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EURO: HOW MUCH FLEXIBILITY
DO WE REALLY NEED?**

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***INTERNATIONAL MACROECONOMICS AND
LABOUR ECONOMICS***



Centre for Economic Policy Research

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ABSTRACT

European Labour Markets and the Euro: How Much Flexibility Do We Really Need?*

Widespread concern over real effects of EMU is consistent with new Keynesian approaches to macroeconomic fluctuations, but more difficult to reconcile with a real business cycle (RBC) paradigm. Using a model with frictions as a point of departure, I speculate that nominal price rigidity in Europe is likely to increase, while real rigidities are likely to decrease, as a consequence of monetary union. This logic implies a new European macroeconomic regime in which monetary policy is increasingly 'effective' in influencing output in the short run. Similarly, changes in the nature of real and nominal price determination are likely to increase the volatility of the European business cycle. Empirical evidence of increasing co-variation of price inflation and declining correlation of wage inflation and real-wage growth within EMU countries in the last decade is consistent with this conjecture. Calls for additional labour market flexibility, given the magnitude of what is already in store for Europe, may be unwarranted.

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NON-TECHNICAL SUMMARY

In addition to evidence on the workings of monetary unions and the nature and source of regional fluctuations, European Monetary Union (EMU) will provide economists with valuable insights into the monetary transmission mechanism and the relevance of the new Keynesian approach to macroeconomics. Given current skepticism regarding monetary policy, concern over real effects of EMU comes as a surprise; in a world of flexible prices, complete contingent claims markets and perfect information, it is difficult to see why monetary union should matter at all for real integration. Yet the liveliness of the contemporary debate suggests that, for whatever reasons, real effects of EMU *are* on the cards. If this is indeed the case, the underlying presumption must be that aggregate demand and the money supply in particular can influence the short-run path of output and employment and will continue to do so after the EMU is up and running, possibly in a different way from the present. Using models with nominal and real frictions as a point of departure, I speculate about the future of the monetary transmission mechanism with a view to the real effects of monetary union.

A general thesis of the Paper is that looking to the past is a bad way to think about the future of the EMU. The Lucas Critique applies in full force: a new regime will change incentives and behavioural patterns in a number of ways which will affect the monetary transmission mechanism, or at least the way we teach it to undergraduates. Judging from the past (e.g. from estimates of shocks and propagation mechanisms from structural vector autoregressions) is likely to be a poor guide to what will happen in the future. For example, much has been made about the appropriateness of Europe as an optimal currency area in the sense of Mundell and others who followed him and it is widely recognized that the success of a monetary union is conditioned on high correlation of economic fortunes, or barring that, a high degree of factor mobility. European labour immobility, which reflects preferences and demography as well as institutional rigidities, has been well documented and belongs to the accepted truths of a European currency area. Yet this is only part of the picture: capital mobility and product market integration, which represents the implicit mobility of both factors via trade, are much more likely to determine whether Mundell's conditions for a currency area are met. Capital mobility will be enhanced by the depth of new common debt and equity markets, enabling mergers and acquisitions previously possible only in the US. Product market integration will force product price and factor price convergence for labour of similar quality.

Furthermore, the real rigidities in labour markets, which prevent adjustment, will come under increasing pressure from integration. The well known Hicks-Marshall-Rule of labour demand implies that integration of product and factor markets will increase the elasticity of demand for labour at any given level (local, regional or national), subjecting labour market rigidities to increasing pressure, especially those related to collective bargaining. For a number of reasons, there is little reason to believe that European unions are in a position to 'pan-Europeanize' collective bargaining structures. The potential for coordinated bargaining strategies is presently incompatible with union structures across countries, but is essential to purposeful pattern bargaining. Moreover, it seems highly implausible that Europeans will accept wage leadership of German engineering and public sector workers after having finally shaken themselves from the yoke of Teutonic monetary policy! The breakaway behaviour of the Netherlands, Denmark, Ireland and Portugal support the hypothesis that EMU is a Trojan horse of decentralization: not only *de facto*, but more importantly, for structural reasons related to product and capital market integration.

Less attention has been paid to the impact of monetary union on the transmission mechanism, i.e. the way monetary policy works. To the extent that EMU also affects the degree of nominal rigidity in the economy, it will affect the monetary transmission mechanism. Taking a new Keynesian perspective, I argue that nominal price rigidity in Europe is likely to increase for three reasons. First, the introduction of a common currency will move a large share of industry into the 'home goods' sector which is sheltered from the vagaries of nominal exchange rate and international demand fluctuations, limiting cost pressures to domestic (Euroland) labour markets and marginalizing the importance of exchange rate changes for pricing decisions. Second, in contrast to the usual thinking, EMU implies a significant *decrease* in the overall relevance of the competitive external market for the representative producer and an enlarged domestic market with *more* pricing power on balance. This increase in local market power is more likely as the pace of mergers and acquisitions within Euroland accelerates. To the extent that 'inwardization' increases monopolistic power in price setting, it increases incentives not to adjust domestic currency nominal prices. The third and potentially most important effect derives from the perceived credibility of a central bank to stand above (i.e. ignore) economic conditions in individual countries. To this extent, if the ECB is really the most independent central bank in the world, agents will expect low inflation and will not attribute short-term fluctuations in inflation to policy changes. This important source of inertia should be distinguished from the usual wage-price mechanism; rather it has to do with the anchoring of inflationary expectations and the effect this has on the willingness to negotiate contracts in nominal terms.

In short, using the old-fashioned terminology of undergraduate macro, there are many reasons to think that the European short-run aggregate supply curve will be flatter post-EMU. The indirect evidence presented in the Paper documents a convergence of exchange rate and especially price dynamics, suggesting that the preconditions for nominal price rigidities have become more favourable in Euroland. At the same time, national patterns of nominal and real wage developments are becoming increasingly desynchronized. I conclude that the macroeconomics of Europe will change fundamentally post-EMU; monetary policy should gain a new potency, as Europe begins to look more like the US and Japan and less like Germany and France. While a new role for monetary policy emerges, the usual caveat applies that the effectiveness of monetary policy is to a large extent an artifact of its *not* being used in a predictable way to inflate the economy (Taylor 1980). Rather than an endorsement of 'domestic demand management', the message of this Paper should be construed as a warning that the temptation to employ such a strategy could increase in future years.

I. Introduction

In addition to evidence on the nature and source of regional fluctuations, European Monetary Union (EMU) will also provide economists with valuable new evidence on the monetary transmission mechanism. Given the skepticism with which macroeconomics currently regards monetary policy, current concern over real effects of EMU comes as a surprise; in a world of flexible prices, space-spanning contingent claims markets and complete information, it is difficult to see why monetary union matters at all for real integration processes already underway.¹ For example, if the real business cycle paradigm (RBC) – which emphasizes disturbances and propagation mechanisms in the nonmonetary economy and ignores nominal rigidities – is approximately correct, the EMU exercise is nothing but a sophisticated veil. To the extent that EMU leaves fiscal policies and real behavioral incentives unchanged, the effects of a common currency are of second order at best. In short, this paper has no real reason to be written.

