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European integration, liberalisation and labour market performance

A report for the Fondazione RODOLFO DEBENEDETTI

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Introduction

1. The construction of unified Europe is one of the main long-wave movements in postwar history. The main driving force for this essentially political objective has been its compelling economic rationale. The creation of a single European market has been widely seen as advantageous for all participants and beneficial to living standards of European citizens. Much in the same vein, many EU governments willingly took the steps towards the establishment of the European Monetary Union because they were generally perceived as bringing about beneficial political economy consequences, such as creating a consensus for implementing some of the changes in institutions and policies which are needed to ensure long-run sustainable growth in the European economies. Unfortunately, however, the movement towards unification has failed so far to contribute significantly to the economic objective of reducing high and persistent unemployment, which is most important for maintaining the momentum and the social cohesion of European societies around the European project. Indeed, structural unemployment among EMU members is still much higher than in other OECD countries and, more importantly, European

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labour markets do not seem yet to be able to face the challenges posed by developments in the world economy with the dynamism shown by North American economies.

2. The main objective of this report is to investigate whether there is any force inherent to European economic and monetary unification that is likely to markedly affect the structural weaknesses bridling the employment performance of European economies by inducing changes in behaviour or policies. Alternatively, an additional effort would be needed on behalf of European institutions and the member governments to implement the structural policies that are believed to be effective for reducing unemployment. Several conjectures have been made as to the causes of and remedies to European unemployment: the lack of employment flexibility, the tax burdens and distorted incentives created by unbalanced welfare systems, the weaknesses in human capital formation, the constraints to the business environment created by excessively restrictive and obsolete regulations, etc.. The report focuses mainly on weak product market competition, and regulations causing it, as a potential explanation for the disappointing employment performance of many European economies. Our working hypothesis is that product market competition, or the lack of it, interacts with labour market regulations and institutions to affect in important ways the functioning of the labour market. Therefore, the question is whether market integration, EC competition policies and the EMU provide sufficient constraints and/or incentives to private agents and member governments for increasing competitive pressures in European product markets, inducing at the same time the institutional changes and reforms needed to make labour markets more flexible.

3. At present, there is a tension between European-wide harmonisation and liberalisation of product markets, the persistence of domestic impediments to product market competition, which remain often unaffected by EC initiatives, and the essentially domestic nature of institutions and policies determining industrial relations. Undeniably, spurred by the EC, European economies have taken big steps to make the business environment, especially in utility industries, friendlier to competition. However, the action of the EC is bounded by the Treaty of Rome and, despite the increasing role played by the European Court of Justice in broadening the range of national policies considered to be an obstacle to internal trade, there are a number of areas (such as the dismantling of legal barriers to entry in certain service activities, regulations constraining the provision of business and personal services and administrative measures *de facto* limiting the

number of competitors in local and public procurement markets) that remain largely under the realm of domestic policies that are often unfriendly to competition. The so-called Cardiff process, which is partly concerned with EU-wide developments in product market competition, is only a monitoring initiative that does not contemplate an enlargement of the EC role or stringent guidelines regarding product market reforms by member governments. National prerogatives are even stronger in labour market policies, where the so-called Luxembourg process is confined to providing only general guidelines within which governments are required to reform their domestic policies.

4. This tension raises a number of interesting issues that we address in the report. Are trade integration, the EC effort to liberalise product markets and the creation of the single currency sufficient to raise significantly competitive pressures in the Union? Will product market competition become sufficiently intensive to have sizeable effects on European unemployment? How will labour market institutions and regulations interact with the more competitive product market environment in determining labour market outcomes? Will the new competitive environment lead to changes in those institutions and regulations? Is there any evidence of a systematic relationship between national regulatory approaches in the labour and product markets? What will be the effects of the single currency on incentives for institutional change and structural reform? Given that EU-wide liberalisations and monetary integration are relatively recent, answers to these questions are somewhat speculative. In order to provide concreteness to our analysis we often concentrate on the historical experience of those EU countries which most consistently pegged their currency to the D-Mark, creating a *de facto* (and *ante litteram*) integrated monetary area.

5. We begin by reviewing the status of cross-border and domestic competition in the EU (**Section 1**). Market integration and product market competition are hardly empirical concepts that have to be checked against the data. However, at the risk of over-simplifying a complex issue, we look at developments in the degree of integration and competition focusing on a few indicators for which data is available: similarities and convergence over time of price structures, differences in price levels and estimates of the levels and trends of profit margins. We assume that, as cross-border and domestic competitive pressures increase, price structures should become more and more similar through a price convergence process. As a result, not only price level differences

should decrease, but prices themselves should decline as price-cost margins shrink in competitive industries and efficiency gains are more easily transferred to consumers. We therefore consider a lack of price similarity and convergence, and abnormally high mark-ups and product prices as an indication that market integration and product market competition are insufficiently strong.

