

# On the Convergence of Wage Policy

## after EMU

by  
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### 1 Wage Development and Convergence in the Run-Up to Monetary Union

With the introduction of European Economic and Monetary Union (EMU), wage policy is being allocated a decisive role in the EU member states. With the loss of sovereignty over an independent monetary policy and an independent currency, differences in inflation rates in tradable goods between the individual countries are no longer possible. If regional competitiveness is not to be endangered, in a monetary fully integrated market nominal wage increases are limited by the expected productivity growth in the home country and the trend of unit labour costs in the other countries. This restriction is also true for social security systems, which are financed by employers contributions: if contribution rates rise, wage policy must take such increases into account so as not to affect unit labour costs. Sanctions in the case of damage to price stability, which manifests itself in rising unemployment, no longer occur with a pronounced delay (as would be the case with national monetary policy, which may initially tolerate a higher inflation rate and only later takes a restrictive course) but immediately, with the loss of regional competitiveness. This increases the pressure for fast wage adjustment. Furthermore, European monetary policy imposes a more general restriction for wage policy throughout Europe.

Consequently, this is a significant difference from a system of flexible exchange rates. In the latter type of monetary system, individual economies whose international competitiveness is lagging behind that of their trade partners – for example because their process of wage formation is more inflationary – maintain their competitiveness at least in the short term by means of currency devaluation. In the context of a stylized Phillips curve, as is shown in Figure 1, this means that countries with different response functions of wage policy given the same (natural) unemployment rate  $\bar{U}$  show varying or stable inflation rates ( $\hat{p}_A, \hat{p}_B, \hat{p}_C$ ). If these countries agree upon a system of absolutely fixed exchange rates or a monetary union with the goal of a common inflation rate of, for example,  $\hat{p}_A$ , the unemployment rate development depends on whether the process of wage formation, and with it the respective Phillips curve, move in the direction of the country which, functioning as a stability anchor, determines the inflation rate. In this case, all countries would show the same combination of unemployment and inflation. If the Phillips curves remain unchanged, however, a convergence of inflation rates can only be reached with different unemployment rates. For a sustainably successful monetary Union, the central question is therefore whether or not the countries striving to join a monetary union show comparable labor market

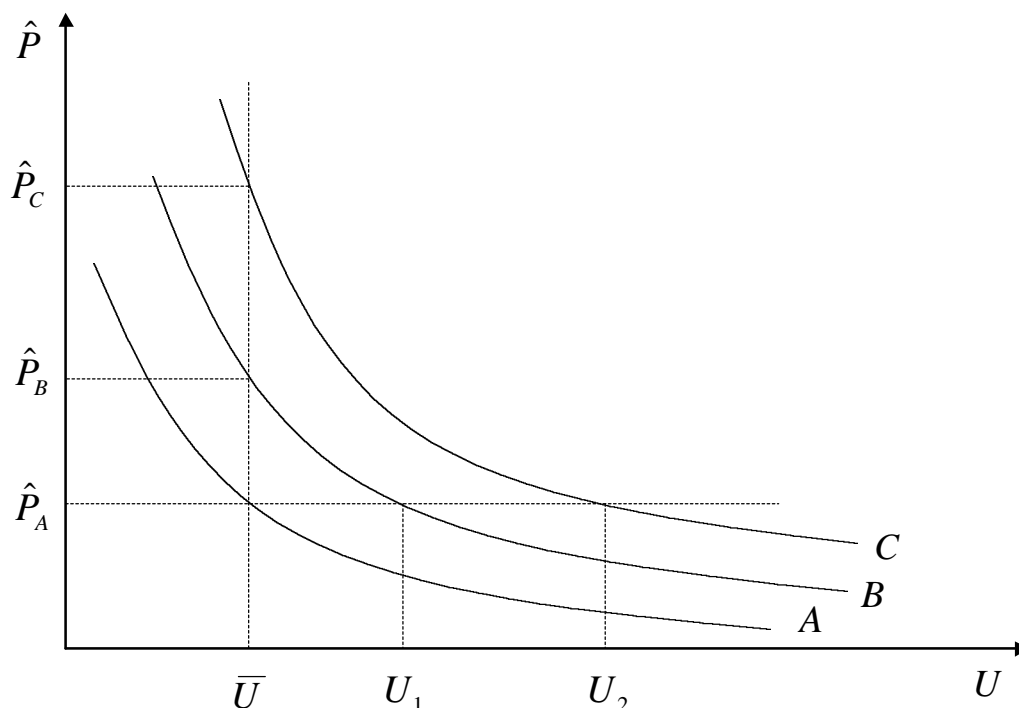
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<sup>1</sup> This paper is broadly based on chapter 3 of Horn, Gustav-A., Wolfgang Scheremet and Rudolf Zwiener, „Wages and the Euro“, Physica Verlag, Berlin 1999.

flexibility, as demonstrated by a common Phillips curve, following the introduction of the common currency. The relationship between wage policy and monetary policy, which used to be determined at the national level for countries with independent currencies, will now be determined at the European level.

The mere anticipation of these restrictions in the process of European unification led to nominal wage increases in the European countries becoming more closely aligned since the mid-1980s. This trend had been very different in the mid-1970s, when both monetary and wage policies in the individual western European countries reacted very differently to increased import prices following the oil price shocks (cf. figures 2 and 3).

Figure 1



While some economies immediately returned to a stability-oriented path, wage increases and inflation remained high in others. This variation in the rates of price increases in those countries now participating in Economic and Monetary Union is illustrated by the development of standard deviations of inflation rates (cf. figure 4). In those countries striving for price stability – i.e., Germany, Austria, the Netherlands, and Belgium – inflation differed only marginally immediately after the increase in oil prices and then also rapidly converged again. During this period, Germany demonstrated the lowest price increases within the EMS. This development was reflected in more or less constant exchange rates between the currencies of these countries. However, when examining all countries, inflation rates did deviate considerably in the 1970s, resulting in pronounced fluctuations of currency relations (cf. figure 3). This trend only visibly changed in the early 1980s. Although inflation accelerated at this time too, because of renewed oil price increases, inflation rates fell significantly – due to a restrictive monetary policy and an orientation along German stability levels from about 1985 onwards. As a result, price increases in Europe inched closer together, and the deviation in inflation rates weakened noticeably. In view of putting in place a common currency, this process – both in terms of the levels and as regards deviations – has progressed even further since the early 1990s. At the start of EMU, the rates of price increases within the EU – as well as increases in average incomes – hardly differ from each other.

In the course of this nominal convergence process, two country groups have emerged. One group – consisting of Germany, Austria, the Netherlands, and Belgium – demonstrated a quite similar development regarding inflation and unemployment indicators, as well as more or less constant exchange rates. The overwhelming majority of countries examined, differed considerably from this first group. In order to

conceptually distinguish between the two groups in this study, the countries in the first group will be referred to as "hard-currency countries," and those of the second group as "soft-currency countries," even if these terms no longer apply due to the nominal convergence of inflation rates during the 1990s.