Yet, the liveliness of the contemporary debate – among reasonable and cool-headed economists for the most part – is suggestive of an expectation that, for whatever reasons, real effects of EMU *are* in the cards. If this is indeed the case, the underlying presumption must be that nominal disturbances to aggregate demand and the money supply in particular can influence the short-run path of output and employment, and will continue to do so after the EMU is up and running. Not wanting to make my life too easy, I have decided to write this paper from the perspective of an eclectic who is willing to entertain new-Keynesian arguments. These arguments are important, as the survival of monetary union will rest on factors outlined long ago by Mundell (1961) and McKinnon (1963). In Europe, these are perceived to originate chiefly in labor markets. From a point of departure that money and

¹ The view that short-run adjustment costs associated with EMU are small relative to long-run gains has been echoed recently by Buiter (1995).

monetary policy can influence real variables, I will discuss the macroeconomic impact of labor market rigidities on real and nominal adjustment to disturbances in Euroland. However, the most interesting aspects involve taking the discussion one step further: for a number of reasons, the arrival of EMU will itself have significant effects on the functioning of labor and product markets and the relative importance of real and nominal rigidities. These feedbacks will ultimately affect the way Europe reacts as a macroeconomic entity to demand disturbances and how its central bank views the effectiveness of monetary policy.

This paper surveys a number of issues too involved to be treated in model-theoretic detail here. I will furthermore abstain from econometric analyses for reasons which should be clear to all. There is a sense that the macroeconomic regime has changed in a way it has not in several hundred years in Europe: if the Lucas Critique has any relevance at all, it had better be here and now. I will adduce some empirical evidence however, which is suggestive of what one might expect in the future. The paper is highly speculative, but meant to be so.

My discussion is organized as follows. In Section II, I address discuss the macroeconomic impact – at both regional and pan-European level – of the current structure of labor markets. Second, I survey the multifarious means by which a monetary union could affect the functioning of labor markets. This feedback takes some surprising turns, and may lead to a wholly different perception of the transmission channels of monetary policy in Europe. Section III adduces simple but striking evidence in support of my hypotheses and Section IV concludes.

II. How will Labor Market Inflexibility affect the Macroeconomics of Euroland?

II.1 Real Rigidities and Regional Fluctuations

Robert Mundell taught us long ago that the key to a monetary union's success can be found in the synchronization of underlying economic fortunes and, barring this, the mobility

of factors of production, especially that of labor.² Naturally, labor mobility is costly for both natural and man-made reasons, and *immobility* may be regarded differently across cultures and traditions. Abstracting from social valuations of immobility, losses of output and welfare are involved when labor does not move to job opportunities, in a geographic, industrial or occupational sense. To the extent that regional shocks – such as an oil discovery in the North Sea or German unification – continue to occur, they will wreak macroeconomic havoc on the real evolution of output, employment and other important variables in ways which are now well-understood. The lack of a flexible nominal exchange rate in a world of nominal rigidities may imply protracted adjustment to regional shocks, unless labor and other resources move to follow better economic fortunes.

Indeed, the available evidence on labor mobility in the European context is remarkably discouraging and suggests that a major component of rigidity derives from labor's unwillingness to move.³ In addition, Europe is characterized by less in-migration, lower fertility and older demographic structure; all these factors further tend to increase immobility. It would almost seem unfair to compare Europe with the United States, given that the gene pool of the latter constitute a selection of those of the former who had the strongest incentives to migrate! At the same time, it is worth noting that even *within* national boundaries, European labor mobility is low and not capable of erasing regional disparities, so it is unrealistic to expect much here.⁴

Yet factor mobility in a monetary union is not restricted to labor, and under conditions of constant returns one should be indifferent whether the capital migrates to labor or labor

² See Mundell (1961), as well as McKinnon (1963) and Kenen (1969).

³ Indirect estimates of labor mobility for the United States by Blanchard and Katz (1992) and for Europe by Decressin and Fatas (1995) show that European regions tend to adjust to adverse employment shocks via changes in labor force participation as opposed to residence. For more detailed summaries of the evidence see Eichengreen (1993) and Gros and Hefeker (1998) as well as Obstfeld and Peri (1998).

⁴ See Gros and Hefeker (1998) for an overview.

migrates to capital.⁵ In theory, EMU will liberate capital mobility as exchange rate risk vanishes, and in fact intra-European capital mobility has surged in recent years. This is documented in Table 1, which shows the evolution of intra-EU foreign direct investment (FDI) flows since the 1980. The persistent boom in European equities can be seen in part as a reaction to the increased mobility now afforded to capital by a common currency and increasingly integrated asset markets, combined with efficiencies offered by a unified market for goods and services. Whether mobile capital can smooth out fluctuations is not well-understood; it stands to reason, however, that capital should move to places where labor is in excess supply and could in principle perform this function.

Product market integration is potentially more important than either form of factor mobility. Heckscher-Ohlin trade theory under incomplete specialization implies that harmonized product prices in traded output produced with the same technology leads to wage convergence (the factor price equalization theorem). Consequently the need for factor mobility is eliminated and the market spreads shocks automatically across the currency area. Here evidence by von Hagen and Neumann (1994), Fatas (1997), Frankel and Rose (1996), Bayoumi and Eichengreen (1993, 1996) and others seems to point to increasing product market integration over time, although this literature has tended to emphasize quantities more than prices.

**<Table 1: Intra-EU Foreign Direct Investment
Flows, 1985-1994 (% of GDP)>**

II.2 Nominal Frictions, Real Rigidities and pan-European Macroeconomic Fluctuations

The next point of discussion is the role of nominal frictions in the European context. What could the sources of non-neutralities of money in a future EMU be? Arguing from the status

⁵ It is remarkable that the optimal currency literature has largely ignored the role of capital mobility – meaning long run mobility of the means of production – despite Mundell's own explicit reference to it in his seminal article. For examples, see discussions in Bofinger (1994), Bayoumi and Eichengreen (1996), Wyplosz (1997), or Gros and Hefeker (1998).

quo, the common perception is that nominal rigidities play a subordinate role in European business cycles. The standard assumption is that the large role of centralized collective bargaining, the use of indexation, and a high degree of openness all made Europe more likely to translate demand disturbances rapidly into inflation than the United States, Canada, or Japan. A thorough if somewhat dated discussion of these issues can be found in the work of the late Michael Bruno and Jeffrey Sachs,⁶ who distinguished between US and continental European labor markets by their reaction to nominal demand and supply shocks. For them, the structure of labor markets – meaning to a large extent institutions of wage determination – was a key determinant of adjustment to macroeconomic and especially supply side disturbances.

As this paper's role at a conference on the monetary transmission mechanism suggests, the functioning of the labor market will be central to understanding the effects of EMU.⁷ Mainstream macroeconomics predicts real effects of money and nominal demand fluctuations when impediments prevent the clearing of product and especially labor markets. While the origin of these impediments are still poorly understood, it is also clear that the role of rigidities in nominal and real spheres are highly complementary for any neoclassical or "new Keynesian" account of macroeconomic fluctuations (e.g., Blanchard (1990), Ball and Romer (1990), Romer (1996), Jeanne (1998), Röger (1998), Kollmann (1999)). This means that it is not sufficient for nominal rigidities (such as menu costs) to exist, but they must also exist alongside real rigidities. In one widely-cited mechanism, *coordination failures* prevent agents from moving the economy to a better equilibrium.

This complementarity lends intuition to Milton Friedman's (1953) argument for floating exchange rates. In a famous analogy, Friedman compared the gains from flexible rates to those

⁶ See Bruno and Sachs (1985), Sachs (1979, 1983), but also Branson and Rotemberg (1980).