6. Our results suggest that price structures within the EU are more similar than among other OECD countries, especially for consumer goods and tradables, and that a long wave of price convergence has been in motion over the past two decades, even for services and other non-tradables. It is unclear, however, what is the “right” level of similarity for economies that have the ambition of forming an economic and monetary union. The little evidence we have on price structures within the US would suggest that, even though EU cross-border and domestic competition is increasing, the remaining cross-country price disparities are a symptom of insufficient competitive pressures. The relative weakness of the competitive environment tends to be confirmed by the fact that on average EU price levels compare poorly with prices prevailing in the best performing countries, leaving European consumers worse off relative to their peers in North America. This phenomenon can partly be related to the continuing presence of significant market power by European firms even in competitive manufacturing industries. In this respect it is particularly worrying that the price convergence process seems to have slowed down *after* the establishment of the Single Market in 1992. One interpretation of this phenomenon is that while private agents have adjusted to the new economic environment, public policies still provide firms with large opportunities to exploit market power originating from regulatory barriers to entry in domestic markets and non-tariff barriers to trade and investment.

7. What are the potential consequences of insufficient competitive pressures in product markets for the performance of the labour market? Is there any relationship between the institutional and policy factors influencing the structure of product markets and those affecting the functioning of labour markets? In **Section 2** we draw on economic theory to find answers to these questions. We argue that there are sound reasons to expect an increase in product market competition to result in higher employment at both the firm level and at the aggregate level: in essence, a comparatively high degree of product market competition will make labour demand more elastic and shift it outwards. Therefore, *ceteris paribus*, we should observe higher employment rates in countries with higher overall levels of product market competition. The

analysis of wage behaviour is more complex. Due to rent sharing behaviour, wage rates can be expected to be inversely related to product market competition at the firm level. However, in the aggregate the relationship between wages and product market competition is ambiguous since higher aggregate labour demand could very well increase economy-wide wages. Therefore, more intense product market competition can result in both higher employment and higher wages. The structure of product markets can also affect the optimal composition of employment. Economies with higher overall levels of product market competition, *ceteris paribus*, may exhibit higher levels of self-employment. However, if the general regulatory framework is less onerous for small firms than the larger corporations, then we may well observe a positive overall relationship between self-employment and the strictness of regulation, to the extent that the latter changes the relative prices of different kinds of labour. Higher levels of product market competition should also be associated with higher levels of macroeconomic stability, *ceteris paribus*. This is because increased real flexibility tends to reduce the impact of both demand and supply shocks, lowering as well their persistence over time. Finally, we expect increases in product market competition to create the conditions for seeking more flexibility in labour markets, since firms facing more competition are under pressure to respond more rapidly to fluctuations in the markets in which they operate. Therefore, we may observe a positive association between the stringency of product market regulations, which affect the overall degree of market competition, and regulations reducing the flexibility of labour markets.

8. While there is a consensus that increased product market competition is likely to have a positive effect on employment, there is no agreement on its empirical relevance. In **Section 3** we attempt to check some of the predictions of the theoretical analysis by looking at the comparative experience of OECD countries over the past two decades. In order to take into account the potential interactions between the features of labour and product markets, we look at factors affecting both product market competition and labour market flexibility. To date, the empirical analysis of the linkages between product market competition and labour market performance stumbled upon the lack of adequate indicators expressing the intensity of competition, especially in a cross-country context. In addition, the finding of an empirical relationship between product market competition and labour market outcomes has been sometimes difficult to interpret and often of dubious policy relevance. Difficulties in interpretation generally arise from the fact that labour market variables and product market competition measures are often endogenous to each

other (e.g. wages and measures of market power). Policy irrelevance occurred because indicators of the intensity of product market competition (such as industry concentration indices) are generally not useful for competition authorities, which operate at the level of micro-markets. In order to overcome some of these problems, this section takes a different approach. Since the degree of competition in the product market is not directly measurable we use some of its policy determinants as proxies, such as regulatory provisions affecting entry and favouring large, possibly state-controlled, incumbents and trade regulations. We also explore the role of regulations in the labour market on performance and assess their relationship with regulations in the product market. This is made possible by the use of a novel set of quantitative indicators of cross-country differences in the stringency of the product and labour market regulatory environments in OECD economies.

9. Overall, the empirical results lend support to the theoretical considerations discussed in the previous section. We find that countries tend to adopt similar regulatory approaches in the labour and product markets: where product market regulations restrict competition and state interference in the business sector is high, labour markets tend as well to have tight legislation protecting workers, especially those under permanent contracts. One interpretation of this finding is that policies aimed at making labour markets more flexible are better implemented in a liberal product market environment. Moreover, even controlling for a number of policy and institutional factors affecting the labour market, it is possible to detect significant effects of the summary indicators of both EPL and product market regulation on the level and composition of employment rates of OECD countries. In particular, countries with tight EPL and restrictive product market regulation tend to have lower employment rates in the non-agricultural business sector. At the same time, biases in the regulatory environment will tend to distort the composition of employment. In particular, higher regulatory and administrative burdens for corporations relative to sole proprietor companies tend to increase the proportion of self-employed in the non-agricultural business sector. There is also some evidence that strict regulations in the product and labour markets may lead to wage premia in the manufacturing sector, as firms may share part of the rents with workers. There are, however, significant differences across industries which are likely to depend on the specific market structures in which they operate and thus on the effectiveness of regulations to protect incumbents from domestic and foreign competition.