Figure 2

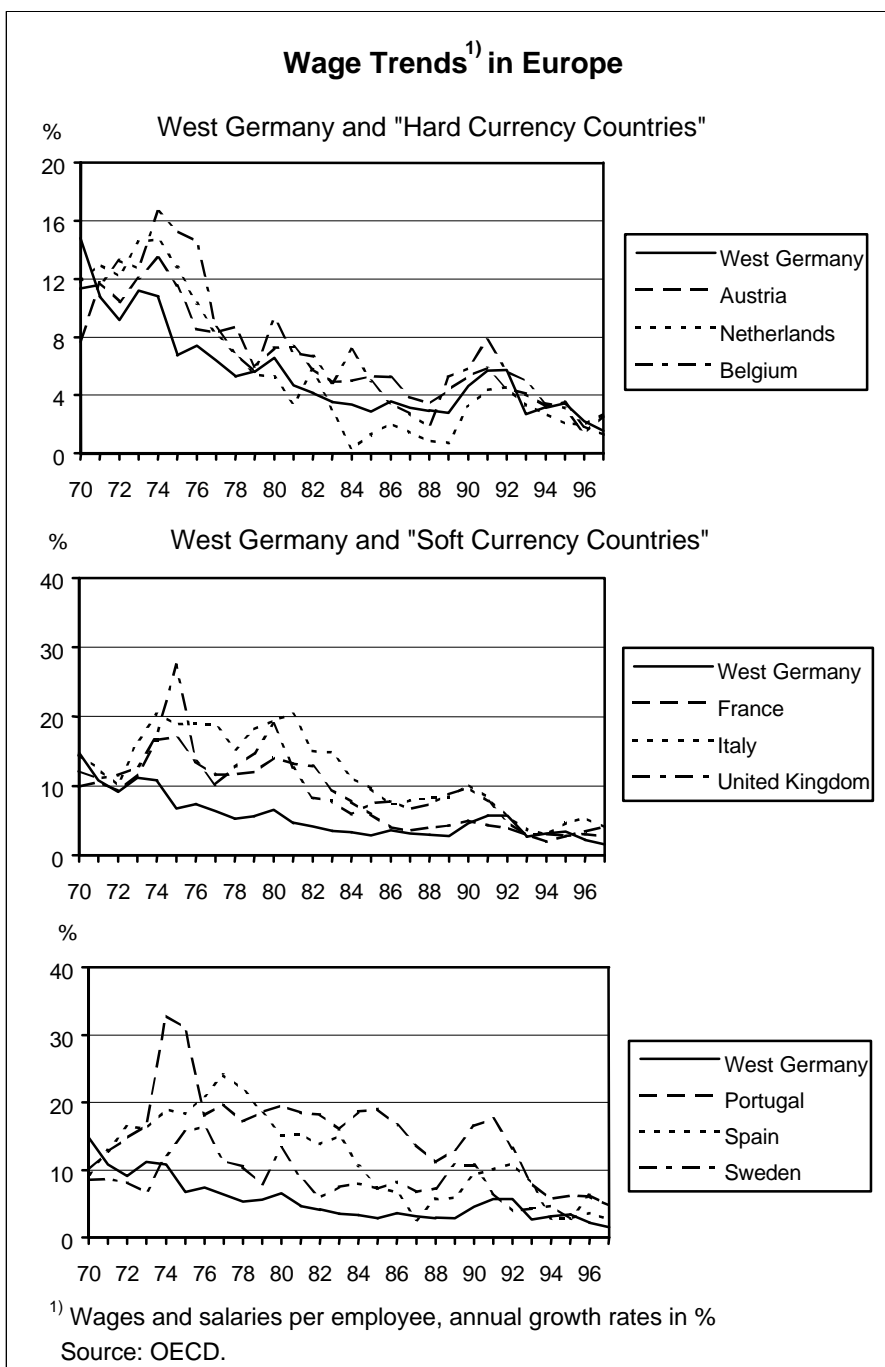
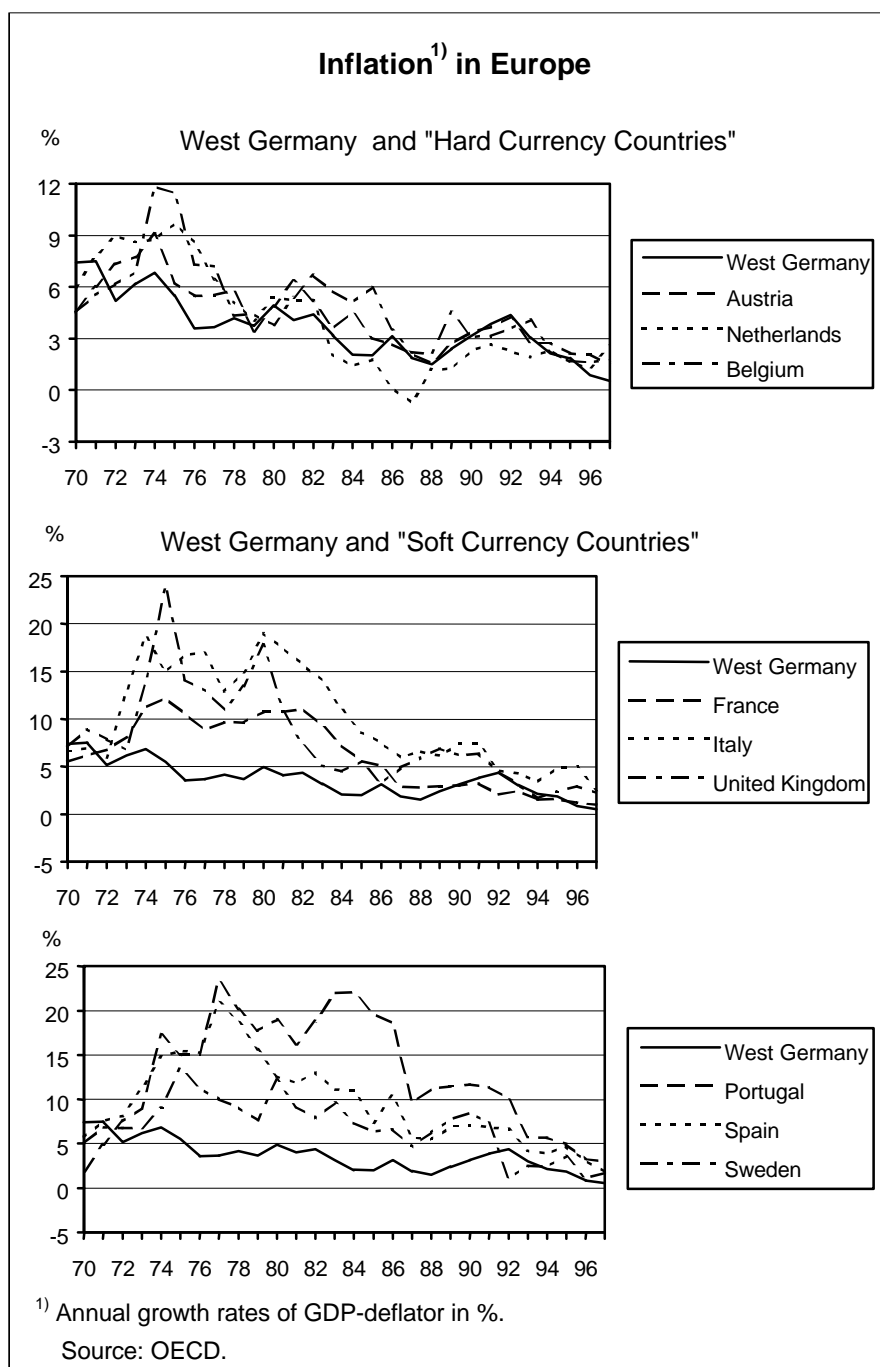
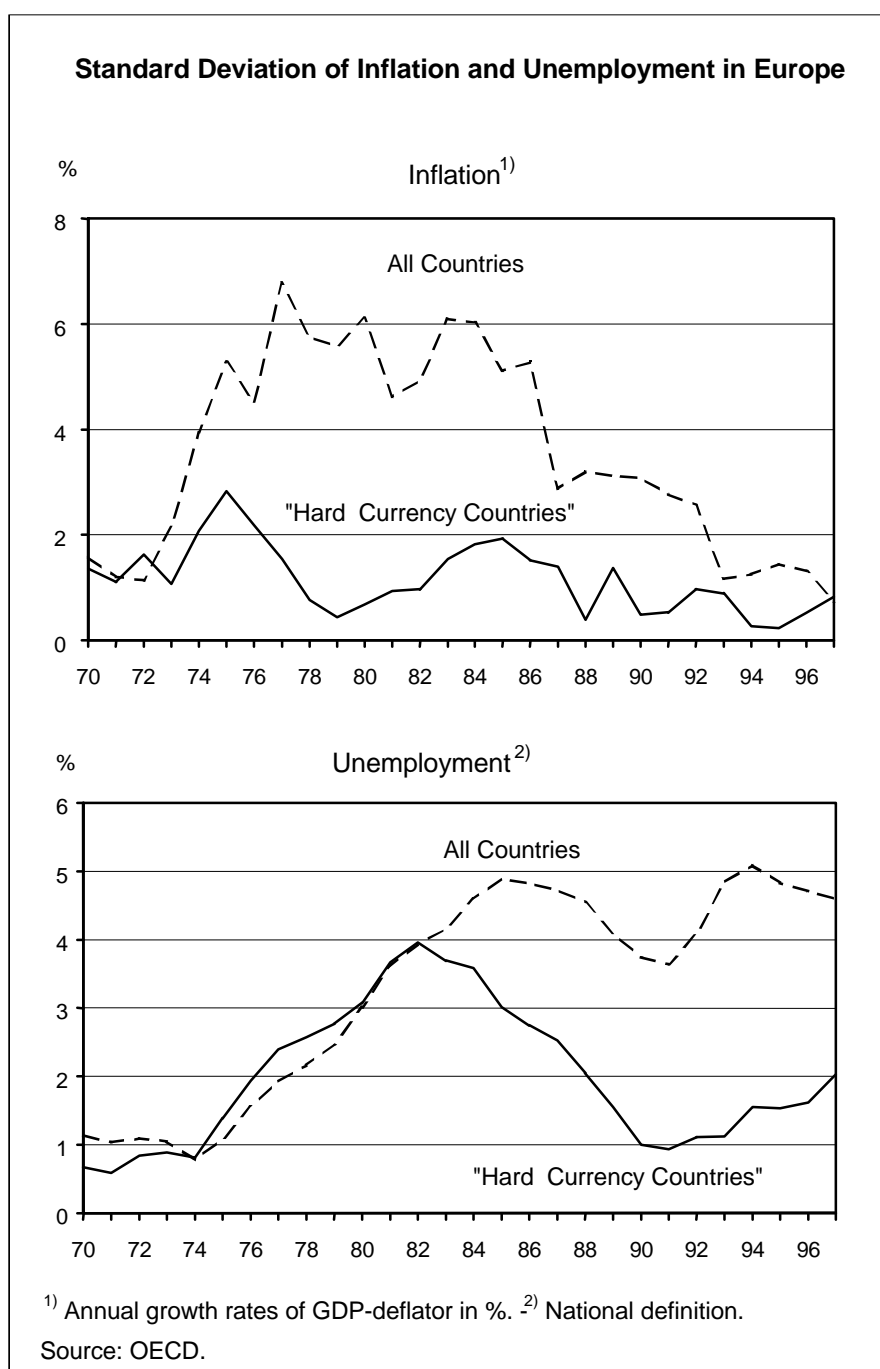