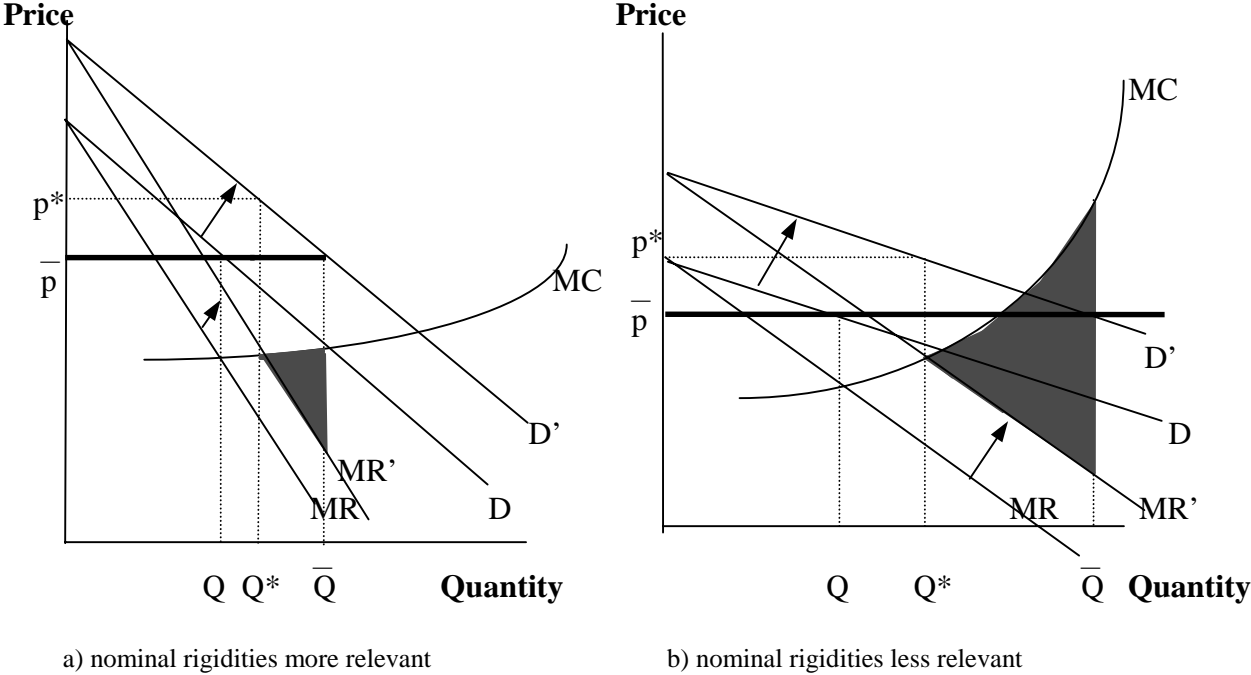
from setting all clocks back one hour in the fall and forward in the spring: it is more efficient to change the nominal time standard (the nominal exchange rate) than it is to require millions of individuals to adjust their daily time schedules (nominal domestic prices) to the annual solar cycle (changing demand and supply conditions).⁸ Blanchard (1990:810ff.) and especially Romer (1996:283) make the reasoning more explicit: individuals do not change their nominal schedules in the absence of daylight savings time because of the real costs they incur, given that all others do not change their behavior.

We are dealing with firms which set prices. The extent of real rigidities for a given price change can be thought of as the resource cost to firms of not moving to optimal pricing *in the absence of nominal frictions*. In the two panels of Figure 1, this is given by the shaded areas, which are approximately triangles with base $\bar{Q}-Q^*$ (equal to the output difference between passive quantity adjustment at rigid price \bar{p} given by \bar{Q} and the profit-maximizing output level given by Q^*), and height equal to the gap between marginal cost (MC) and marginal revenue (MR) at output level \bar{Q} . The latter depends on various factors such as the behavior of the marginal product of labor, marginal capacity costs, and the elasticity of labor supply. In the first panel, the costs of *not* changing price from \bar{p} to p^* are relatively small, since the desired quantity change is modest and marginal costs are flat.

⁷ Among others, Romer (1996) has stressed the labor market as a primary source of real rigidities in the macroeconomy, as complementary to nominal rigidities.

⁸ "The argument for flexible exchange rates is, strange to say, very nearly identical with the argument for daylight savings time. Isn't it absurd to change the clock in summer when exactly the same result could be achieved by having each individual change his habits? All that is required is that everyone decide to come to his office an hour earlier, have lunch an hour earlier, etc. But obviously it is much simpler to change the clock that guides all than to have each individual separately change his pattern of reaction to the clock, *even though all want to do so*." (Friedman (1953), p.173, my emphasis).

Figure 1. Complementarity of Real and Nominal Rigidities for a given price change



In contrast, the firm depicted in the second panel is under considerable cost pressure to change prices, as can be seen by the vertical difference between marginal revenue and price for the last units produced. Passive quantity adjustment implies a large departure from unconstrained optimal production Q^* , while sharply rising marginal costs means that these additional units are being produced at a large loss.⁹ For a given costly nominal price adjustment, the firm in panel a) is likely to maintain rigid nominal pricing, while the firm in panel b) will adjust its prices. Comparing the two panels, one sees the necessity of real rigidities: individual firms have little incentive to change prices, given that others are not doing so. Strategic complementarity implies that second order issues for the firm can have first-order effects for the macroeconomy.

Money wage rigidity could also induce business cycle fluctuations. While an important element in the early intellectual development of Keynesian macroeconomics, nominal wage

rigidity is not borne out at the micro level (Bils 1985, Smith 1999) nor is it particularly supported by aggregate evidence on wage and price dynamics (see references in Blanchard 1990); Jeanne (1998) and Röger (1998) have both recently shown that nominal price rigidity, combined with some degree of real wage rigidity, is sufficient to generate persistent fluctuations that resemble US business cycles.¹⁰

II.3. Summary

The previous discussion can lead to rather somber conclusions about the future of EMU. First, the conventional wisdom of extreme rigidity in labor markets, which now has the OECD seal of approval (OECD 1994) and is accepted nowadays by everyone except the labor unions and perhaps a few surviving extremists in the German finance ministry, should render the EMU a Mundellian nightmare. It won't be necessary, according to this logic, for another German reunification to occur to generate real problems. All we need is some overheating in Ireland, Portugal, or Finland, and the whole EMU project will collapse as the other regions slump without any equilibrium mechanism.

An equally pessimistic message emerges on the monetary transmission mechanism when considered under these circumstances, in which a rapid pass through into inflation is taken for granted by market participants. Recent reviews by Buti and Sapir (1998) and Dohse and Krieger-Boden (1998) give rather somber pictures of the prospects, and Dornbusch et al (1998) raise questions about the asymmetric impact of monetary policy on the participating EMU countries. Moreover, fiscal policy is hamstrung by the Maastricht treaty and the Pact for Stability and Employment and potential exists for beggar-thy-neighbor effects as countries jockey to better their macroeconomic circumstances. This "Flassbeck-Lafontaine-Hypothesis"

⁹ In fact, the firm in panel b) is more likely to ration output, producing only to the point at which price equals marginal cost, and thereby violating the assumption of completely passive (i.e. demand-determined) adjustment of production to demand. In any case the point goes through that incentives to change prices in this case are large.

sees purposeful competitive deflation just around the corner, as countries unable to devalue are forced to regain competitiveness by more painful means. In this view, governments, robbed of their power to generate instant nominal devaluations will do what Britain did in the first half of the 1920s. Feldstein's (1992) criticism is now widely-accepted that politics have outweighed economics; Eichengreen (1998) has already speculated about the "dissolution" of the European Monetary Union before it even begins.

Given this doomsday scenario, critical economists are compelled to ask the question: Are rigidities in Europe set in stone? Is it reasonable to assume that the Euro will leave labor markets and their institutions intact and if not, which ones are implicated? What will be the consequences of these changes? What follows is a highly speculative discussion of three areas: 1) nominal rigidities; 2) real rigidities, holding institutions constant; and 3) changing institutions.