10. Given that the available evidence suggests that there is scope for increasing product market competition in the EU and that such an endeavour would most probably have positive repercussions on labour market performance, in **Section 4** we investigate whether the major institutional change brought about by the EMU is likely to favour an increase in cross-border and domestic competitive pressures. We explore two avenues through which the EMU could impact on product market competition: an increase in competitive pressures through enhanced price transparency (which makes it easier for agents to arbitrage between tradables and for firms to compare labour costs); and a change in the willingness of workers to accept, of firms to lobby for and of governments to implement reforms in labour market institutions and in labour and product market regulations. In doing this we draw from the historical experience of quasi monetary unions, such as the D-mark and the EMS areas.

11. Looking at cross-border price differences, we find that countries in the D-Mark area have a higher level of price similarity, but even controlling for a number of factors (such as initial conditions, trade intensity and preferences) we find no evidence of stronger price convergence than in other EU countries. Thus it would seem that it is the similarity of economic structures (and the corresponding cost-price combinations) that favored membership in the hard-currency area rather than participation in the D-Mark area that led to price similarity. Even though the impact of the EMU could be different, notably because it is a much more credible monetary arrangement, these results cast doubt on the hypothesis that monetary union by itself will increase significantly product market competition. Turning to the second channel, we looked both at direct and indirect evidence of the relative significance of changes in government policies and union and employer behaviour within hard-currency areas and in other OECD countries. Direct evidence involved a cursory review of institutional changes and structural policies observed in the past decade, while indirect evidence relied on estimates of cross-country differences and changes over time in the degree of nominal and real flexibility of the economy, under the assumption that these could be related to differences and/or changes in agents' behaviours and policy approaches. Overall, we find reasonable evidence that contractual and bargaining arrangements favoring real wage flexibility go hand in hand with monetary integration. However, since we did not find any change in behaviour following the accession to a hard-currency area, we cannot establish whether it is monetary integration that fosters changes in behaviour or implementation of monetary integration that is easier for countries in which such arrangements already exist. At the same time there is

very little evidence, and no clear indications from theory, that monetary integration in itself might increase the propensity of member governments to pursue the structural policies needed to make product markets more competitive and labour markets more flexible.

12. Where does this analysis leave us in terms of our initial question as to the ability of economic and monetary integration to improve the disappointing employment performance of the EU? There is evidence that both product market competition and labour market flexibility have been fostered by integration. However, there is still considerable scope for increasing competitive pressures within the EU. Product market competition could be promoted effectively by further streamlining, simplifying and reforming product market regulations. Our analysis suggests that the gains to be reaped from such a reform effort are twofold: increased product market competition is likely to set the stage for a reduction in labour market rigidities and more flexible product and labour markets may improve significantly EU employment prospects. However, the general feeling is that while private agents, unions and employers, have adjusted (and are adjusting) their behaviour to meet the challenge of economic and monetary integration, national governments implement structural reforms at a much slower pace. Based on the review of past experiences in highly integrated areas, it is unlikely that the Single Market and EMU will be sufficient conditions to bolster the reform effort. Therefore, an acceleration of the EC initiatives to liberalise product markets as well as an increased commitment to structural reform by national governments is in order if labour market performance is to be improved in the EU.

SECTION 1

INTEGRATION, LIBERALISATION AND PRODUCT MARKET COMPETITION

13. The landmark of the past two decades of structural policies in Europe has been the move towards full trade integration (the Single Market) and the effort of the European Commission to remove obstacles to trade in the Single Market by stepping up the implementation of competition policies and pushing forward the liberalisation of several industrial (especially utility) sectors. A detailed account of this reform process and of its (still controversial) impact on the EU economies is outside the scope of this report¹. It is widely believed that, once completed, this process will lead to significant benefits for European consumers, in terms of the quality, the variety and the price of goods and services sold in the EU, improving overall living standards². These benefits are expected to result mainly from an increase in the intensity of cross-border and domestic competition in European product markets.

14. Looking at some of the driving forces of EU-wide product market competition suggests that competitive pressures are likely to have increased within the Single Market. First, external trade and foreign direct investment have continued to increase, exposing domestic firms to competition by foreign firms. External (intra-EU) trade in goods has increased, rising from 27% in 1993 to 32% in 1997 whereas intra-EU foreign direct investment inflows have risen from 0,8% of GDP to 1% GDP over 1992-1997 (see CEC (1999a)). Moreover, since 1970, there is also a clear

¹ Efforts to do so include Molle (1997).