Figure 3



Regarding the unemployment rates, a similar adjustment as in the case of inflation was not observed (cf. figure 4). In the course of the explosion in oil prices the level of unemployment as well as the variation of unemployment across countries in Europe increased. While they tended to converge again during the 1980s in those countries whose currencies tendentially appreciated, the standard deviation across all countries remained virtually constant and even widened in the 1990s. Against this background, this begs the question as to how far Europe's labour markets have actually adjusted. Is the convergence of inflation really a sufficient condition for a successful monetary union, if it is only achieved under the pressure of different unemployment levels? In the short term, different unemployment levels can be compatible with a common currency. If, however, real convergence does not come about in the long term, or, rather, labour markets grow apart in the case of a new negative supply-side shock, demands for transfers would surely

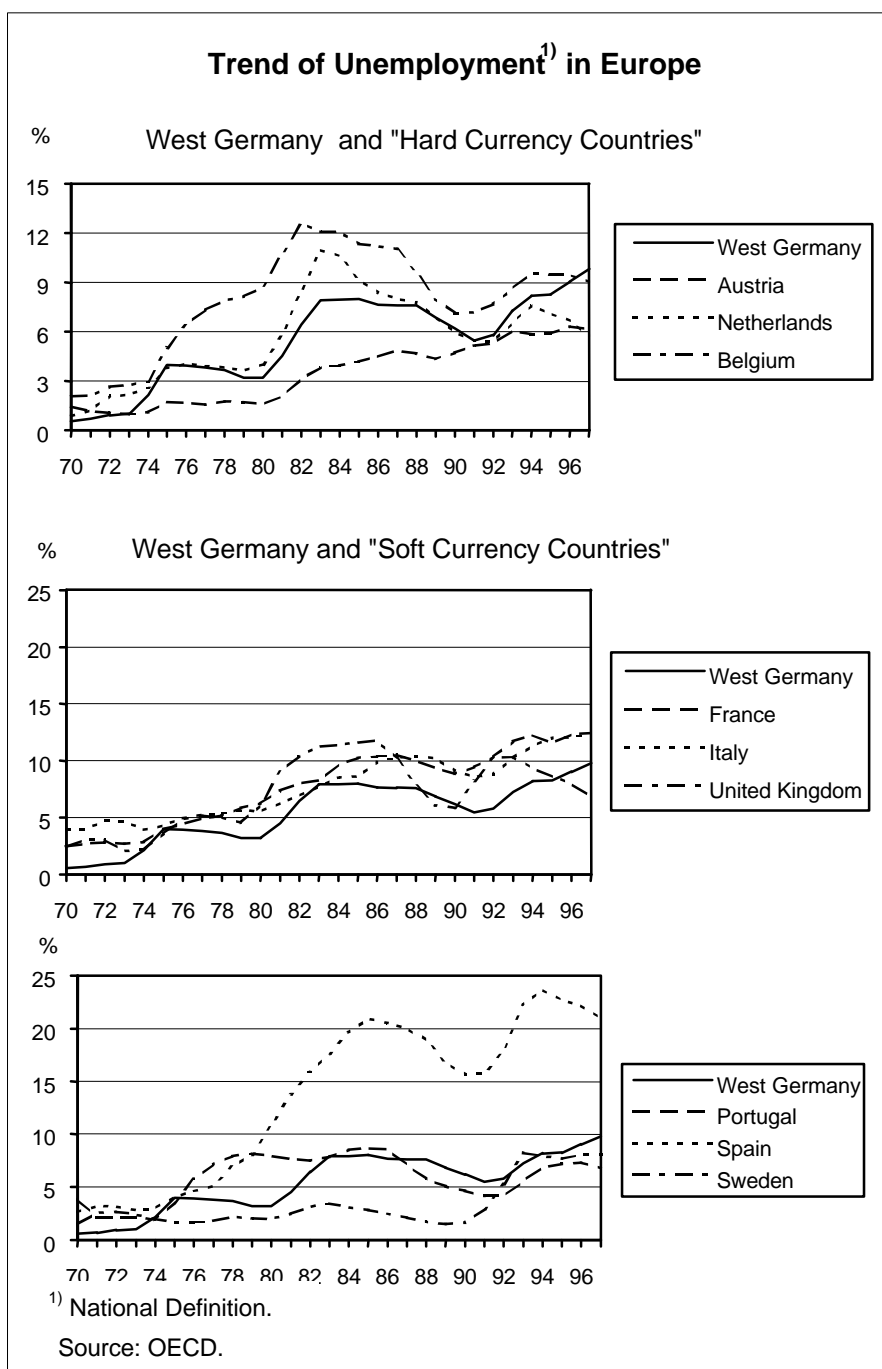
Figure 4



materialise, and political instabilities could appear within the monetary union. To avoid this, the labour markets in the participating countries must demonstrate a similar degree of labour market flexibility over the long term leading in the end to a convergence of unemployment rates.

According to the institutional arrangements the wage formation processes differ extremely among EU-member states. This concerns not so much the level of wage bargaining (i.e. the company, industry, or national level) as the organisational forms of the unions (i.e., industry, professional or politically oriented unions) as well as the intensity of macroeconomic co-ordination (cf. table 1). This renders a straightforward classification of wage formation in Europe very difficult. Furthermore, in some EU countries the wage formation process has been subjected to some fundamental changes. While, e.g., decentralising

Figure 5



elements have been on the increase in the United Kingdom, Sweden, and Germany, a centralising tendency has been noticeable in Italy and, to a lesser extent, in Portugal.

The assessment of this development is by no means uniform, however. On the one hand, against the backdrop of increased openness of goods markets the higher spread of labour incomes and the pronounced consideration of company interests and concerns are seen as a central economic contribution to overcome employment problems in Europe. On the other, economies which centralised wage bargaining structures exhibit a favourable economic performance compared to European standards. However, if the degree of centralisation in the wage formation process has an influence on the growth path of productivity and

Table 1

## National Arrangement of Wage Bargaining and Wage-Setting Institutions in EU Countries

country	Organisational density <sup>1)</sup>		Distribution of collective wage agreements <sup>2)</sup> in %	Level of wage bargaining 1 = national; 2 = industry, 3 = enterprise, ( ) = most important level, → direction of change	macroeconomic co-ordination		explanatory notes
	Unions	Employers Associations			co-ordination	implementation	
<b>Belgium</b>	high	high	90	(1), (2), 3	institutionalised	limited	political unions; tripartite agreements on the national level, duty to refrain from industrial disputes.
<b>Germany</b>	medium	high	90	1, (2), →3	informal	intensive	industrial; generally no interference by the state, duty to refrain from industrial disputes
<b>France</b>	low	high	92	1, (2), →3	institutionalised	limited	political unions, government may declare collective agreements generally binding, interference and arbitration by the state, no umbrella association of the employers, no duty to refrain from industrial disputes
<b>United Kingdom</b>	medium	low	20 <sup>3)</sup> 47 <sup>4)</sup>	2, (→3)	not existent	low	professional unions; no interference by the state
<b>Ireland</b>	medium	medium	-	(1), 2, 3	institutionalised	intensive	industrial and professional unions; tripartite agreements on policy programs, no duty to refrain from industrial disputes
<b>Italy</b>	medium	medium		→1, (2), 3	institutionalised (since the early 1990s)	previously low, increasingly intensive	political unions; nation-wide agreements on employment conditions, tripartite talks on the national level
<b>Netherlands</b>	low	high	85	1, (2), 3	institutionalised	intensive	industrial unions; tripartite framework agreement
<b>Austria</b>	high	high	98	1, (2)	informal	intensive	industrial unions; generally no interference by the state
<b>Portugal</b>	medium	high	90	→1, (2), 3	institutionalised	limited	political and professional unions; tripartite framework agreement
<b>Sweden</b>	high	high	83	1, →(2), →3	institutionalised	limited	industrial unions; generally no interference by the state
<b>Spain</b>	low	high	68	1, →(2), 3	institutionalised	low	political unions; generally no interference by the state