III. Will the Euro affect Labor Market Flexibility?

III.1. Nominal price rigidity should increase

First, I speculate that a number of factors will cause nominal rigidities to increase in Euroland, especially that of nominal prices. First, the introduction of a common currency will effectively convert a Europe of many small open economies into a behemoth with an import-export exposure of 10% of GDP, roughly as closed as the United States and Japan. This is a regime change of striking character. As a consequence, a large share of industry will be moved into the "home goods" sector, and will no longer be exposed to vagaries of nominal exchange rate and international demand fluctuations. For small, open economies with output more likely to be concentrated in the value-added chain, exchange rate disturbances are reflected rapidly

¹⁰ For evidence on the rigidity of prices in the United States see Carleton (1986); summaries of empirical evidence are available in Blanchard (1990) and Romer (1996).

in both input and output prices; a monetary union in Euroland removes this aspect, as inputs become increasingly nontraded goods invoiced in Euros. Devaluation-induced expenditure switching is no longer possible on a grand scale.¹¹ Factors favoring nominal rigidities – i.e. customer relationships, search costs, etc. – should become relatively more important than costs associated with cross-border transactions.¹² Cost pressures will increasingly be restricted to domestic (Euroland) labor markets, marginalizing the importance of exchange rate changes for pricing decisions.¹³ Figure 2 illustrates how the reaction of local currency costs to a devaluation are decisive in determining incentives to adjust prices. In the first panel, which corresponds to a small open economy, marginal costs rise in response to a devaluation and the incentive to change prices rise commensurately. In the second panel – which corresponds to Euroland – the incentive is less strong, leading to a larger output effect.

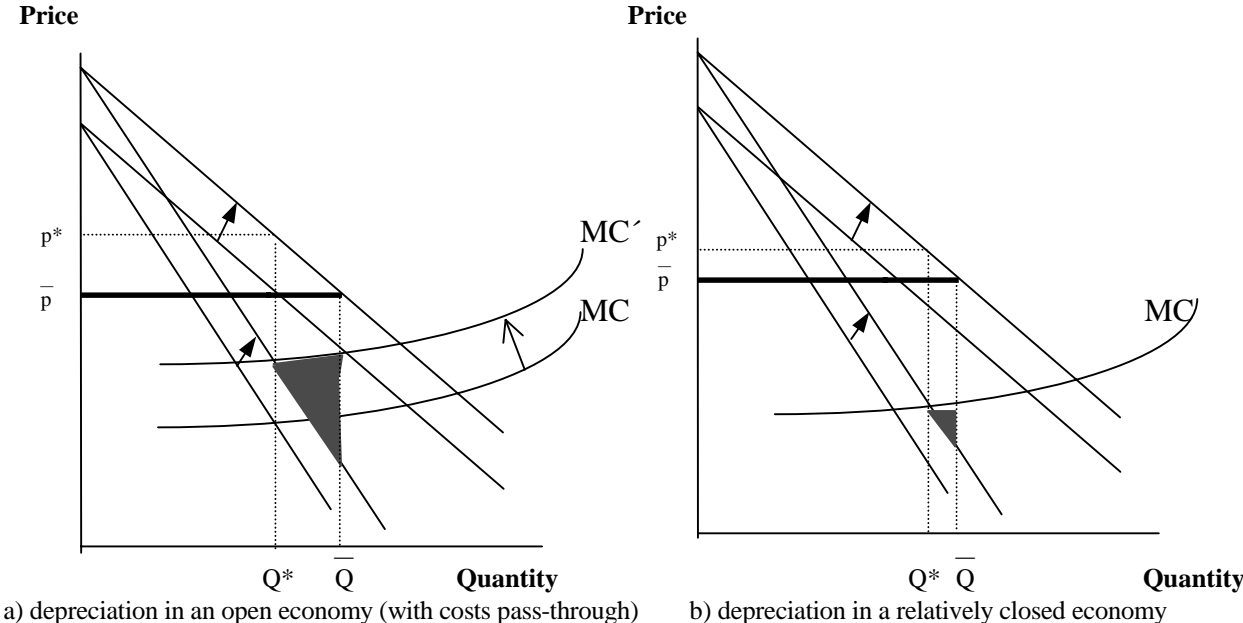
A second effect is more subtle (and possibly less relevant). A common currency area is generally assumed to *increase* competition, as improved price transparency opens up national markets to intra-EMU, cross-border rivals. At the same time, however, monetary union in Europe necessarily implies a significant *decrease* in the overall relevance of the external market for the representative producer. Assuming that foreign trade is perfectly competitive and priced off the exchange rate according to the law of one price, the representative exporting firm pre-EMU, ironically, may face an enlarged domestic market with *more* pricing power on balance, to the extent that the market using Euros increases relative to that using foreign currencies. This is especially true if the pace of mergers and acquisitions within Euroland continues. To the extent that "inwardization" increases monopolistic power in price setting, it

¹¹ This argument can also be found in McKinnon (1963), who stresses the role of nontraded goods in the reaction to devaluations.

¹² The failure of firms selling *into* the United States fully to pass through exchange rate fluctuations is well-documented (see Knetter (1989), Feenstra (1995), Dornbusch (1987) and Dornbusch (1996)) and could be seen as an indication of what Euroland can expect.

will increase incentives not to adjust prices in their own currency, for reasons stressed by Akerlof and Yellen (1985), Mankiw (1985) and Romer (1996). Increased exposure to the sheltered domestic market will mean greater incentives to price to market and to set nominal prices in advance for longer periods, as customer relations become more important and the net benefits of charging stable nominal prices increase (Okun 1982).

Figure 2. The cost of passive quantity adjustment in response to an exchange rate depreciation



The third and potentially most important effect flows from the credibility that comes from having a central bank which can "stand above" (i.e. ignore) economic conditions in individual countries and be free of political pressure. To this extent if the ECB is really the most independent central bank in the world, agents will be more prone to expect low inflation and will not attribute deviations to policy changes. This important source of inertia should be distinguished from the usual wage-price mechanism (e.g. Blanchard 1990); rather it has to do

¹³ One exception could be energy prices, which continue to be denominated in dollars. As Europe is the largest customer of the oil exporting Middle East and Russia it may come to pass that oil prices are denominated in Euros. The relevant issue of course, is whether oil prices in Euros will tend to become more stable over time.

with the anchoring of inflationary expectations and the effect this will have on the willingness to negotiate contracts in nominal terms.

To give some sense on the evolution of rigidities, I present some simple statistics for data on comparable price and wage time series from EU member countries.¹⁴ Table 2 displays average unweighted correlations of bilateral inflation rates (first difference in the logarithms) for a number of groupings of countries in addition to the Euro-11 since 1961. For comparison, I present data for eight regions of the United States for a similar time period. Clearly, an increase in price convergence has taken place across the board, not only in the smaller "core" groupings. The eigenvalues of the moment matrix indicates the extent to which inflation in one country can be expressed as a linear combination in others. Table 3 documents that, to a large extent, my conclusions hold when looking at a much smaller time interval and when correcting for exchange rate changes.

<Table 2 here >

<Table 3 here >

It has been argued, by Calmfors (1998a) and others, that monetary union could result in increasing nominal money wage rigidity. Presumably this would arise as a result of the low level of inflation and resistance to nominal wage reductions. In addition, the alignment of traded goods prices should impose factor price convergence, as long as complete specialization does not occur first, although this can only be a statement about labor of a given quality. At the same time, Calmfors (1998a) claims that increasingly variable macroeconomic conditions might lead to shorter nominal contract periods and greater nominal wage flexibility.