² For instance, recent OECD (1997) estimates of the expected impact of regulatory reform in five sectors of the European economy (telecommunications, electricity, airlines, road transport and distribution) point to expected gains ranging from 3% of GDP in Sweden to 6% of GDP in Spain.

trend towards increased intra-industry trade for most member states, pointing to an increasing similarity in the industrial structures of the member states. As trade is more and more often in similar products, the increase in trade flows may understate the actual increase in competition due to more market openness. Second, regulatory reform, including changes in (national and EC) competition policies and EC directives liberalising domestic utilities markets in areas such as telecommunications, postal services, electricity and gas, have reduced barriers to (foreign and domestic) competition. Third, the interaction of technological change and regulatory reform has also contributed to increasing competition, putting pressure on existing market structures³. Despite these general trends, domestic regulatory barriers are still significant in many countries, especially in service sectors and public procurement, lessening the impact of trade integration and liberalisation on product market competition.

15. For the purposes of this report, which focuses on the effects of integration and liberalisation on labour market outcomes, it is paramount to examine some direct evidence on the effects of the reform process on the degree of product market competition in EU markets. Unfortunately, the intensity of competition on markets for goods and services is an issue which is intrinsically difficult to observe. Market competition is the result of a complex interaction of forces which influence both the playing field European firms are operating in and firm behaviour itself. Moreover, the degree of competition should ideally be measured at the level of the relevant antitrust markets.⁴ However, as antitrust markets generally do not coincide with the statistical categorisation of firms into industries, one necessarily has to rely on more general measures of competition at a relatively high level of aggregation, which may hide a considerable heterogeneity at the level of individual firms and products⁵. In the following we look at three (admittedly imperfect) indicators of the progress achieved in fostering market mechanisms and increasing competitive pressures within the EU: price convergence, price levels and profit margins.

³ For example, technological change in mobile communication, accompanied by regulatory reforms, has immensely changed the sources of competitive advantage in this market, the formerly dominant players now contested by the entry of new, low-cost providers of mobile communication.

⁴ Haffner and Van Bergeijk (1998).

⁵ Different sectors may be affected by integration to different degrees, depending on a number of structural, behavioural and policy factors which will tend to differ across sectors and countries.

Price similarity and convergence

16. Reduced price differentials (or more similar price structures) among EU-countries can, at least in part, be attributed to increased competition and market integration. The elimination of barriers to trade by the single market programme and other regulatory reforms should erode market power, thereby reducing the potential for price discrimination across EU-markets. Therefore, in the absence of new collusive behaviour, increased integration should result in more active price competition (instead of firms relying on non-price aspects and trade barriers).

17. However, even within fully integrated economies, consumer prices may vary to a certain extent due to differences in indirect taxation, exchange rate fluctuations, national preferences for different products, differences in the market structure of the retail and wholesale sectors and transport costs. In addition, as the international comparison of prices is beset with methodological and statistical difficulties, estimates of price disparities should be interpreted with caution. For instance, data limitations may be masking differences in quality across goods. This could mean that the observed heterogeneity in prices is partly due to product differentiation. Therefore, the analysis of EU price differentials can only provide a rough indication of the intensity of product market competition and the remaining potential for improvement.

18. In the following, we focus on the similarity between price structures and their convergence over time, comparing developments in both EU and other OECD countries. In this context, we look at some of the factors potentially affecting similarity, such as the typology of products, their tradability and the presence of trade barriers. The analysis is based on the comparison of price developments for a large set of products over a period of eleven years. To this end, we use the data on *Purchasing Power Parities and Real Expenditures* produced by Eurostat and the OECD in the context of the United Nations International Comparisons Project, which provides the prices of over 200 categories of goods and services observed in 1985, 1990, 1993 and 1996.

19. Using the so-called Grubel-Lloyd index (familiar from trade literature, where it is used to measure the degree of intra-industry trade) we look directly at bilateral price similarities across

countries⁶. This approach has several advantages over earlier ones focusing on the degree of overall price dispersion, as measured for instance by the coefficient of variation (see CEC, 1997a). The similarity index, which approaches 100 as the price structures of two or more countries become more similar, makes it possible to summarise the differences in the price structures of two or more countries, isolating the country-specific from the product-specific effects. Therefore it allows a more direct identification of the areas and product types in which progress has been made. In addition, the set of bilateral indices can be used to check whether convergence (or the lack of it) may be explained by economic factors, such as initial conditions, trade intensity or barriers to trade.

20. Table 1.1 summarises unweighted price similarities and their development over the 1985-1996 period for both EU and non-EU countries⁷. In the table, goods and services are classified by basic expenditure heading and degree of tradeability, consistent with CEC's (1997a) classification. The degree of price similarity is substantially higher among EU countries than among non-EU countries. Cross-area differences in similarity are particularly striking for consumer and tradeable goods (two sets which broadly coincide), underscoring the effects of market integration on cross-border competition. The overall degree of price similarity is considerably lower for non-tradeables (80,6 for non-tradeables versus 86,3 for tradables within the EU), demonstrating the considerable scope for price convergence in the non-tradeable sector. For both EU and non-EU-countries, the equipment goods sector has the highest degree of price similarity, indicating that it may have become an international or even global market.