<sup>1)</sup> Organisational density: low: below 30 % - 50 %, high: more than 50 % of employees. <sup>2)</sup> in % of non farm employees. <sup>3)</sup> collective agreements in the industry level.  
<sup>4)</sup> collective agreements on the enterprise level.  
Sources: Fröhlich, H.-P. and others (1994), S. 59, Lesch, H. (1995), p. 76, Mc Morrow, K. (1996), p. 97, OECD (1994), p. 11, Schnabel, C. (1995), p. 110.

incomes on the one hand and labour market flexibility on the other, regional disparities in Europe with respect to real incomes can develop if wage negotiation systems continue to differ – all of which could make it more difficult for the European Union to converge economically and politically.

## 2 Labour Market Flexibility in a Common Currency Area

One of the central demands made regarding the creation of a single currency in Europe is the transition to greater labour market flexibility. Especially when exchange rates no longer act as a buffer between different economies, wage policy, it is argued, ought to be flexible enough to balance out asymmetrical shocks, something that can only be achieved by comprehensive institutional reforms. However, the term “labour market flexibility” is interpreted in a variety of ways. Very generally defined, the degree of labour market flexibility measures the speed at which an economy adjusts to an exogenous shock. This can refer to many areas, such as taxation and social insurance systems, labour law, the institutional organisation of the wage determination process and its ability to adjust to cyclical and structural changes. As regards the question of labour market flexibility in a common currency area, the flexibility of wage policy is of particular significance in view of the adjustment to real or nominal shocks.

### 2.1 Some Theoretical Considerations

The underlying theory is provided by the imperfect competition model<sup>2</sup> which states that on the labour market, unions bargain with firms over nominal wage increases while on the product market, firms have sufficient market power to set the price as a mark-up over marginal cost. In principle, unions have an incentive to demand higher wages while firms aim at higher prices. Assuming money supply is given, there is a rate of unemployment that equilibrates the desired mark-up over wages of prices by unions (the real wage) with the desired mark-up of prices over wages by firms (the unit profit). According to such a price formation, the price level is a mark-up ( $A$ ) on unit labour costs ( $ULC$ ), according to

$$P = ULC(1 + A) \quad (1)$$

with

$$ULC = W \cdot N / Y_t = W / Q$$

where  $W$  is the wage rate per employee,  $N$  is the number of employees,  $Y_t$  is real GDP, and  $Q$  is labour productivity. In logarithmic differentials, the formula is

$$\Delta p = \Delta w - \Delta q + \Delta a$$

Lower case letters denote a logarithmic representation,  $\Delta$  indicate first differences with respect to time. During the course of an economic cycle, the mark-up will not remain constant, but will, depending on the demand conditions, vary on the goods market;  $\Delta a$  is therefore proportional to demand ( $d\Delta Y_d$ ). Employment, in turn, develops analogous to Okun’s Law, according to  $\Delta Y_d = \tau \cdot \Delta N$ . With a constant labour supply, this can also be formulated as  $\Delta Y_d = \tau \cdot \Delta UR$ , where  $\Delta UR$  is the change in the unemployment rate. Prices then react according to the following equation:

$$\Delta p = \Delta w - \Delta q - g \cdot \Delta UR, \quad \text{with } g = d \cdot \tau. \quad (2)$$

$Dq$  is the target growth rate of real wages that keeps the unemployment rate constant. Hence, it reflects the productivity trend which is determined by capital accumulation and technical progress. In the long run equilibrium unemployment rate will be constant, so that  $DUR=0$ . Rearranging equation (1) with  $DUR=0$  yields

$$\Delta w = \Delta p + \Delta q \quad (3)$$

<sup>2</sup> Cf. Blanchard (1986), Franz (1996), Layard, Nickell, and Jackman (1991), Lindbeck (1993).

A wage policy recommendation can be deduced from equations (2) and (3). In order to keep unemployment constant, so that the actual unemployment rate and the “natural” unemployment rate do not deviate from each other, nominal wages must rise according to growth in productivity and the inflation rate. This rule of productivity oriented wage formation is applicable when the *ex-post* inflation rate and growth in productivity correspond to *ex-ante* anticipated values. In the absence of stochastic disturbances, actual productivity growth corresponds to long run trend productivity and the inflation corresponds exactly to the rate tolerated by the central bank. In the event of changes in the general economic conditions, an immediate reaction would be needed within the framework of a strict productivity orientation of wage policy.

The wage policy recommendation deduced in equation (2) and (3) requires that wages, prices and productivity are developing in a common trend or - in terms of time series analysis - that wages, prices and productivity are cointegrated. If this is true, a linear combination exists which itself is stationary. The linear combination of the levels of wages, prices and productivity can be written as

$$w_t \mathcal{G}_1 p_t - \mathcal{G}_2 q_t = z_t, \quad (4)$$

where  $z_t$  represents the share of labour income in nominal GDP if  $\gamma_1 = \gamma_2 = 1$ .<sup>3</sup> If the variables of interest are cointegrated, then  $z_t$  should be stationary. This would imply that there is a long run equilibrium between the levels of wages, prices and productivity and  $z_t$  is a stochastic variable, representing the short run deviations from this equilibrium.

Table 2

### Order of Integration<sup>1)</sup> of Time Series

	DE	AU	NL	BE	FR	UK	IT	PO	SP	SW
<b>Wages (w)</b>	2	2	2	2	2	2	2	2	2	2
<b>Trend productivity (<math>\pi^t</math>)</b>	2	2	2	2	2	2	2	2	2	2
<b>Price level (p)</b>	2	2	2	2	2	2	2	2	2	2
<b>Unemployment rate (UR)</b>	1	1	1	1	1	1	1 <sup>2)/2</sup>	1	1	1
<b>Labour's share (ls)</b>	1	1	1	1	1	1	1	1	1	1

Notes: 1) Augmented Dickey-Fuller Test; the null hypothesis of a unit root has been rejected at the 1% significance level. The values represent the order of integration. 2) rejected at 5% level of significance.  
All variables except the unemployment rate in logs.  
Wages(w): Monthly gross labour compensation per employee including employer's contributions to social security, total economy. Productivity(p): Actual real GDP per employee. Trend productivity ( $\pi^t$ ): Smoothed GDP per actual employment. GDP has been smoothed using a Hodrick-Prescott filter (smoothness parameter  $\lambda=1$ ). Price level (p) : GDP price deflator. Unemployment rate (UR): Registered unemployment in % of labour force, national definition. Labour's share: Share of labour income of nominal GDP,  $lq = \log(w) - \log(p) - \log(\pi)$   
Sources: *Germany*: German Institute of Economic Research, national accounts, *all other countries*: OECD .

Before estimating the cointegrating relations of wages, prices and productivity, we tested the order of integration of the time series. The empirical analysis is based on annual data for west Germany (DE), Austria (AU), the Netherlands (NL), Belgium (BE), France (FR), the United Kingdom (UK), Italy (IT), Portugal (P), Sweden (SW), and Spain (SP). Using annual data does have the disadvantage that information on wage dynamics - which is of particular relevance if wage negotiations take place at a specific point within a year that varies over time - is lost. However, it has the advantage that, on an annual basis,

<sup>3</sup>  $LS = (W*L)/YN = W / ((YR/N)*P) = W/P * 1/(YR/L) = \log(W) - \log(P) - \log(YR/L)$ .

consistent data is available for the period 1970-1997 for all countries examined.<sup>4</sup> The results of the tests on stationarity can be found in table 2. However, measured productivity is highly dependent on fluctuations of real GDP and does not necessarily reflect the actual potential capacity of the economy. Wage negotiations should therefore be based less on measured productivity than on trend productivity. For our empirical analysis, therefore, actual output has been smoothed using a Hodrick-Prescott filter for real GDP. The trend productivity variable has then been calculated by dividing the smoothed output series by actual employment.