¹⁴ The empirical evidence I present in this paper is rather modest, as it seems foolish to place much weight on estimates of structures in place before monetary union. On the other hand many investigators have looked at the temporal evolution of cross correlation of price and quantity variables. (For example DeGrauwe (1991), von Hagen and Neumann (1994), Bayoumi and Eichengreen (1996), Frankel and Rose (1996)). For details on the data used, the reader is referred to the Appendix.

Nominal wage behavior in Europe over the past thirty years lends support to my contention that nominal wages are less likely to be rigid than prices. Table 4 and 5 clearly show a determination in the strong positive correlation of real wage growth present in the 1960s and 1970s. To the extent that increasing "entropy" in the behavior of nominal wage movements is reflected by decreasing cross-country correlation, this supports the assertion that nominal wage flexibility is increasing, not decreasing over time. The largest eigenvalue of the moment matrix for first differences in nominal wages, compared with that of nominal prices, is larger and the decline in the eigenvalues are smaller, suggesting that nominal wages in this context do not seem to merit the designation "rigid".

<Table 4 here >

<Table 5 here >

Not only are nominal wages less correlated across European countries than US regions but their levels have exhibited divergence in the past decade. Table 6 displays US BLS data on hourly compensation in the European Union and computes coefficients of variation for the groupings CORE (Belgium, Luxembourg, France, Germany and Austria); CORE+Denmark+France+Italy; The EURO-11 (CORE plus Ireland, Finland, Spain, Portugal, France and Italy). For each grouping Germany was retained and dropped to examine the influence of that country, especially in light of German unification. In all cases except the CORE less Germany (the Benelux countries plus Austria), the cross-country variability of nominal wages *increased* over the ten year period.

<Table 6 here >

III.2. Real rigidities should decrease given current institutions

It is interesting that there are so many who believe that real rigidities in Europe threaten the success of monetary union, and I am sure that my invitation to speak here was related to my perceived views on real rigidities in European labor markets. Indeed a number of arguments can be found to buttress the claim that inflexibility in the labor market will spell the death of EMU. Yet how robust are these arguments to the Lucas Critique, i.e. the introduction of the Euro? In my view, the more important and subtle effect of EMU has largely escaped scrutiny: How will a common currency affect the functioning of labor markets? Could the vaunted lack of labor market flexibility in continental Europe be affected by the introduction of a common currency? If so, how?

Because the quantification of real rigidities is difficult and undoubtedly subject to regime changes (Calmfors 1998a) it seemed unwise to estimate measures of nominal and real wage rigidity; on the other hand it is reasonable to conclude that for the most part the two pressure points on which all real rigidities rest are 1) collective bargaining and unions and 2) the social safety net and especially unemployment benefits. My discussion below will concentrate primarily on these.

The elasticity of labor demand will increase

The first Euro-assault on real rigidities is the weakening of union power in wage determination. While unions are already in retreat in much of the OECD (OECD 1994), in Europe this decline is largely restricted to Britain; membership losses in France and Italy belie an ever-strong influence on central wage setting institutions; in Germany, membership has declined primarily in the East, where it was artificially high to begin with. Yet the brave new world of Euroland portends ill for continental collective bargaining, which has always been a national institution with national idiosyncracies. A simple textbook argument – namely, the

Marshall-Hicks rule of labor demand – predict that the melding of European nations into a currency union will severely attenuate unions' ability to monopolize the supply of labor by increasing the demand elasticity they face.¹⁵

Three of the four elements of the Marshall-Hicks rule will be operative. First, labor unions derive their attractiveness from their ability to tap into quasi-rents that their employers can earn in the market. In a globalizing Europe, product market competition among companies operating with quasi-rents will increase dramatically, which translates into an increase in the elasticity of product demand and the elasticity of the derived demand for labor.¹⁶ Second, the acceleration of intra-European corporate mergers and takeovers opens up the possibility of easy substitution of capital and cheaper labor for more expensive labor within the Euroland area. This attenuates the bargaining strength of national unions. Third, for any given national labor market, the rest of Euroland is large (and possibly getting larger), meaning that the supply elasticities of competing factors is likely to be high.

How will European labor unions cope with these powerful winds of change? Already hamstrung by fragmentation along industrial, regional, or religious lines, they will face language and national cultures as further barriers to their effectiveness. Despite considerable rhetoric, recent searches of labor union literature (including the Internet) have yielded little concrete evidence of an effective Pan-European labor movement. While a similar argument applies to employer associations, the growing transnationality of capital puts labor at a clear bargaining disadvantage – a forced decentralization in the sense of Calmfors/Driffill (1986). The potential for coordinated bargaining strategies is presently incompatible with union structures across countries, which is essential to purposeful pattern bargaining. These

¹⁵ The Marshall-Hicks-rule states that the elasticity of demand for labor is higher, the higher the elasticity of demand for output produced with that labor, the higher the elasticity of substitution between labor and other inputs, the lower the elasticity of supply for those competing inputs, and the greater the cost share of labor in production. See Hamermesh (1993).

structures represent decades of gradual evolution and cannot be changed overnight. To me at least, it seems highly implausible that Europeans will accept wage leadership of German engineering and public sector workers after having finally shaken themselves from the yoke of Teutonic monetary policy!

Strategic interaction of unions with the central bank will change

The argument that labor market rigidities might be endogenous has been made by a number of analysts (Danthine and Hunt 1994, Berthold and Fehn 1997, Dohse and Krieger-Boden 1998 among others). While I take the position that competition will impose decentralization and deregulation of EMU labor markets, a number of analyses emphasize changing strategic interactions between central banks, unions and governments and the effect these can have on aggregate outcomes. In particular the incentives for unions to internalize the effects of their wage demands on the macroeconomy stands at the center of this discussion.¹⁷ An important strand of the literature which has emerged in the run-up to EMU takes Calmfors and Driffill's (1986) contribution as a starting point, which relates the centralization of collective bargaining to the degree to which unions internalize the effect of collective bargaining on the macroeconomy. Early on, the risks of simply extending this analysis to the EMU context were made clear by Danthine and Hunt (1994). They showed that product market integration will play an important role in flattening out the "hump" therefore rendering centralization of collective bargaining less relevant. Another strand has been explored by Cuikerman and Lippi (1998, 1999) who look at strategic interactions of the centralization of nominal wage setting and central bank independence.

¹⁶ For evidence on how product market competition has affected labor unions and labor markets in the US in general, see Duca (1998).

¹⁷ Calmfors (1998a, 1998b), Grüner and Hefeker (1998), Lippi and Cuikerman (1998, 1999), Soskice and Iversen (1999).

While these analyses are intellectually stimulating, I am convinced that the most pressing effects of monetary union derive from the fact that existing market imperfections and distortions will be subject to forces of competition; these effects are likely to swamp Barro-Gordon and Calmfors-Driffill and issues of time-consistency, reputation and coordination. I would therefore go even farther than Danthine and Hunt (1994) and argue that structural change implied for labor and product markets needs to be studied carefully before venturing guesses on the future strategy spaces of policymakers. It is, of course, the Lucas critique again: the elasticity of labor demand will change, the objectives of labor unions will change, their constraint sets will change; the analyses cited above generally assume complete product market integration and ignore capital as a competing factor of production. Local national unions which insist on aggressive wage settlements will be faced with higher local unemployment. Only if the social safety net accommodates higher unemployment, will unions be able to ignore these factors, and given the hard budget constraint of the monetary union, they will find it increasingly difficult to do so.