⁶ The index is:

$$\text{Similarity index} = 100 - \sum_{a=1}^m \sum_{i=1}^n w_i \frac{|p_{ai} - p_{bi}|}{p_{ai} + p_{bi}} * 100$$

where p_{ai} and p_{bi} are the average prices of product category i in countries a and b respectively and w_i is the weight assigned to product i in the calculations. Other measures sometimes used to perform bilateral comparisons of price structures, such as the correlation coefficient, are unsuitable for this purpose as they depend on the choice of the *numeraire* (e.g. the US price level). A change in *numeraire* influences both the level of the correlations and the relative ranking of the countries in terms of price similarity.

⁷ We have also calculated price similarity indices weighting the various product categories by their respective OECD-average expenditure shares. For all products, the degree of price similarity is slightly lower for the expenditure weighted results, indicating that price similarity is lower for those products for which expenditures are relatively high.

Table 1.1. Price similarity for some categories of products

21. Regulatory barriers to trade and investment can be powerful obstacles to cross-border competition and may therefore contribute to explain price disparities, even within the Single Market. Therefore, we present in Table 1.2 similarity indices according to the degree of non-tariff barriers (NTB), using the CEC (1997a) classification of products into high, medium and low NTB⁸. The results show that prices within the EU are now relatively similar using this product categorisation, while differences in prices between high and low-NTB products remain significant in non-EU countries. A counter-intuitive result is that, especially in the EU, price similarity is higher for the medium NTB-category than for the low NTB-category. This may be due to the fact that markets characterised by medium NTB's are mainly equipment goods markets which show a higher similarity of prices due to their highly traded nature (see also Table 1).

Table 1.2. Price similarity according to NTB categories

22. Turning now to price convergence, we observe that over the 1985-1996 period, price similarity among EU countries has increased significantly in consumer goods and, especially, in services, while disparities have increased in construction and energy. More importantly, the overall increase in price similarity, as well as the increase in consumer goods and services, was higher in the EU than elsewhere. Price similarity among other OECD countries also increased substantially over the same period, but only in construction and equipment goods (where initial disparities were largest both in absolute terms and relative to the EU). While both EU and other OECD countries made significant progress in the area of non-tradeables, convergence in tradeables was significantly stronger among EU countries. Finally, significant progress towards price similarity has been achieved in the EU for both high and low-NTB sectors, while the other OECD countries mainly achieved progress in the high and medium NTB sectors⁹. These results suggest that the Single Market programme successfully increased EU market integration and

⁸ Information on NTB's in the late 1980s and early 1990s was gathered by CEC (1997a) drawing on a questionnaire among 11,000 European enterprises and a horizontal study of technical barriers in six industries. The information was used to classify all industrial sectors into three groups according to the overall impact of NTB's. Among the 113 traded goods sectors, 18 belong to a high NTB industry (e.g. those where the public sector is a major purchaser) and 35 to a medium NTB industry (e.g. due to differences in standards or administrative and technical controls).

⁹ The results for non-EU countries should be interpreted with caution as the NTB-classification was derived for EU sectors only.

succeeded in reducing price disparities in those markets which were more regulated at the start of the programme.

23. It is noteworthy, however, that price convergence in the EU mainly occurred in the 1990-1993 period, coming to a halt in virtually all categories of products after 1993. By contrast, prices in other OECD countries continued to converge, although at a slow pace. Can this wiggling convergence pattern be explained by the fact that initial price structures were already quite similar in EU countries at the beginning of the period, reducing the potential for further convergence? Or is it the result of a tension between the process of adjustment set in motion by private agents in anticipation of the 1992 Single Market and the persistence of significant policy and regulatory barriers to competition standing in the way of full market integration?

24. The respective roles of initial conditions and EC integration and liberalisation programmes can be partially elucidated by looking at the determinants of price convergence in a multivariate framework. To this end, for each couple of EU and other OECD countries, we model changes in bilateral price similarity as a function of initial bilateral similarity levels, bilateral trade intensity, the bilateral correlation between expenditure shares, a dummy for EU membership and a series of other dummies identifying basic product headings, tradeability and the NTB classification¹⁰.

25. The degree of price similarity at the start of the period is included to measure a “catch-up” effect occurring either because price levels in more highly developed countries tend to be relatively high¹¹ or because in countries which already have similar prices, relatively more far-reaching and difficult reforms have to be implemented to achieve further progress. We therefore

¹⁰ The general form of the estimated equation is:

$$sim_t - sim_{t-k} = a_1 sim_{t-k} + a_2 trade + a_3 share + a_4 EU + a_5 dummy + const.$$

where the dependent variable is the change in the (weighted or unweighted) price similarity of the price structures of two countries ($3 \leq k \leq 11$), “similarity_{t,k}” is the degree of price similarity between the two countries at the start of the period, “trade” is a measure of the bilateral trade intensity, “share” is a measure of the bilateral correlation between expenditure shares, “EU” is a dummy which has the value one if both countries are part of the EU and zero otherwise, “dummy” is a dummy variable measuring the effect of the kind of product (consumer goods, energy, services, construction, and equipment goods), the level of NTB’s (high, medium or low) and the tradability of the product (tradable versus non-tradables) and “c” is a constant.