However, first tests on cointegration of the levels of wages, prices and trend productivity, do not show clear results on a cointegrating relationship. While in most countries a Johansen test indicates a cointegrating relationship, a 2-stage augmented Dickey-Fuller test of equation (4) does not reject the null hypothesis of no cointegration. It seems to be that the linear combination of the levels of wages, prices and productivity which reflects the labour share is not stationary. The same results occur in tests on the order of integration of the actual labour share. In all countries, the labour share was not constant between the 1960s and the 1990s but increased in the late 1960s and the early 1970s and declined afterwards. The intuitive conclusion that the labour share is not stable is confirmed by formal tests on stationarity. In any country, tests reveal a unit root of the labour share, i.e., the labour share is not stationary. Taking these time series properties of wages, prices and trend productivity into consideration our analysis of the European wage determination process is based on cointegration of growth rates of wages, prices and productivity rather than on levels.

If wages, prices and productivity are cointegrated, then a long run equilibrium exists in the sense that wages, prices and productivity move according a common trend and actual unemployment is of the same magnitude as the structural/frictional unemployment (mismatch unemployment) in the sense of the Beveridge Curve and/or as the NAIRU. However, wage policy can react appropriately only to foreseeable changes. In the case of unexpected shocks, by contrast, *ex-post* inflation and productivity values deviate from expected *ex-ante* values and unemployment changes. In a negative supply shock in the form of a fall in productivity, inflation accelerates according to equation (2) if nominal wages do not fall to the same extent. This does not necessarily imply unemployment, however. If nominal wages react rigidly to an increase in inflation, prices rise more strongly than nominal wages. Real wages fall and unemployment remains constant. The new equilibrium path is only shaped by a higher inflation rate. However, if the central bank does not tolerate an increased devaluation in prices, it will react accordingly and pursue a restrictive course. In the wake of the nominal demand shock, unemployment rises. If wage policy reacts to the rise in unemployment immediately with lower wage agreements, the inflation rate will again fall rapidly and the central bank can return to a more expansive course. The same adjustment of wages is necessary if the central bank's inflation target changes, as was the case in many European countries in the 1980s. If wage policy does not consider the lower target rate of inflation, central banks will pursue a restrictive course. The cost of this nominal inertia is rising unemployment.

An exclusive productivity orientation is not sufficient to avoid permanently high unemployment, however. Miscalculations regarding anticipated productivity trends and delays also require taking unemployment into account. If it rises as a result of unexpected nominal or real shocks, a swift reaction on the part of wage policy is necessary, in which not only changes in unemployment, but also its level, should play a role. If unemployment falls, wage policy must remain on its moderate path to encourage a drop in inflation. The central bank is then in a position to relax the restrictive course and to accelerate the reduction in unemployment. Wage policy should therefore react asymmetrically to changes in unemployment – quickly in the event of rising, restrained in the event of falling unemployment. A similar strategy should be applied in adjustments to accelerating or decelerating inflation rates. If, for example, there is a short-term increase in inflation resulting from increases in value-added tax, nominal inertia can prevent the transposition of a one-off rise in price levels into a permanently higher inflation rate. However, if the central bank's inflation targets change, as was the case in many European countries in the 1980s, nominal inertia slows adjustment, and the costs – in the form of unemployment – rise.

To distinguish between short-run dynamics and, in brackets, an adjustment to an equilibrium in the long-run, we have chosen a model of error correction. Additionally to the long run cointegrating rela-

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<sup>4</sup> Definitions and sources of the used variables are listed in the notes of table 2

tionship of wage growth, the inflation rate and the productivity trend we have added the second differences of these variables as well as the unemployment rate. The wage equations have been formulated in second differences and have been estimated in the following specification.

$$\Delta^2 w_{t,i} = \alpha_{0,i} + \alpha_{1,i} \Delta^2 p_{t,i} + \alpha_{2,i} \Delta^2 q_{t,i} + \alpha_{3,i} U_{t,i} - \lambda_i [\Delta w_{t-1,i} - \alpha_{11,i} \Delta p_{t-1,i} - \alpha_{12,i} \Delta q_{t-1,i}] + \varepsilon_{t,i} \quad (5)$$

where

$w_{t,i}$	gross labour compensation per employee in country i
$p_{t,i}$	the GDP price index in country i
$q_{t,i}$	trend productivity in country i
$U_{t,i}$	unemployment rate in country i, national definition
$\varepsilon_{t,i}$	error term
$\Delta$	first difference
$\Delta^2$	second differences

Lower-case letters here stand for the logarithms of the corresponding variables.

We can also test for hysteresis and persistence in aggregate wage setting, if we include the change of the unemployment rate in the wage equation.<sup>5</sup> Replacing  $U_t$  by  $[U_t - U_t^*]$ , that is, the deviation of the actual unemployment rate from the structural unemployment rate ( $U_t^*$ ), (5) becomes

$$\Delta^2 w_{t,i} = \alpha_{0,i} + \alpha_{1,i} \Delta^2 p_{t,i} + \alpha_{2,i} \Delta^2 q_{t,i} + \alpha_{3,i} [U_{t,i} - U_{t,i}^*] - \lambda_i [\Delta w_{t-1,i} - \alpha_{11,i} \Delta p_{t-1,i} - \alpha_{12,i} \Delta q_{t-1,i}] + \varepsilon_{t,i}$$

If  $U_t^*$  does not only depend on the structural characteristics of the labour market ( $Z_t$ ) but also on the unemployment rate of the previous year,

$$U_{t,i}^* = \gamma_{1,i} Z_{t,i} + \gamma_{2,i} U_{t-1,i},$$

we obtain

$$\Delta^2 w_{t,i} = \alpha'_{0,i} + \alpha_{1,i} \Delta^2 p_{t,i} + \alpha_{2,i} \Delta^2 q_{t,i} + \alpha_{3,i} (1 - \gamma_2) U_{t,i} + \alpha_3 \gamma_2 \Delta U_{t,i} - \lambda_i [\Delta w_{t-1,i} - \alpha_{11,i} \Delta p_{t-1,i} - \alpha_{12,i} \Delta q_{t-1,i}] + \varepsilon_{t,i} \quad (6)$$

$$\text{with } \alpha'_{0,i} = \alpha_{0,i} - \alpha_{3,i} \gamma_{1,i} Z_{t,i}$$

Three cases can be distinguished: (i) Only changes in the unemployment rate are significant ( $\gamma_{2,i} = 1$ ). In this case, ‘insiders’ (job holders) negotiate wages that are just high enough to guarantee their own employment, while disregarding unemployment among outsiders.<sup>6</sup> This would imply full hysteresis. (ii) Both changes and levels affect wage growth; hence we have persistence in wage bargaining ( $0 < \gamma_2 < 1$ ). (iii) Only the level of the unemployment rate has a significant effect on wage growth ( $\gamma_2 = 0$ ). Wages would then be determined according to the pure Phillips curve model. Any deviation of the present rate of inflation from the structural unemployment rate would merely result from a sluggish adjustment of prices and nominal wages to exogenous shocks (nominal rigidities), compared to a full or partial ‘ratchet effect’ that emerges if real wages are downwardly inflexible (real rigidities).

Concepts to use in the measurement of both real wage and nominal wage rigidity can be derived from equations (1') and (2).<sup>7</sup> Real wage rigidity describes the extent to which unemployment rises as a conse-

<sup>5</sup> See Hansen (1991), Franz, Gordon (1993), Fitzenberger (1995), Franz (1996).

<sup>6</sup> Note that increasing unemployment in the present period implies job losses of insiders. This restrains their wage demand. However, the stock of unemployment does not affect wage setting, if cost of labour turn-over, social norms and harassment prevent unemployed outsiders from underbidding the wages of the employed insiders; see Lindbeck (1993), pp. 37-47, and, in more detail, Lindbeck and Snower (1988).

<sup>7</sup> For a derivation of nominal and real wage rigidity, cf. Grubb, Jackman and Layard (1983), Coe (1985).

quence of inadequate wage adjustment to a real shock. It depends on the elasticity of wage development with regard to deviations of unemployment from its long-term equilibrium ( $\alpha_3$ ). The more slowly wage policy reacts to changes in the unemployment rate, the higher real wage rigidity and - mirrored against this - the lower the real wage flexibility will be. Analogous to this, nominal wage rigidity describes the extent of the increase in the unemployment rate that occurs during the course of adjustment to nominal shocks. For a given reaction of wage growth to deviations in the unemployment rate away from its long-term equilibrium value, nominal wage rigidity is more modest the faster changes in the inflation rate affect wage development ( $\alpha_1$ ).