III.3. The Euro and labor market institutions

An equally interesting hypothesis is that European jurisdictions will adapt and possibly reform labor market regulation in light of the increasing pressures brought about by EMU as well as globalization and technological innovation. In this view, increased competition among member EU states as well as among regions within EU states will lead to a Nash equilibrium in which each member state disregards the effects its behavior has on the others. This type of competition might emerge directly, in which some initiate direct labor market reforms in the hope of "beating the competition" and reap short to medium-term gains; the recent success stories of the Netherlands and Denmark might be viewed in this light. Another channel is increased tax competition – especially, but not only corporate taxation – to enhance the

attractiveness of investment in local economies (*Standortwettbewerb* in the local jargon), as Ireland has done aggressively in recent years. This tax competition puts strain on national member country finances and may force spending cuts and structural reforms. The experience of US states in this regard indicate that this mechanism can be powerful indeed. Bean (1998) has discussed this aspect.¹⁸

At the same time, it seems unlikely that the EU Commission and Parliament will sit idly and watch this "race to the bottom". Already minimum capital taxation has been all but agreed to, while the probability of increased international (intra-European) competition along the social dimension is severely hampered by the Social Charter, which was ratified at Strasbourg Summit in 1989 by all EU governments except the UK.¹⁹ The recent about-face on fast-track membership of the new market economies of Central and Eastern Europe may reflect a fear that unbridled competition in both regulatory and tax dimensions might be triggered by early admission these countries. Yet the lack of consensus for a federal European fiscal policy means that little substantive support for harmonization will come from the top.

III.4. Summary

What are the macroeconomic implications of increasing nominal rigidity and real flexibility, *ceteris paribus*? The empirical evidence, which is meant to be suggestive, support the contention that nominal price rigidity has increased as a consequence of product market integration and exchange rate stability. Nominal wages, in contrast, are highly correlated only in the core, and this applies a fortiori to real wages and real exchange rates as well. These

¹⁸ Arguing from a Barro-Gordon perspective, Calmfors (1998c) has conjectured that incentives to reform inside the EMU are greater than outside, since countries with control over monetary policy are likely to view labor market reform and monetary policy as substitutes for reducing unemployment, while inside EMU the latter vanishes. Reforming labor markets provides one means of insuring against idiosyncratic shocks. This effect will be strengthened by hard fiscal pressures generated by unemployment, as well as the reorientation of national objective functions when inflation can no longer be influenced by national policies. Similarly, Hefeker (1998) assumes unions which choose both the nominal wage and the degree of flexibility.

findings suggest that the Euro will affect labor market flexibility in the direction of *more efficiency*. Without more detailed information on preferences, it is impossible to say whether this increase in efficiency will lead to overall welfare gains; some analyses, such as Agell (1998), claim that labor market rigidities may reflect welfare-improving policies in the light of other market imperfections. Burda (1995) has presented a related rationale for union wage compression.

Wage setting will become more fragmented should moderate unless pan-European efforts arise to coordinate. On the collective bargaining front, managing this change will require Herculean efforts on the part of national labor movements. In this vein one could expect a restructuring of unions in France, Spain and Italy (and possibly the UK) towards centralized industrial unions in order to facilitate cross border cooperation; Dohse and Krieger-Boden (1998) describe the emergence of "European Works Councils" in large enterprises. Yet the reality of labor relations in these countries as well as the divergence of the interests of labor at the national level portend less dramatic changes (Streeck 1998). While the possibility of pattern bargaining by large industrial unions – as in Austria, Germany, or Sweden – is frequently discussed, it is difficult to see how it could lead to truly coordinated outcomes without a strong central organization as is the case in these countries. Because I see pan-European coordination coming in a decade's time at the earliest, a more modest goal for organized labor would simply be to get control over the process. The example of Eastern Germany can be seen as a lesson on how *not* to do it.

Increasing nominal wage flexibility combined with nominal price rigidity is likely to lead to increased real wage flexibility. Casual evidence I have assembled in Tables 7 and 8 show that real wage behavior in EU members has become increasingly uncorrelated over time, and that this tendency increases with the size of the group considered. This can be contrasted

¹⁹ For a discussion of these issues see Belke (1996).

with US evidence, which shows a remarkably high correlation given the size of the regions considered.

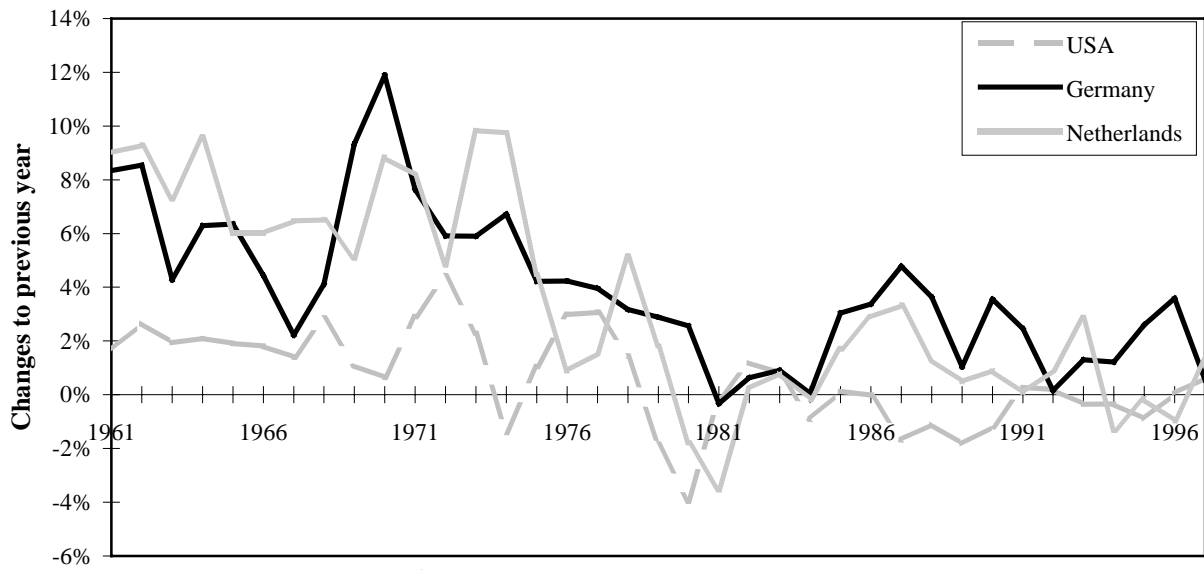
<Table 7 here >

<Table 8 here >

The empirical evidence suggests that while there is enough "insurance potential" in many respects to reduce Europe-wide risks, it is not showing up in wage growth rates. The dramatic deterioration of real wage correlations is evidence, to my mind at least, that there is potential for flexibility, at least between the "core" and the rest of the Euro-11. This flexibility supports my contention of a "forced decentralization" which would not have been less likely had a two-track solution to the monetary union question been implemented. The breakdown of the synchronous behavior of real wage growth in Germany and Holland in the early 1990s depicted in Figure 3 is one example of how this has occurred.

The macroeconomic implications of increasing nominal rigidity and declining real rigidity, *ceteris paribus*, are somewhat surprising. The old conventional wisdom (Sachs 1979, 1983, Bruno and Sachs 1985) was that the United States was characterized by nominal rigidity but real wage flexibility; the nations of Europe in contrast had real rigidities but not nominal ones, which led to accentuated responsiveness of nominal wages to aggregate demand movements and to an attenuation of policymakers' ability to use monetary policy even to the limited extent now allowed in mainstream macroeconomics. The implications of my analysis is that Europe is likely to develop a more pronounced, common cycle as its own response to monetary policy evolves. This is the conclusion reached by more recent analyses such as Jeanne's (1998).