¹¹ This can be attributed to the (Baumol-) effect of lagging productivity growth in services: countries with a higher living standard (which generally coincides with a higher share of the service sector) tend to have a relatively high aggregate price level.

expect the coefficient of this variable to have a negative sign. The EU-dummy is included to test whether, once controlling for initial conditions and other factors affecting the speed of convergence, prices have converged at a significantly higher rate among EU-countries than among non-EU countries¹².

26. Other factors potentially affecting the speed of convergence can be motivated as follows. The bilateral trade intensity variable (the sum of the bilateral imports, scaled with the sum of the bilateral GDPs) should catch the effect of bilateral trade relations on price convergence. Countries having intense trade relations are expected to be able to reach a higher degree of price similarity (e.g. due to price arbitrage) than countries which do not have such relations. The trade variable can also be seen as a proxy for such issues as relative distance, transport costs and even cultural differences which may also act as trade barriers.¹³ The bilateral correlation between expenditure shares is used to control for the effect of differences in consumer preferences. For example, prices in one country may be higher simply because consumers have a relatively high demand for a particular product variety which is relatively expensive. Demand may be relatively inelastic, allowing producers to earn a relatively high profit margin. Including the correlation between the expenditure shares should (at least in part) correct for these effects. However, it should be noted that a low correlation in expenditure shares between countries may also be the result of a lack of competition in one of the two countries and/or regulatory or other barriers preventing price arbitrage. In any case, we expect a positive sign for this variable. Finally, the dummy variables for the different product categories are included to control for the types of products (consumer goods, energy, services, construction, and equipment goods), the level of NTB's (high, medium or low) and the tradeability features (tradeable versus non-tradeables).

27. The results of cross-section OLS estimation of this equation using as the dependent variable the average change in (both unweighted and weighted) similarity over the 1985-1996 period are shown in Table 1.3¹⁴. Each column shows a different specification of the equation:

¹² In the last section of this report, we investigate whether EU-countries participating in a stable exchange rate area have displayed a significantly different pattern of price convergence compared to other EU countries.

¹³ We use the logarithm of this variable since it displays a considerable variance, ranging from almost zero (e.g. between Australia and Greece) to 7,1% for the trade between Belgium and the Netherlands. Data on aggregate bilateral trade flows refers to 1990 and 1994. Thanks to Harry Oldersma of the Netherlands ministry of Economic Affairs for providing these data.

¹⁴ Luxembourg is excluded in the regressions due to lack of trade data.

columns 1 and 3 present the basic equation with unweighted and weighted similarity indices, respectively; column 2 and 4 check the contribution of each basic heading category to convergence (in unweighted and weighted terms, respectively); columns 5 and 6 check the contribution of NTB levels and tradeability to convergence (on unweighted indices); columns 7 and 8 check how the contribution of the EU changes when the dependent variable is restricted to tradeables or non-tradeables only; and column 9 restricts the estimate to the 1993-1996 period.

Table 1.3. Bilateral convergence equations

28. On the whole, the following conclusions can be drawn from the analysis. As expected, the level of price similarity in 1985 has a significant negative effect on the increase in similarity. This effect proves to be particularly robust across all types of specifications and provides evidence for the catch-up hypothesis¹⁵. Countries with relatively dissimilar price structures have therefore tended to achieve much more progress in price convergence than countries which already had a high level of similarity. Although not always significant, the intensity of bilateral trade relations plays a similar role: countries with intensive bilateral trade relations tend to show relatively little price convergence, because their level of similarity is generally high and, possibly, regulatory barriers impede further convergence. The bilateral correlation between the expenditure shares (an indicator of closeness of preferences) is also significant and correctly signed in most specifications. The overall explanatory power of the weighted specifications tends to be slightly weaker, which may be due to the fact that the weights themselves are influenced by factors not included on the right hand side (such as collusive behaviour or regulatory barriers). As far as product categories are concerned, the results confirm that:

- Price convergence in equipment goods is significantly higher than for consumer goods, whereas performance in the energy sector and in services is lagging behind;
- High- and medium-NTB sectors have been able to achieve a more significant increase in price similarity compared to the low NTB sectors; however, equality of the coefficients estimated high and medium NTB levels

¹⁵ Using the logarithm of the initial similarity level produces the same qualitative results.

cannot be rejected at the 5% level, indicating that after controlling for other factors, no significant differences in price convergence have occurred between high and medium NTB sectors;

- Once we correct for the effect of catch-up and EU-integration, prices of non-tradable goods do not seem to have converged significantly more than those of tradable goods; indeed the reverse seems to be true within the EU.