The broad variation of inflation and unemployment in the various European countries points to marked differences in Europe's wage policy orientations. However, the convergence of the rates of wage and price increases currently discernible in Europe does not necessarily have to be attributed to a convergence of real and nominal wage rigidities; it can simply be due to the pressure of different levels of unemployment. True convergence of wage policy, with the same real and nominal wage rigidities, is evident primarily from the fact that the development of unit labour costs in the individual countries would demonstrate a similar development even with falling and, ultimately, also with equally high unemployment rates. If no convergence of labour market flexibility were to result, the individual countries would be able to demonstrate similar low wage increases, but this would be accompanied by unchanging and extremely divergent unemployment rates, if these were not compensated for by comprehensive migratory movements.<sup>8</sup> This would not negatively affect the stability of a single currency in Europe but would undoubtedly have political repercussions, not least in a scenario in which unemployment rates continued to diverge following a negative supply or demand shock. Therefore, the necessary condition for a true alignment of wage formation is the convergence of both unit labour cost and unemployment rate trends. In the following section, the extent to which differences in wage formation between the EMU applicants were evident in the past will be examined, as well as the question whether an alignment is noticeable in the run-up to EMU.

## 2.2 Empirical Results

The aim of the empirical analysis is to examine, using equation (6), whether there were any differences in wage formation in the individual countries, whether discernible differences remained stable over time, or whether there were structural breaks in the run-up to EMU that could point to a convergence or, indeed, a divergence of the coefficients. Of particular significance are the results with regard to the influence of productivity and unemployment rates. Thus the productivity orientation is a necessary condition for a successful monetary union, in order to satisfy the restrictions of a single currency area. Such a policy is reflected in a cointegration of wages, prices and productivity and in the wage function by a productivity coefficient of approximately one. However, if the influence of productivity is not significant, or if the coefficient is very small (near zero), the income available for distribution in this economy plays no role, or only a minor one, in wage formation. If the price coefficient in the error correction term equals one, wage formation tends towards a constant growth of real wages. If the productivity coefficient is also equal to one, an adjustment towards a long-term constant labour share is the result. Deviations from this long-term value are reduced by a certain percentage in each period ( $\lambda_i$ ). The coefficient ( $\lambda_i$ ) therefore represents the speed of adjustment of wage formation following a deviation away from its long-term equilibrium.

Before estimating the wage equation, we tested for cointegration of the variables specified in the error correction term of (6). The results are summarised in table 3. According to a Johansen test „no cointegration“ was rejected in Germany, Austria, the Netherlands, Belgium, the United Kingdom, Italy, Portugal and Sweden at a 1% level of significance and in France at a 5% level of significance. In Spain, the Johansen test does not indicate any cointegration between wages, prices and productivity. However, a two-stage augmented Dickey-Fuller test on cointegration of wages, prices and productivity does not confirm this result for all countries. The residuals of the cointegrating equation in the upper panel of

<sup>8</sup> Because of cultural, linguistic, societal, and linguistic differences, the cost of migration in Europe will remain high even after monetary union, and comprehensive migratory movements are therefore not expected. In the further course of this analysis, they are therefore not considered as an option for balancing the labour market.

table 3 are stationary in Germany, Austria, the Netherlands, Belgium and Sweden, indicating the existence of a cointegrating equation. In France, the United Kingdom, Portugal and Spain the test rejects cointegration even at the 5%, while in Italy it is not rejected at the 5% significance level. It seems to be that especially in those countries with a wage bargaining system with elements of central negotiations and a higher degree of macroeconomic co-ordination, the determinants of wage growth are prices *and* productivity, which characterises a productivity-oriented wage policy.

These findings correspond to those of the estimates of the wage equation which have been summarised in table 4. To account for contemporaneous correlation in the errors across equations we have estimated the wage equations as a system of seemingly unrelated regressions. Such a specification has the advantage of allowing for cross-equation restrictions on parameters. In spite of the strong interdependence between wages and prices we have not estimated wage and price equations simultaneously. The coefficient of the price variable in the wage equation therefore reflects only the correlation between wages and prices. It should not be interpreted as an indicator for nominal rigidities.

It is typical that - with the exception of Italy - only the hard-currency countries of Germany, Austria, the Netherlands, and Belgium demonstrate a significant long-term influence of productivity. In Germany, the Netherlands and Belgium, moreover, the coefficient is not significantly different from one. In Austria, on the other hand, the coefficient stands at 0.52. This means that a change in productivity growth over the longer term results in a change of only one half in wage increases. With falling growth in productivity, profits are thereby compressed but raised with increasing productivity growth, since wage policy does not follow suit accordingly. This expresses itself in fluctuations of the labour share over a longer time period. Surprisingly, in Italy wages, prices and productivity are cointegrated according to both tests and the coefficient of the long run effect of productivity on wages is not significantly different from one, which would imply a productivity-oriented wage policy as in the hard currency countries. However, the inflation performance of Italy was quite different from those countries. It seems to be that these high wage increases are not forced by an insufficient orientation towards the productivity trend but much more by the „scala mobile“, which lead to a high autonomous increase in wages. This is reflected in the relatively high constant term of the Italian wage equation.

In all other countries the coefficient of productivity in the error correction term is not significantly different from zero which indicates that in the long run, productivity is not the main indicator for wage growth. France, Portugal, Sweden and the United Kingdom were, until the mid - to late 1980s, decidedly soft-currency countries. With wage increase rates of clearly above 10%, the influence of productivity can hardly be shown econometrically, since the variance of productivity compared to the variance of wage increases is low. Although wage policy in these countries probably does not act independently of the economic situation, wage development is mainly determined by the rate of inflation. In Spain, not even wages and prices have been cointegrated in the test on cointegration as well as in the error correction estimates. The dynamics of the wage trend have therefore not been estimated using an error correction model but have been specified with a lagged dependent variable.

Table 3

### Test on Cointegration of Wages, Prices and Productivity

	DE	AU	NL	BE	FR	UK	IT	PO	SP	SW
<b>Johansen test<sup>1)</sup></b>	60.06 **	48.37 **	47.18 **	35.96 **	$\Delta w, \Delta p, \Delta q^{tr}$		51.25 **	41.40 **	28.5 -	29.20 -
<b>Cointegrating equation</b>	$\Delta w = \alpha_0 + \alpha_1 \Delta p + \alpha_2 \Delta p^{tr} + \varepsilon_1$									
$\alpha_1$	1.43	1.39	1.09	1.13	1.18	1.0	1.04	0.60	1.08	0.68
t-values	(14.1)	(11.9)	(7.8)	(8.8)	(18.8)	(13.9)	(17.4)	(3.7)	(12.4)	(3.9)
$\alpha_2$	1.1	0.51	1.05	1.81	0.84	0.22	1.29	-0.5	1.32	-0.77
t-values	(5.2)	(2.3)	(3.1)	(5.63)	(3.0)	(0.43)	(3.8)	(-1.1)	(4.9)	(-1.4)
<b>2-stage ADF Test<sup>2)</sup> on <math>\varepsilon_1</math></b>	-6.58 **	-4.4 **	-5.1 **	-4.5 **	-2.5 -	-3.73 -	-4.2 *	-2.5 -	-3.4 -	-4.4 **
<b>Johansen test<sup>1)</sup></b>	$\Delta w, \Delta p$									
	$\Delta w = \alpha_0 + \alpha_1 \Delta p + \varepsilon_2$									
$\alpha_1$	17.36      19.60      19.35      20.58      8.5      17.86									
t-values	*      *      *      **      -      *									
$\alpha_1$	1.2      0.99      0.63      1.17      0.87									
t-values	(17.2)      (14.8)      (5.2)      (11.2)      (8.2)									
<b>2-stage ADF Test<sup>2)</sup> on <math>\varepsilon_2</math></b>	-2.6      -3.74      -3.8      -2.4      -4.2									
	-      *      *      -      **									
Notes: Definition and sources of the data are listed in the notes of table 2										
**(*) denotes rejection of the hypothesis „no cointegration“ at 1% (5%) significance level										
1) Likelihood ratio test, the 1% (5%) critical value for 3 endogenous variables are 35.65 (29.88) and the 1% (5%) critical value for 2 endogenous variables is 20.04 (15.41).										
2) The 1% (5%) critical values for a regression with 2 stochastic I(1) variables are -4.30 (-3.74); the respective 1% (5%) critical values for a regression with 1 variable are -3.90 (-3.34), c.f. MacKinnon (1991).										



