76	0.34		0.66	2.07	1.65	15.86	61-84
	2.38	5.03		-2.52	1.78						
Denmark	5.58	0.64	1.02	-1.32			0.61	2.08	1.76	12.87	60-83
	5.16	4.57	2.27	-3.55							
Ireland	4.87	0.96		-0.35			0.73	2.21	2.77	32.21	60-83
	4.39	7.72		-2.52							
Norway	1.94	0.75		-1.31		0.34	0.53	1.53	2.50	8.56	64-84
	1.04	3.46		-2.38		2.15					
Sweden	4.81	0.98		-1.73			0.35	2.06	2.98	6.44	64-84
	2.56	3.47		-2.77							

TABLE 7 : DETERMINANTS OF REAL WAGE RIGIDITY

	a	b	R2
Labour market characteristics variables			
CI	1.65 [3.95]	-0.22 [-1.39]	0.14
CRO	0.76 [1.37]	0.05 [0.96]	0.07
NWRI	0.82 [1.15]	0.10 [0.59]	0.03
NWRRO	1.34 [2.01]	-0.01 [-0.22]	0.01
DAI	1.02 [1.82]	0.15 [0.40]	0.01
DII	0.27 [0.72]	0.82 [3.09]	0.44
SI	1.73 [3.89]	-0.43 [-1.49]	0.16
Stabilization policy variables			
GBB	1.19 [3.35]	-0.06 [-0.68]	0.04
GBBC	1.24 [2.16]	-0.02 [-0.19]	0.00
SBB	1.26 [3.99]	-0.05 [-0.58]	0.03
SBBC	1.46 [3.34]	0.04 [0.38]	0.01
SBBN	1.33 [4.53]	-0.00 [0.00]	0.00
SBBNC	1.38 [4.58]	0.08 [0.56]	0.03
GE	1.20 [1.30]	0.00 [0.06]	0.00
GEC	1.38 [3.34]	-0.03 [-0.38]	0.01

Note : Dependent variable is R1. The coefficient a stands for the constant, and b for the regression coefficient. t-values between brackets. The meaning of the explanatory variables is the following :

CI : corporatism index; CRO : corporatism rank order; NWRI : nominal wage responsiveness index; NWRRO : nominal wage responsiveness rank order; DAI : duration of agreement index; DII : degree of indexation index; SI : synchronization index; GBB : general government budget balance as a % of GNP or GDP (average for 1970-84); GBBC : change in general government budget balance etc. (average 1980-84 minus average 1970-74); SBB : structural budget balance etc. (average for 1970-84); SBBC : change in structural budget balance (as for GBB); SBBN : structural budget balance net of (net) interest payments etc. (average for 1970-84); SBBNC : change in structural budget balance net of (net) interest payments etc. (as for GBB); GE : share of government employment in total employment (average for 1970, 1975 and 1980); GEC : change in share of government employment in total employment (1980 minus 1970).