29. Most importantly, the EU dummy is highly significant in all specifications indicating that, even after controlling for initial similarity levels and other factors, prices have converged more rapidly in the EU than elsewhere. Moreover, this phenomenon appears to have persisted even in the most recent period, in contrast with the univariate findings of Table 1.1. Looking at the various sub-periods (1985-1990, 1990-1993 and 1993-1996) together, we find that the EU-dummy is significant in ten out of twelve cases. Only for the specification tradables-non-tradables, we find no significantly larger price convergence among EU countries than among other OECD countries during the periods 1985-1990 and 1993-1996, providing partial support for the results in Table 1.1. Finally, in those cases where the EU dummy is significant, the coefficient tends to be the lowest for the sub-period 1993-1996, again providing some evidence that the rate of price convergence has declined in recent years. Overall, the evidence on price convergence within the EU in the most recent period is mixed, but it appears safe to say that progress in price convergence slowed down relative to convergence among other OECD countries.

Price levels and profit margins

30. Even though price structures are increasingly similar in the EU, aggregate indicators of the level of product prices suggest that price disparities are still significantly larger and price levels are on average higher than in the US (Table 1.4)¹⁶. The cross-country comparison of prices at a more disaggregated level provides broadly the same picture: with the exception of Southern Europe, product prices in EU countries are generally substantially higher than in North America both in manufacturing and service industries (Figure 1.1). Some of the cross-country price

¹⁶ CEC (1999b) report that price disparities (as measured by the coefficient of variation) are about 40% higher in the EU than in the United States.

differences may be explained by differences in indirect taxation, as the spread in aggregate net-of-tax price levels is somewhat smaller. Moreover, differences in price levels across the EU may also be partly explained by differences in GDP per capita. Indeed, preliminary regressions show that up to 47% of the variation in aggregate price levels (excluding taxes) in the EU can be explained by differences in (the logarithm of) GDP per capita. Probably due to lagging productivity in services, countries with a relatively higher living standard (and a higher share of the service sector) tend to have a relatively higher price level. However, the US performance shows that this cannot be the whole story as aggregate prices are 15% lower in the US than in Europe, whereas GDP per capita is substantially above the EU average. Altogether, the evidence on aggregate and industry-specific price levels suggests that market integration and product market competition is still insufficient in the EU.

Table 1.4. Price levels and standards of living

Figure 1.1. Comparative price levels in manufacturing and services

31. Increasing competition within Europe should also lead to changes in price-cost margins and a downward convergence in mark-ups (Van Bergeijk and Haffner, 1996, Chapters 3 and 4). The mark-up of product prices over marginal costs can therefore be seen as an indicator of the intensity of product market competition. Unfortunately, measuring mark-ups is problematic because marginal costs are difficult to observe. In addition, a lack of competition may also result in relatively high costs, due to rent sharing with employees or other inefficiencies. In spite of these difficulties, a number of measures have been developed which may provide a crude indication of the level and change in mark-ups over time. For example, CEC (1997b) estimate the effect of the single market programme on margins. Price-cost margins are found to be declining across sectors and across countries in the period 1985-1992 (the reduction varying between 0.2 and 0.8% annually, depending on the margin definition used). Assuming that these changes can be attributed to changes in policies, the results may be taken as evidence that the single market programme has had a significant cumulative impact on price-cost margins in the EU. However, alternative estimates of margins by Oliveira-Martins *et al.* (1996) lead to somewhat different conclusions (Table 1.5). Average mark-ups within the EU tend to be higher than in the US in both manufacturing and service sectors and no generalised decline can be observed in the spread of mark-ups in three-digit manufacturing industries over the 1970-1980 and 1980-1992 sub-periods.

For example, mark-ups are rising in Germany, where mark-ups in manufacturing are already above average, while they are declining in countries where mark-ups are already relatively low, such as the UK and France. By contrast, mark-ups declined in the US over the same period.

Table 1.5. Average mark-ups for selected sectors

32. The table also shows that cross-country differences in mark-ups are especially high in sheltered industries, such as electricity, gas and water and in the wholesale and retail sector. In the transport and construction sectors, spreads in mark-ups are lower, but still substantially higher than in the manufacturing sector. Taken together, these figures confirm the results of the previous section, indicating that the level of price similarity and the degree of competition in sheltered sectors such as services and energy (but also construction) displays considerable differences. Even in more integrated markets such as manufacturing, convergence is far from complete.

Table 1.1. Price similarity for some categories of products, 1985-1996

	1985	1990	1993	1996	Change 1985-1996
EU					
All products	81,9	81,5	84,5	84,6	+2,6
Consumer goods	82,9	82,2	86,0	85,9	+3,0
Equipment goods	88,5	88,1	88,6	89,8	+1,2
Construction	85,3	85,0	85,9	84,8	—0,5
Services	75,2	76,1	79,4	79,5	+4,2
Energy	84,1	78,3	77,2	79,1	—5,0
Tradables	83,9	83,1	86,1	86,3	+2,4
Non-tradables	76,7	77,2	80,3	80,6	+3,9
Other OECD					
All products	75,3	78,2	75,7	76,4	+1,1
Consumer goods	77,1	79,9	76,9	76,7	—0,4
Equipment goods	80,0	80,7	82,0	85,7	+5,6
Construction	70,9	81,4	75,8	79,3	+8,4
Services	69,2	72,7	70,2	71,0	+1,8
Energy	76,1	73,4	71,0	72,3	—3,9
Tradables	77,4	79,8	77,5	78,0	+0,6
Non-tradables	69,8	74,3	71,0	72,6	+2,8

EU = Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, Sweden and the United Kingdom.