Table 4

**Estimated Wage Equation for Selected European Countries**  
**Seemingly unrelated Regression, 1970 to 1997**  
**Endogenous variable:  $\Delta^2 w$**

Variable	DE	AU	NL	BE
<b>constant</b>	0,02 (0,01)	0,02 (0,01)	0,03 (0,01)	0,02 (0,01)
$\Delta^2 p$	1,00*	0,42 (0,13)	0,42 (0,20)	0,80 (0,16)
$\Delta^2 \pi^{tr}$	0,26 (0,09)	-	0,37 (0,48)	0,36 (0,01)
$\Delta UR$	-	-1,05 (0,44)	-	-
<b>UR</b>	-0,29 (0,09)	-0,37 (0,12)	-0,47 (0,14)	-0,21 (0,13)
$\lambda$	0,87 (0,18)	0,80 (0,14)	0,72 (0,14)	0,80 (0,13)
$\Delta p_{-1}$	0,89 (0,17)	1,00*	0,76 (0,18)	0,89 (0,13)
$\Delta \pi^{tr}_{-1}$	0,82 (0,20)	0,54 (0,22)	0,79 (0,32)	1,24 (0,55)
<b>Shift 70 (+1)</b>	0,02 (0,007)			
<b>Shift 71 (+1)</b>	-0,015 (0,008)			
<b>Shift 74 (+1)</b>				
<b>Shift 76 (+1)</b>				
<b>Adjusted R<sup>2</sup></b>	0,83	0,61	0,37	0,67
<b>Durbin-Watson</b>	1,95	1,82	0,49	2,13
<b>Structural brake</b>	-	-	1985	-

Table 4: continued

Variable	FR	UK	IT	PO	SW	SP <sup>1)</sup>
<b>constant</b>	0,03 (0,01)	0,07 (0,01)	0,06 (0,02)	0,06 (0,02)	0,04 (0,02)	0,02 (0,01)
$\Delta^2 p$	1,38 (0,12)	1,00	0,56 (0,08)	0,31 (0,09)	0,73 (0,16)	0,65 (0,13)
$\Delta^2 \pi^{tr}$	-	0,23 (0,13)	-	-	-	1,56 (0,56)
$\Delta UR$	-	-	-0,98 (0,33)	-	-	-1,18 (0,21)
<b>UR</b>	-0,19 (0,07)	-0,21 (0,10)	-0,56 (0,16)	-0,89 (0,27)	-0,26 (0,21)	-0,07 (0,05)
$\lambda$	0,66 (0,16)	0,71 (0,14)	0,87 (0,12)	0,35 (0,12)	0,82 (0,17)	0,44 (0,11)
$\Delta p_{-1}$	0,98 (0,07)	0,83 (0,1)	0,78 (0,06)	1,0*	0,65 (0,21)	
$\Delta \pi^{tr}_{-1}$	-	-	0,97 (0,32)	-	-	
<b>Shift 70 (+1)</b>						
<b>Shift 71 (+1)</b>						
<b>Shift 74 (+1)</b>				0,12 (0,02)		
<b>Shift 76 (+1)</b>				-0,09 (0,02)		
<b>Adjusted R<sup>2</sup></b>	0,76	0,85	0,85	0,83	0,54	0,54
<b>Durbin-Watson</b>	2,21	1,91	2,32	1,91	1,91	2,12
<b>Structural brake</b>	-	1988	-	1979	-	-

Notes: Definition and sources of the data are listed in the notes of table 2. All variables except UR and  $\Delta UR$  are in logs.  $\Delta$  denotes first and  $\Delta^2$  denotes second differences. Shift denotes dummy variables. Standard errors in brackets.  
\* Coefficient has been restricted to 1. Coefficients with t-values less than 1 have been restricted to 0. Likelihood ratio tests indicate the improvement of the regressions.  
1) Because  $\Delta w$ ,  $\Delta p$  and  $\Delta \pi^{tr}$  are not cointegrated, the wage equation for Spain has been estimated according to a distributed lag model.  $\lambda$  refers therefore to the lagged endogenous variable.

Just as with the productivity orientation of wage policy, there are also clear differences between the countries regarding the influence of the unemployment rate on the wage trend. The unemployment rate coefficient can - as derived above - be interpreted as an indicator for real wage rigidities on the labour market. If the unemployment rate coefficients are different across countries and if no convergence can be discerned, there is the danger that regional unemployment rates will continue to diverge following the introduction of the monetary union.

In most countries, unemployment demonstrates a significant negative influence on wage development. However, there is no clear evidence for hysteresis in wage determination in Europe. In some countries like Austria and Italy, wage policy reacts to changes and differing levels in the unemployment rate. In both countries, the coefficient of changes in the unemployment rate is approximately one and the coefficient of the level is significantly different from zero, hence we have persistence in wage bargaining in these countries. In contrast, it seems to be that wage determination in Spain is characterised by pure

hysteresis. Only changes in unemployment are significant. In all other countries, changes in the unemployment rate have no significant effect on wage dynamics. This indicates a pure Phillips curve relationship with a stronger responsiveness of wage settlements to the level of unemployment. In this group, Portugal shows the most pronounced reactions.<sup>9</sup> A one-percent increase in the unemployment rate led to a fall in the rate of wage increases by roughly 0.9 percentage points within the same year.

Portugal occupies a remarkable special position in the process of convergence in Europe, especially when compared with Spain. Both countries share a large number of similarities, not only regarding the political and social climate, but also their economic conditions. However, there are two very pronounced differences as regards the development of inflation and unemployment rates. While Spain's unemployment rate was the highest in Europe in 1997, this never exceeded nine percent in Portugal. This contrary development cannot be explained by structural factors.<sup>10</sup> Both the institutional organisation of the labour market as well as the density of institutional regulations are virtually identical in both countries. The two major differences between the two countries are the extent of their respective unemployment benefits (although more markedly so in the past than at present) and the intensity of macro-economic co-ordination (which is slightly more intensive in Portugal).<sup>11</sup> The development of inflation rates also varied dramatically. Following a strong rise in inflation rates in the mid-1970s, a policy of stabilisation set in in Spain in 1977. However, import prices were again on the rise by the early 1980s. The necessary drop of the previously strong increase in the wage rate was accompanied by renewed price increases from the oil exporting countries, a development for which the Spanish unions were not fully prepared. Only when a restrictive monetary policy led to an ever-stronger reaction of employment did a delayed slow-down of wage increases occur. In Portugal on the other hand, inflation was brought down later - and at the same time as a drop in oil prices. The restrictive monetary course was much more effective here, since Portuguese wage policy reacted much more quickly to the increase in unemployment with lower wage agreements. This could also be put down to the Portuguese government's greater efforts to co-ordinate its economic policy. In 1984, a tripartite committee was introduced by decree, and hand in hand with this development, consultation and co-operation between the wage negotiation parties increased at the national level. By means of this policy mix, Portugal was able to effect the clear reduction of inflation rates without a drastic increase in unemployment within a relatively short space of time.

By contrast to Portugal, the influence of the level of the unemployment rate is much lower in most countries. The Netherlands with a coefficient of 0.5, are one exception, while in Italy with a similar coefficient of the level of unemployment, persistence occurs. The weakest impact of unemployment on the wage dynamics can be found in Belgium, France, the United Kingdom and Sweden. Additionally in Sweden the unemployment rate is significantly different from zero. Hence, Sweden is the only country where neither changes nor the level of the unemployment rate have an impact on wages. The Swedish economy was, for a long time, characterised by apparent full employment, with the government trying to pursue an active labour market policy by expanding employment in the public sector. In this scenario, the unemployment rate had virtually lost its function as an indicator of labour market imbalances. Thus, rising unemployment was almost indiscernible in Sweden for long periods of time, and wage policy did not have to - or could not - react to it. By pursuing a labour market policy that encouraged employment creation in the public sector, the labour market was always cleared, which meant that, following the onset of an economic upturn, an insufficient work force was available to the private sector. Increasing labour demand then led immediately to a halt in wage increases. This type of active labour market policy experienced a clear trend reversal only in 1992, at which point Swedish unemployment rose markedly. In the econometric estimates, which take into account a long observation period to determine the coefficients, this structural break did not, however, lead to a significant change in coefficients.

Differences regarding the correlation of wages and prices, the influence of unemployment rates, the speed of adjustment and the long run elasticity with respect to productivity are noticeable across countries. According to a Wald test on coefficient restrictions (table 5) the hypothesis that the correlation between wages and prices are equal in countries under consideration can clearly be rejected. However,

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<sup>9</sup> The results for Portugal correspond to the estimate results by Luz,Pinheiro (1994), cited from Blanchard and Jimeno (1995).

<sup>10</sup> Cf. Blanchard, Jimeno (1995).

<sup>11</sup> *ibid.*

regarding the elasticity with respect to unemployment and to productivity striking differences occur between various groups of countries. As well as the tests on cointegration the Wald test detects two group of countries. In the wage equations with significant coefficients of productivity in the error correction term, these coefficients are not significantly different from each other. Even the restriction to one can not be rejected. The same difference between these groups occur with respect to unemployment and to the speed of adjustment. The hypothesis that none of the unemployment rate coefficients/error correction terms differ significantly from each other is clearly rejected for Germany, Austria, the Netherlands and Belgium, while the restriction of equal coefficients does not hold for all countries.