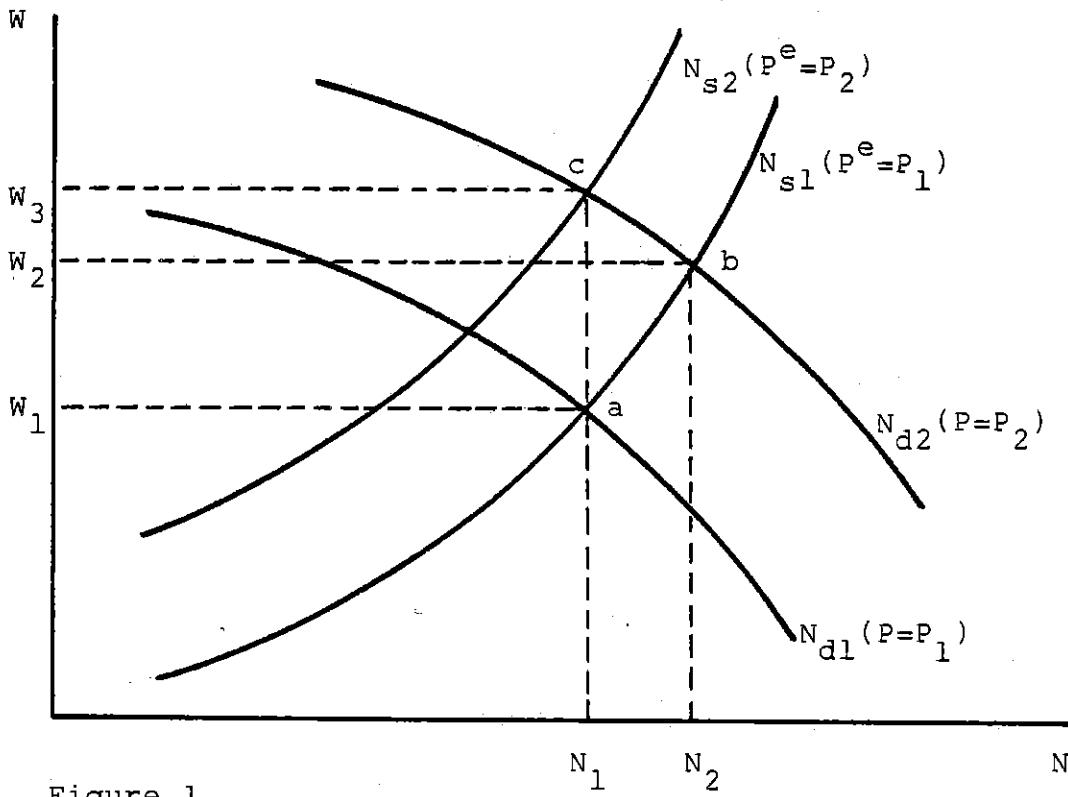


Figure 1

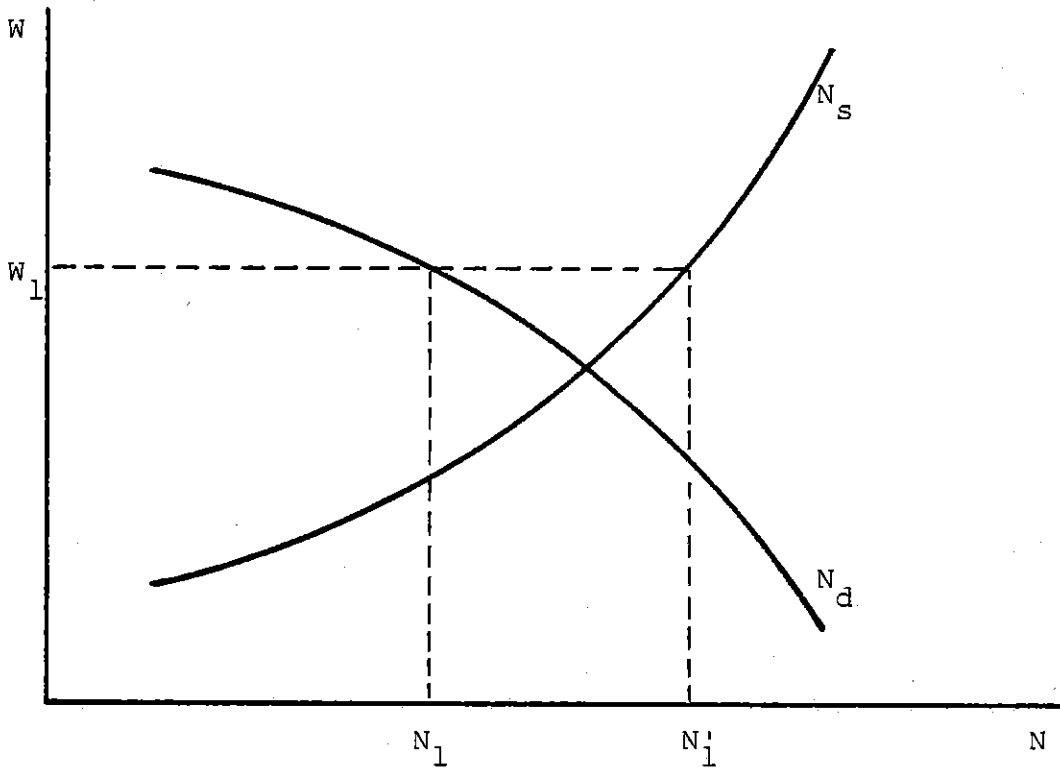


Figure 2

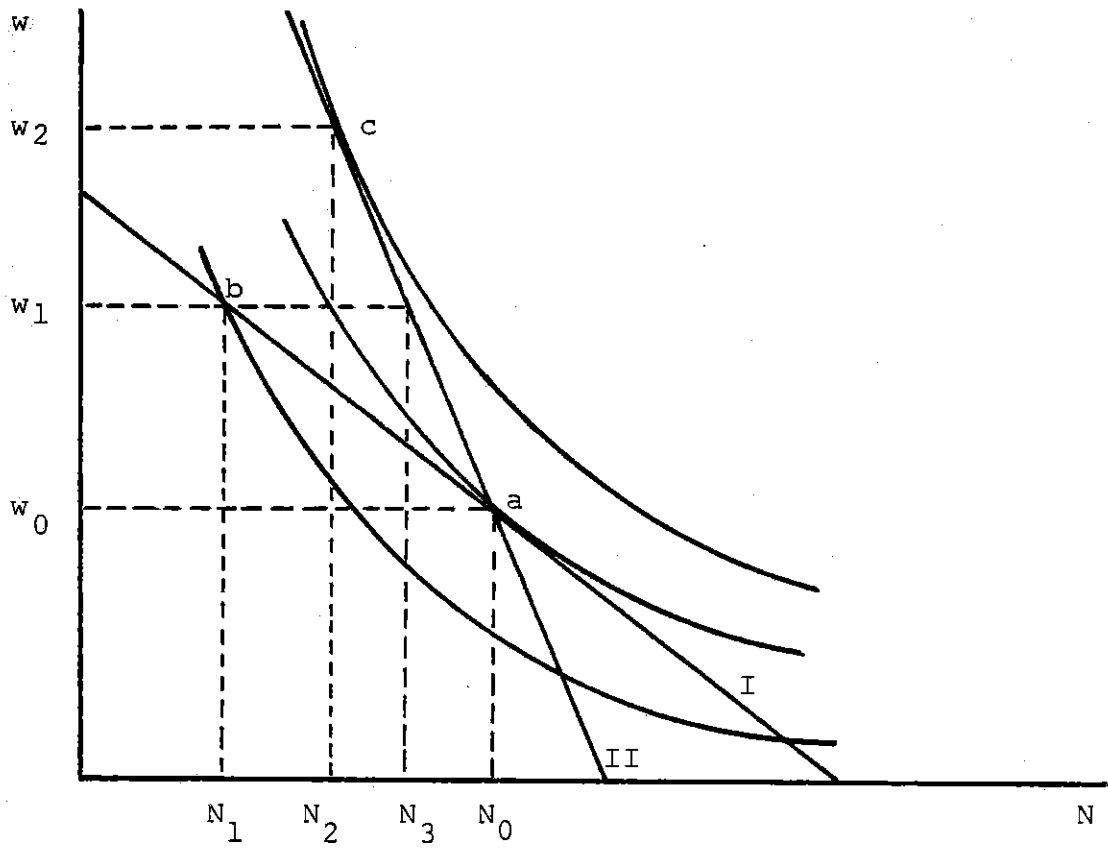


Figure 3

TABLE A1 : ESTIMATION RESULTS FOR THE BASIC EQUATION

$$w = a + bp + cu + dq + ew_{-1}$$

Country	a	b	c	d	e	AR <sup>2</sup>	DW	SER	F	estimation period
Australia	6.06	0.91	-0.54	-0.00	-0.05	0.65	1.68	2.15	8.80	67-84
	2.93	3.13	-2.53	-0.00	-0.21					
Canada	3.64	0.52	-0.64	-0.00	0.70	0.84	1.45	1.32	24.55	64-82
	2.94	3.09	-2.74	-0.02	5.09					
France	2.66	1.08	-0.31	0.13	0.15	0.75	2.27	1.94	17.96	61-84
	0.82	4.05	-1.30	0.25	0.76					
Germany	3.48	0.50	-0.56	0.28	0.31	0.56	1.53	1.88	8.28	61-84
	1.19	1.57	-2.22	0.81	1.44					