Figure 3. Growth Rates of Real Hourly Compensation Costs in Manufacturing, 1960-1996



Sources: U.S. Department of Labor, OECD

IV. Concluding Remarks

In addition to its historic dimensions, European Monetary Union (EMU) will shed new light on a number of old, bothersome questions. Naturally, it will help us understand better how monetary unions function. In the first instance, however, it will teach economists and policymakers the relevance of the new Keynesian approach to understanding aggregate fluctuations, for which there is precious little evidence in the data. It will also help us decide whether nominal price or wage rigidities are more relevant for explaining the real effects of aggregate demand fluctuations and thus the transmission mechanism itself.

The convergence of exchange rate and especially price dynamics suggests that the preconditions for nominal price rigidities have become more favorable in Euroland. At the same time, trends in money and especially real wages point to declining importance of real rigidities. Real economic conditions and institutions are increasingly unfavorable for

"business as usual" in the European union; the breakaway behavior of the Netherlands, Denmark and possibly Ireland and Portugal support the hypothesis that EMU is a Trojan horse of decentralization – not only *de facto*, but more importantly for structural reasons related to product and capital market integration.

As many have recognized, the functioning of labor markets is central to the macroeconomic future of Euroland, but the mechanisms are remarkably subtle. The most important of my messages can be summarized as follows. First, the introduction of common currency, price transparency and internal trade integration --- will lead to a "inwardization" of the European continent with the implication that internal and external nominal shocks will have less impact on nominal wage and price setting, and show up more strongly in output variation. Second, the standard analysis suggests that this will be related to the extent the underlying real economy is responsible for output fluctuations. In the past continental European countries were known for their "real rigidities" and inflation appeared to respond rapidly to changes in nominal demand.²⁰

Yet my prediction that the EMU amounts to a "forced decentralization program" which will subject these rigidities to increasing pressure is accompanied by an optimism that a reduction of these rigidities will follow. Most important of the forces are increasing capital mobility, trade integration, and competition, which will force wages for labor of given quality to converge (factor price equalization) as well as to react more flexibly to changing local real conditions. Labor mobility, while a central point of discussion, is a side show which isn't as relevant in the short run for the US as its made up to be.²¹ As more continental European

²⁰ See Bruno and Sachs (1985), Chapter 11, especially pp. 232-40.

²¹ Willem Buiter (1995) has made this point, as have others. The results of Blanchard/Katz (1992) imply adjustment to adverse shocks in the United States which are long and drawn out over several years.

countries scale back safety nets, it will become increasingly difficult for real wage determination to stay out in front of nominal developments. This flattening of the Phillips and aggregate supply curves will facilitate a more potent monetary policy. My prediction is that, unless an improbable miracle occurs in pan-European collective bargaining, labor markets will become *more* and not less flexible in the future. Calls for additional flexibility may be the economic equivalent of whipping a dead horse, and could provoke counterproductive reactions.

As if it were not controversial enough to sell the Euro as the Trojan horse which liberalized labor markets, I find it highly likely that it will change the macroeconomics of Europe fundamentally over the next decade and thus foster in a new regime for fiscal and monetary policy. Monetary policy should gain a new potency, as Europe begins to look more like the US and Japan and less like Germany and France. A new role for monetary policy should emerge, although the usual caveat remains that the effectiveness of monetary policy is largely an artifact of its not being used in a predictable way to inflate the economy (Taylor 1980). Therefore my paper should not be construed as endorsing Oskar Lafontaine's "domestic demand strategy", but rather a warning that the temptation to employ such a strategy will increase in future years.

Of course, my analysis is predicated on the view that nominal rigidities, especially price rigidities, are important in the evolution of a macroeconomy in the short run. If I turn out to be wrong and have to eat my hat, this fact will nevertheless have been useful information for our profession as well as policymakers. If I am right, European Monetary Union will have delivered the ultimate bonus in real efficiency gains for the unemployment-riddled labor markets of the Continent.

Table 1. Intra-EU Foreign Direct Investment Flows, 1985-1994 (% of GDP)

Country	Direct Investment Inflows From EU countries		Balance of Direct Investment to other EU countries	
	1985-1989	1990-1994	1985-1989	1990-1994
Ireland	(0.32)	(0.13)	n.a.	n.a.
Portugal	1.01	1.72	0.96	1.38
Spain	1.02	1.54	0.81	1.24
Sweden	0.26	1.11	-1.25	-0.69
Denmark	0.39	1.05	-0.27	-0.05
Netherlands	0.91	1.29	-0.26	-1.34
Belgium/Luxembourg	1.64	3.05	0.36	0.73
United Kingdom	0.84	0.69	-0.01	-0.17
Austria	0.24	0.35	0.07	-0.08
Italy	0.24	0.19	-0.03	-0.17
Greece	0.21	0.53	n.a.	n.a.
Finland	0.23	0.47	-0.73	-0.75
Germany	0.17	0.11	-0.28	-0.62
France	0.42	0.67	-0.19	-0.26

Source: Dohse and Krieger-Boden (1998). Numbers in parentheses are described as highly unreliable.

Table 2. Synchronization of Price Inflation in Europe and USA

	Average Correlation Coefficient in Group (std. error)			Smallest and Largest Moment Matrix Eigenvalues (1961-79) and (1980-96)		Percentage change
	Total Sample	1961-79	1980-96	1961-79	1980-96	
Core Europe (B,NL,D,A)	0.76 (0.08)	0.80 (0.06)	0.82 (0.09)	9.82×10^{-4} 0.207	5.89×10^{-4} 0.0928	-39.9% -55.2%
Core Europe + F, DK, IT	0.74 (0.11)	0.71 (0.13)	0.81 (0.12)	8.74×10^{-4} 0.560	1.64×10^{-4} 0.363	-81.2% -35.1%
Euro-11 lite*	0.73 (0.14)	0.73 (0.14)	0.80 (0.15)	6.53×10^{-4} 0.983	3.88×10^{-5} 0.602	-94.1% -38.8%
Euro-11 lite* + DK, S, UK	0.71 (0.13)	0.70 (0.15)	0.78 (0.14)	3.17×10^{-4} 1.336	3.69×10^{-5} 0.811	-88.4% -39.3%
Memo: USA 8 Regions, 1978-1992, GSP deflator	0.95 (0.03)	–	–	1.48×10^{-5} 0.376	–	–

Note: Inflation is measured as first difference in the logarithm of the relevant price index
*less Luxembourg. Portugal

Source: US: Bureau of Economic Analysis (REIS), International Monetary Statistics.

Table 3. Inflation Correlations, in National Currency and DM Terms

	Average Correlation Coefficient in Group					
	Annual OECD Inflation Rate			Annual OECD Inflation Rate in DM-Terms using BLS exchange rates		
	Total Sample	1976-86	1987-96	Total Sample	1976-86	1987-96
Core Europe (B,NL,L,D,A)	0.82 (0.10)	0.81 (0.08)	0.77 (0.12)	0.56 (0.27)	0.52 (0.31)	0.70 (0.17)
Core Europe + F, DK, IT	0.80 (0.11)	0.79 (0.12)	0.33 (0.50)	0.45 (0.23)	0.45 (0.25)	0.38 (0.41)
Euro-11	0.79 (0.13)	0.67 (0.26)	0.48 (0.37)	0.44 (0.21)	0.48 (0.24)	0.37 (0.40)
Euro-11 + DK, S, UK	0.78 (0.12)	0.67 (0.24)	0.45 (0.41)	0.49 (0.21)	0.54 (0.22)	0.38 (0.42)

Note: OECD inflation corrected using BLS exchange rates

Source: OECD.