Of particular interest for a successful monetary union is the necessary convergence of the wage determination process in the countries participating in that monetary union. This entails in particular a more or less complete productivity orientation and similar nominal or real wage rigidities. The estimated results described above, however, show some substantial differences between the different countries. It is therefore necessary to examine whether there have been structural breaks during the 1980s and 1990s that would point to a convergence of wage policy in Europe. Breakpoint tests were carried out by means of recursive residuals of OLS regressions of the wage equations (CUSUM- and CUSUM-square tests). These tests show a significant structural break for only few countries, among them Portugal and the United Kingdom, who, based on their findings, experienced breakpoints in 1988. However, according to the Chow Test, these were only of very minor significance. The situation was different in the Netherlands, however. Here the CUSUM-square test pointed to a structural break in 1985 that was confirmed by the Chow Test. A further test using recursive estimates shows that the structural break can be attributed to changes in virtually all coefficients. The short-term effects of the inflation rate tendentially diminish, while those of productivity, on the other hand, increase. Furthermore, the wage dampening influence of the unemployment rate increases. In all of the other countries, by contrast, the estimated relationships over time remain more or less stable.

In Italy, where the probably most visible changes in Europe in terms wage policy direction occurred with the abolition of the "scale mobile" in 1993, no structural break was evident. This is surprising, especially since the Italian government has increasingly intervened in wage bargaining negotiations during the 1990s to co-ordinate wage trends with its economic and social policy targets. However, this can also be attributed to the fact that those values which are available for the period when institutional regulations were changed until 1997, the end of the estimate period, are insufficient to reveal a significant structural break. Estimates using recursive residuals, by contrast, show clear changes in the coefficients. Thus the influence of the unemployment rate has increased markedly since 1993. Even if no significant structural break can be shown at present, Italy is demonstrating a change in its wage determination process.

To conclude, according to our results two groups of European economies can be distinguished. In countries like Germany, Austria, the Netherlands and Belgium where the systems of wage determination are quite similar, wages are formed according to common rules, regarding the productivity orientation of wage policy, the real wage rigidity and the speed of adjustment to deviation of the labour share from the equilibrium level<sup>12</sup>. Additionally, it can be said that there were significant differences in wage determination compared to the other countries under consideration and that these differences have not decreased significantly in the late 1980s and the 1990s. Although the unemployment rate had a dampening effect on wage policy in most countries, the degree of reaction to it differed widely. Even more significant

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<sup>12</sup> This result is in contrast to the findings of Fitzenberger, Franz (1994) and Fitzenberger (1995). The main focus of attention in their studies was on identifying macro-economic or sectoral factors influencing wage formation for a series of countries applying to join EMU (Germany, Denmark, the Netherlands, Belgium, France, the United Kingdom, and Italy).. In centralised wage negotiations, aggregate variables, and, in decentralised negotiations, sectoral variables could be significant for wage formation. In both studies, however, no differences could be discerned between the countries examined with regard to this formulation of questioning. On the whole, the countries chosen are economies in which wage formation is carried out formally at the sectoral level, and of which only the United Kingdom can be considered an "extreme case" in terms of wage formation (cf. Table 1). The similarity of the results can therefore possibly be put down to the small degree of variance between the chosen countries with regard to the level of wage bargaining. In addition, no tests were carried out on significant differences in coefficients cf. Burda (1994).

differences were discernible in the long-term productivity orientation and the reaction to changing rates in price increases.

Table 5

<b>Wald Test on Coefficient Restrictions</b>			
Estimated Equation: $\Delta^2 w_i = \alpha_{1,i} + \alpha_{2,i} \Delta^2 p_i + \alpha_{3,i} \Delta^2 p_i^{fr} + \alpha_{4,i} \Delta UR_i + \alpha_{5,i} UR_i - \lambda_i (\Delta w_{i-1,i} - \beta_{2,i} \Delta p_{-1,i} - \beta_{3,i} \Delta p_{-1,i}^{fr})$ for $i = DE, AU, NL, BE, FR, UK, IT, PO, SW, SP$ Estimation Method: Seemingly Unrelated Regression			
<b>Null hypothesis:</b>	$\chi^2$ - statistic	significance level	rejection of $H_0$
<i>Short run price elasticity:</i>			
$\alpha_{2,DE} = \alpha_{2,AU} = \alpha_{2,NL}$	20,69	0,000	**
$\alpha_{2,DE} = \alpha_{2,AU} = \alpha_{2,NL} = \alpha_{2,BE}$	29,72	0,000	**
$\alpha_{2,DE} = \alpha_{2,AU} = \alpha_{2,NL} = \alpha_{2,BE} =$			
$\alpha_{2,FR} = \alpha_{2,UK} = \alpha_{2,IT} = \alpha_{2,SW} = \alpha_{2,SP}$	155,47	0,000	**
<i>Elasticity with respect to unemployment</i>			
$\alpha_{5,DE} = \alpha_{5,AU} = \alpha_{5,NL}$	1,20	0,548	
$\alpha_{5,DE} = \alpha_{5,AU} = \alpha_{5,NL} = \alpha_{5,BE}$	2,03	0,565	
$\alpha_{5,DE} = \alpha_{5,AU} = \alpha_{5,NL} = \alpha_{5,BE} = \alpha_{5,FR} = \alpha_{5,UK} = \alpha_{5,IT} = \alpha_{5,SW} = \alpha_{5,SP}$	26,06	0,001	**
<i>Error correction term:</i>			
$\lambda_{DE} = \lambda_{AU} = \lambda_{NL}$	0,51	0,776	
$\lambda_{DE} = \lambda_{AU} = \lambda_{NL} = \lambda_{BE}$	0,51	0,917	
$\lambda_{DE} = \lambda_{AU} = \lambda_{NL} = \lambda_{BE} =$			
$\lambda_{FR} = \lambda_{UK} = \lambda_{IT} = \lambda_{PO} = \lambda_{SW} = \lambda_{SP}$	99,20	0,000	**
<i>Long run elasticity with respect to productivity</i>			
$\beta_{3,DE} = \beta_{3,AU} = \beta_{3,NL}$	0,97	0,613	
$\beta_{3,DE} = \beta_{3,AU} = \beta_{3,NL} = \beta_{3,BE}$	2,10	0,552	
Notes: The tests are based on the results listed in table 4. Definition and sources of the data are listed in the notes of table 2. **(*) denotes rejection of $H_0$ at 1% (5%) significance level.			

### 3 Conclusions

For a specific formulation of questioning regarding labour market conditions for successful monetary union, the correlation between the degree of centralisation and labour market flexibility in the participating countries is particularly important. Austria, Germany, the Netherlands, Belgium, and Portugal were especially successful in combating unemployment and inflation between 1970 and 1996. Furthermore, the exchange rate relations between the hard-currency countries were more or less constant. These are also countries, which, according to the econometric estimates, show a pronounced productivity orientation and a relatively strong reaction with regard to unemployment rates. This is compatible with the fact that wage policy in these countries demonstrates similar structures. Germany, Belgium, Austria, and the Netherlands are countries with formal or informal wage policy co-ordination. Tripartite discussions at the national level have also played an important role in Portugal since the early 1980s. In France,

Italy, and Spain, on the other hand, wage negotiations moved in a different direction for a long time. All three countries were – or still are – shaped by directional unions in the 1980s and wage bargaining parties demonstrated fragmented structures. While there is no indication of fundamental change occurring in France and Spain, the Italian wage formation system has shown a definite trend reversal, geared towards a greater concentration in wage negotiations. However, an economy's economic success cannot be connected monocausally with the degree of centralisation. For a very long time, Sweden, for example, demonstrated a very low unemployment rate despite highly centralised elements, and yet the wage increases agreed by the wage bargaining parties were not met by productivity, so that increases in both unit wage costs and inflation were high. The Swedish central bank accepted these high inflation rates for a long time, and employment expansion in the public sector helped to mask unemployment. Wage policy was therefore not given any clear signals with respect to price stability. Unemployment only began to rise in the course of price stabilisation in the run-up to EMU and the consolidation of public budgets.

All in all, the common interpretation of empirical findings, econometric tests, and analyses of wage formation institutions points that the convergence of inflation rates to the German level could be achieved only at the expense of a clear rise in unemployment. These results show, for one thing, that the convergence of inflation rates should not hide the fact that wage policy in Europe is still very heterogeneous, which implies a continuation of regional differences in unemployment rates following the introduction of monetary union.

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