Italy	16.55	1.06	-1.14	-0.56	-0.24	0.67	2.47	3.47	9.18	68-84
	3.59	4.42	-2.62	-1.36	-1.17					
Japan	3.34	0.51	-1.66	0.22	0.50	0.88	1.12	1.59	43.66	61-84
	1.00	4.07	-1.53	1.51	4.76					
United Kingdom	1.87	1.04	0.05	0.34	-0.13	0.78	1.87	2.41	21.28	61-84
	1.26	4.38	0.25	1.03	-0.56					
United States	0.83	0.41	-0.37	0.52	0.74	0.88	1.92	0.77	44.67	61-84
	1.20	4.59	-3.12	3.70	5.32					
Austria	2.83	0.59	-0.57	0.46	0.31	0.63	2.12	1.72	10.72	61-84
	0.96	2.13	-0.92	2.60	1.71					
Belgium	6.73	1.28	-0.74	-0.13	0.00	0.83	1.31	1.63	29.61	61-84
	4.30	4.75	-5.71	-0.57	0.01					
Denmark	6.34	0.41	-0.45	-0.16	0.30	0.34	1.90	2.18	3.78	61-83
	2.34	1.59	-2.65	-0.51	1.61					
Ireland	5.47	1.04	-0.47	0.33	-0.06	0.65	2.11	3.12	11.44	61-83
	2.12	4.66	-1.51	0.90	-0.30					
Netherlands	2.79	0.77	-0.37	0.49	0.16	0.61	2.02	2.40	10.18	61-84
	1.39	2.72	-2.49	1.75	0.81					
Norway	2.58	0.65	-1.33	0.21	0.40	0.42	1.43	2.88	4.36	64-84
	0.72	2.34	-1.42	0.40	2.14					
Sweden	10.26	0.51	-2.17	-0.08	0.11	0.15	1.78	3.41	1.89	64-84
	1.71	1.23	-1.60	-0.12	0.42					
Switzerland (a)	1.69	0.68	-1.83	0.15	0.11	0.62	2.80	1.77	5.41	72-83
	0.72	1.72	-0.60	0.41	0.43					
(b)	2.68	0.62	-3.02	n.a.	0.10	0.69	2.34	1.24	17.51	61-83
	3.56	3.72	-2.76	-	0.69					

n.a. : not available (data for labour productivity for Switzerland missing for the period 61-71).