Table 4. Synchronization of Nominal Wage Growth In Europe and USA

	Average Correlation Coefficient in Group (std. err.)			Smallest and Largest Moment Matrix Eigenvalues (1961-79) and (1980-96)		
	Total Sample	1961-79	1980-96	1961-79	1980-96	Percentage change
Core Europe (B,NL,D,A)	0.85 (0.06)	0.76 (0.17)	0.46 (0.11)	2.15×10^{-3} 0.688	1.24×10^{-3} 0.130	-42.3% -81.0%
Core Europe + F, DK, IT	0.72 (0.15)	0.52 (0.32)	0.48 (0.18)	1.49×10^{-3} 1.49	6.59×10^{-4} 0.451	-55.8% -69.8%
Euro-11 lite*	0.71 (0.15)	0.46 (0.35)	0.55 (0.22)	5.58×10^{-4} 2.39	2.57×10^{-4} 0.760	-54.0% -68.2%
Euro-11 lite* + DK, S, UK	0.66 (0.18)	0.48 (0.31)	0.50 (0.26)	1.80×10^{-4} 2.96	6.07×10^{-5} 0.981	-66.2% -66.9%
Memo: USA 8 Regions, 1978-1992, annual comp.	0.92 (0.06)	–	–	2.01×10^{-5} 0.449	–	–
Memo: USA 8 Regions, 1978-1992, wages/salaries	0.90 (0.08)	–	–	1.65×10^{-5} 0.425	–	–

Note: Nominal wage growth is measured as first difference in the logarithm of the wage index.
*less Luxembourg. Portugal

Source: US: Bureau of Economic Analysis (REIS), International Monetary Statistics.

Table 5. Nominal Manufacturing Wage Growth Correlations in National Currency and DM Terms

	Average Correlation Coefficient in Group					
	Annual Nominal Wage Growth in Manufacturing in Local Currency			Annual Nominal Wage Growth in DM Basis		
	Total Sample	1976-86	1987-96	Total Sample	1976-86	1987-96
Core Europe (B,NL,L,D,A)	0.68 (0.11)	0.64 (0.12)	0.42 (0.34)	0.44 (0.27)	0.44 (0.26)	0.39 (0.33)
Core Europe + F, DK, IT	0.66 (0.12)	0.59 (0.22)	0.22 (0.33)	0.29 (0.25)	0.25 (0.31)	0.24 (0.25)
Euro-11	0.68 (0.13)	0.56 (0.19)	0.34 (0.33)	0.30 (0.27)	0.28 (0.32)	0.28 (0.39)
Euro-11 + DK, S, UK	0.65 (0.13)	0.55 (0.19)	0.30 (0.35)	0.32 (0.27)	0.33 (0.30)	0.26 (0.40)

First differences in log hourly nominal compensation costs for production workers in manufacturing, in local currency or in DM converted using annual average exchange rates.

Source: US Bureau of Labor Statistics, authors calculations

Table 6. Nominal Wages in Manufacturing in the EU, 1986 and 1996

<i>Money Wages in Europe in Dollars</i>			<i>Unweighted Coefficients</i>		
<i>(nominal hourly compensation)</i>			<i>of Variation of Nominal Wages</i>		
<i>Land</i>	<i>1986</i>	<i>1996</i>	<i>Grouping</i>	<i>1986</i>	<i>1996</i>
Luxembourg	10.86	22.55	CORE	0.095	0.143
Belgium	12.43	25.89	(A,B,D,L,NL)		
Germany	13.43	31.87			
Netherlands	12.22	23.14	CORE less D	0.077	0.064
Austria	10.73	24.95			
France	10.28	21.19			
Denmark	11.07	24.24	CORE +DK,I,F	0.098	0.173
Italy	10.47	17.48			
Finland	10.71	24.95			
Ireland	8.02	13.85	" less D	0.076	0.123
Portugal	2.08	5.58			
Spain	6.25	13.40			
Sweden	12.43	24.56	EURO-11	0.331	0.358
UK	7.66	14.13			
memo:USA	13.26	17.70	" less D	0.336	0.342

Source: US Bureau of Labor Statistics, Office of Technology and Productivity.

Table 7. Synchronization of Real Wage Growth in Europe and USA

	Average Correlation Coefficient in Group			Smallest and Largest Moment Matrix Eigenvalues (1961-79) and (1980-96)		
	Total Sample	1961-79	1980-96	1961-79	1980-96	Percentage change
Core Europe (B,NL,D,A)	0.60 (0.08)	0.69 (0.16)	0.24 (0.38)	2.69×10^{-3} 0.170	9.04×10^{-4} 0.014	-66.4% -91.5%
Core Europe + F, DK, IT	0.59 (0.13)	0.45 (0.24)	0.08 (0.41)	1.76×10^{-3} 0.291	2.76×10^{-4} 0.018	-84.3% -93.6%
Euro-11 lite*	0.55 (0.13)	0.36 (0.25)	0.06 (0.42)	9.96×10^{-4} 0.405	1.937×10^{-4} 0.026	-80.6% -93.5%
Euro-11 lite* + DK, S, UK	0.46 (0.20)	0.35 (0.24)	0.14 (0.39)	5.62×10^{-4} 0.455	1.35×10^{-5} 0.036	-97.6% -92.1%
Memo: USA 8 regions, 1978-1992, real comp.)	0.59 (0.18)	–	–	6.68×10^{-5} 0.016	–	–
US (8 Regions, 1978-1992 real wages and salaries)	0.55 (0.20)	–	–	6.10×10^{-5} 0.016	–	–

Note: Real wage growth is measured as first difference in the logarithm of the nominal wage index reported by the IMF, International Finance Statistics, divided by the IMF/IFS consumer price index.
*less Luxembourg. Portugal

Table 8. Manufacturing Real Wage Growth Correlations Using Different Price Indexes

	Average Correlation Coefficient in Group					
	Wages deflated by OECD Price Index			Wages deflated by IMF Price Index*		
	Total Sample	1976-86	1987-96	Total Sample	1976-86	1987-96
Core Europe (B,NL,L,D,A)	0.39 (0.25)	0.49 (0.23)	0.06 (0.49)	0.44 (0.26)	0.50 (0.23)	0.17 (0.59)
Core Europe + F, DK, IT	0.22 (0.26)	0.27 (0.30)	0.13 (0.38)	0.23 (0.43)	0.27 (0.27)	0.13 (0.43)
Euro-11	0.13 (0.25)	0.14 (0.30)	0.13 (0.36)	0.12 (0.25)	0.12 (0.29)	0.13 (0.38)
Euro-11 + DK, S, UK	0.14 (0.23)	0.17 (0.29)	0.13 (0.35)	0.14 (0.38)	0.16 (0.29)	0.14 (0.36)

*Luxembourg excluded.

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APPENDIX

In Tables 2-9, I present some suggestive evidence in support my twin hypotheses of increasing nominal rigidities on the one hand and decreasing real rigidities on the other. The variables considered are 1) consumer prices, 2) nominal wages for the total economy 3) real wages, all from the IMF IFS and using a longer sample (1961-1996); data gathered by the US Bureau of Labor Statistics (<http://stats/bls/gov/proghome.htm>) on manufacturing wages and exchange rates; and the OECD price index (1976-1996). Correlations of first differences in logarithms of these variables were examined in different grouping: a core group (Germany, Luxembourg, Belgium, Holland, and Austria); the core plus France, Italy and Denmark; the Euro-11; and finally the Euro-11 adding back Denmark, plus Sweden and the UK. The average correlation coefficient provides a rough indicator of the co-movement, while eigenvalues of the moment matrix indicates the extent to which linear combinations of countries' experiences can replicate others; the number of eigenvalues close to zero later indicates the extent to which "insurance" is possible.