TABLE A2 : ESTIMATION OF  $w = a_0 + a_1 D + bp + cu + dq + ew_{-1}$ 

Country	$a_0$	$a_1$	b	c	d	e	AR <sup>2</sup>	DW	SER	F	estimation period																																																																																																																																										
Canada	1.40	-2.72	0.66			0.48	0.91	2.33	0.84	63.68	64-82																																																																																																																																										
	2.40	-4.96	6.43			5.42						France	3.60	-2.50	1.16				0.79	2.40	1.79	47.02	60-84	4.14	-2.37	9.23				Japan	4.51	-3.49	0.42			0.43	0.90	1.70	1.48	67.29	61-84	4.55	-4.96	4.20			4.34	Austria	8.70	-2.90	0.72	-1.16			0.69	1.97	1.59	17.76	61-84	4.56	-4.09	3.50	-2.35			Denmark	6.43	-3.94	0.74				0.50	1.79	1.99	12.53	60-83	5.70	-3.94	4.67				Ireland	4.87	-3.34	0.95				0.71	2.04	2.86	29.63	60-83	4.24	-2.17	7.23				Norway	1.95	-4.05	0.89			0.29	0.66	1.93	2.12	14.04	64-84	1.23	-3.79	4.64			2.18	Sweden	4.32	-4.77	1.08				0.34	2.02	3.01	6.08	64-84	2.19	-2.66	3.46				Switzerland	2.38	-1.66	0.89				0.75	2.55	1.11	36.03	60-83
France	3.60	-2.50	1.16				0.79	2.40	1.79	47.02	60-84																																																																																																																																										
	4.14	-2.37	9.23									Japan	4.51	-3.49	0.42			0.43	0.90	1.70	1.48	67.29	61-84	4.55	-4.96	4.20			4.34	Austria	8.70	-2.90	0.72	-1.16			0.69	1.97	1.59	17.76	61-84	4.56	-4.09	3.50	-2.35			Denmark	6.43	-3.94	0.74				0.50	1.79	1.99	12.53	60-83	5.70	-3.94	4.67				Ireland	4.87	-3.34	0.95				0.71	2.04	2.86	29.63	60-83	4.24	-2.17	7.23				Norway	1.95	-4.05	0.89			0.29	0.66	1.93	2.12	14.04	64-84	1.23	-3.79	4.64			2.18	Sweden	4.32	-4.77	1.08				0.34	2.02	3.01	6.08	64-84	2.19	-2.66	3.46				Switzerland	2.38	-1.66	0.89				0.75	2.55	1.11	36.03	60-83	4.79	-3.53	8.31															
Japan	4.51	-3.49	0.42			0.43	0.90	1.70	1.48	67.29	61-84																																																																																																																																										
	4.55	-4.96	4.20			4.34						Austria	8.70	-2.90	0.72	-1.16			0.69	1.97	1.59	17.76	61-84	4.56	-4.09	3.50	-2.35			Denmark	6.43	-3.94	0.74				0.50	1.79	1.99	12.53	60-83	5.70	-3.94	4.67				Ireland	4.87	-3.34	0.95				0.71	2.04	2.86	29.63	60-83	4.24	-2.17	7.23				Norway	1.95	-4.05	0.89			0.29	0.66	1.93	2.12	14.04	64-84	1.23	-3.79	4.64			2.18	Sweden	4.32	-4.77	1.08				0.34	2.02	3.01	6.08	64-84	2.19	-2.66	3.46				Switzerland	2.38	-1.66	0.89				0.75	2.55	1.11	36.03	60-83	4.79	-3.53	8.31																																	
Austria	8.70	-2.90	0.72	-1.16			0.69	1.97	1.59	17.76	61-84																																																																																																																																										
	4.56	-4.09	3.50	-2.35								Denmark	6.43	-3.94	0.74				0.50	1.79	1.99	12.53	60-83	5.70	-3.94	4.67				Ireland	4.87	-3.34	0.95				0.71	2.04	2.86	29.63	60-83	4.24	-2.17	7.23				Norway	1.95	-4.05	0.89			0.29	0.66	1.93	2.12	14.04	64-84	1.23	-3.79	4.64			2.18	Sweden	4.32	-4.77	1.08				0.34	2.02	3.01	6.08	64-84	2.19	-2.66	3.46				Switzerland	2.38	-1.66	0.89				0.75	2.55	1.11	36.03	60-83	4.79	-3.53	8.31																																																			
Denmark	6.43	-3.94	0.74				0.50	1.79	1.99	12.53	60-83																																																																																																																																										
	5.70	-3.94	4.67									Ireland	4.87	-3.34	0.95				0.71	2.04	2.86	29.63	60-83	4.24	-2.17	7.23				Norway	1.95	-4.05	0.89			0.29	0.66	1.93	2.12	14.04	64-84	1.23	-3.79	4.64			2.18	Sweden	4.32	-4.77	1.08				0.34	2.02	3.01	6.08	64-84	2.19	-2.66	3.46				Switzerland	2.38	-1.66	0.89				0.75	2.55	1.11	36.03	60-83	4.79	-3.53	8.31																																																																					
Ireland	4.87	-3.34	0.95				0.71	2.04	2.86	29.63	60-83																																																																																																																																										
	4.24	-2.17	7.23									Norway	1.95	-4.05	0.89			0.29	0.66	1.93	2.12	14.04	64-84	1.23	-3.79	4.64			2.18	Sweden	4.32	-4.77	1.08				0.34	2.02	3.01	6.08	64-84	2.19	-2.66	3.46				Switzerland	2.38	-1.66	0.89				0.75	2.55	1.11	36.03	60-83	4.79	-3.53	8.31																																																																																							
Norway	1.95	-4.05	0.89			0.29	0.66	1.93	2.12	14.04	64-84																																																																																																																																										
	1.23	-3.79	4.64			2.18						Sweden	4.32	-4.77	1.08				0.34	2.02	3.01	6.08	64-84	2.19	-2.66	3.46				Switzerland	2.38	-1.66	0.89				0.75	2.55	1.11	36.03	60-83	4.79	-3.53	8.31																																																																																																									
Sweden	4.32	-4.77	1.08				0.34	2.02	3.01	6.08	64-84																																																																																																																																										
	2.19	-2.66	3.46									Switzerland	2.38	-1.66	0.89				0.75	2.55	1.11	36.03	60-83	4.79	-3.53	8.31																																																																																																																											
Switzerland	2.38	-1.66	0.89				0.75	2.55	1.11	36.03	60-83																																																																																																																																										
	4.79	-3.53	8.31																																																																																																																																																		