Other OECD = Australia, Canada, Japan, Norway, New Zealand, Turkey and United States.

Table 1.2. Price similarity according to NTB categories, 1985-1996

	1985	1990	1993	1996	Change 1985-1996
EU					
High NTB	82,0	81,3	85,1	85,5	+3,5
Medium NTB	88,0	86,8	88,1	88,5	+0,5
Low NTB	82,2	81,9	85,9	85,8	+3,6
Other OECD					
High NTB	76,7	80,4	78,9	81,3	+4,6
Medium NTB	76,7	77,2	80,3	80,6	+3,9
Low NTB	76,4	79,1	76,7	76,2	—0,3

EU = Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, Sweden and the United Kingdom.

Other OECD = Australia, Canada, Japan, Norway, New Zealand, Turkey and United States.

Table 1.3. Bilateral convergence equations

Dependent variable	Change in price similarity (average 1985-1996)								
	1	2	3	4	5	6	7	8	9
Specification/ Independent variables	Unweighted		Weighted		Unweighted				1993-1996
<i>Similarity 1985</i>	-0,3 (-6,9)	-0,5 (-20,0)	-0,3 (-5,4)	-0,5 (-21,1)	-0,6 (-21,0)	-0,3 (-9,5)	-0,5 (-8,1)	-0,2 (-6,1)	-0,3 (-12,9)
<i>Trade intensity</i>	-0,3 (-1,4)		-0,6 (-2,1)						
<i>Expenditure share</i>	1,4 (1,2)	1,5 (2,0)	3,8 (2,6)	3,1 (3,5)	4,0 (3,8)	3,6 (2,1)	0,8 (0,3)	6,6 (2,9)	3,3 (5,7)
<i>EU-dummy</i>	3,9 (6,6)	2,7 (6,6)	3,7 (5,3)	3,6 (7,4)	4,5 (12,5)	3,1 (6,7)	4,6 (8,1)	2,6 (3,4)	1,2 (3,8)
<i>Construction</i>		-0,4 (-0,6)		-0,8 (-1,0)					1,2 (2,3)
<i>Equipment goods</i>		3,2 (5,1)		3,9 (5,1)					3,3 (6,7)
<i>Energy</i>		-6,3 (-10,4)		-5,0 (-6,9)					-0,2 (-0,3)
<i>Services</i>		-2,6 (-4,0)		-2,1 (-2,6)					-1,5 (-3,0)
<i>High NTB</i>					2,2 (5,3)				
<i>Medium NTB</i>					1,5 (3,6)				
<i>Tradable</i>						0,5 (0,9)			
<i>constant</i>	24,2 (6,6)	39,2 (19,7)	17,6 (4,7)	42,3 (19,1)	46,7 (21,3)	21,6 (9,9)	38,6 (10,1)	16,1 (5,5)	23,4 (6,5)
<i>Observations</i>	210	1050	210	1050	630	420	210	210	1050
<i>F-statistic</i>	20,2	88,3	15,0	82,3	105,1	27,7	40,5	14,4	33,4

Notes: Specifications 3 and 4 use the expenditure weighted change in price similarity as dependent variable (and also the weighted similarity 1985 as independent variable); specification 7 is for tradables only, whereas specification 8 is for non-tradables; specification 9 is for 1993-1996. T-statistics in parentheses.

Table 1.4. Price levels and standards of living (1996, EU15=100)

Country	Aggregate price level (including tax)	Aggregate price level (excluding tax)	GDP per capita
Austria	110	108	113
Belgium	102	100	113
Denmark	123	117	116
Finland	109	108	95
France	110	107	104
Germany	115	115	110
Greece	76	82	68
Ireland	92	93	95
Italy	88	87	104
Luxembourg	110	108	162
Netherlands	104	106	104
Portugal	68	74	70
Spain	83	87	78
Sweden	123	119	100
UK	86	87	98
USA	85	NA	146

Source: CEC (1999b) and OECD (1999).

Table 1.5. Average mark-ups for selected sectors, 1980-92^a

	Manufacturing (level and tendency) ^b		Electricity, gas and water	Construction	Wholesale, retail, restaurants and hotels	Transport, storage and communication
<i>EU-members</i>						
Belgium	1,17	↑	1,52	1,26	1,80	1,68
Denmark	1,15	↑	1,36	1,09	1,64	1,29
Finland	1,24	↓	1,29	1,19	1,24	1,36
Netherlands	1,21	↓	1,25	1,06	1,45	1,45
Sweden	1,16	↓	2,07	1,12	1,16	1,20
Germany	1,21	↑	1,39	1,23	1,34	1,35
France	1,16	↓	1,50	1,19	1,48	1,39
Italy	1,18	↑	1,28	1,39	1,96	1,37
UK	1,15	↓	1,34	1,25	1,37	1,25
<i>Non-EU</i>						
Australia	1,20	↑	1,55	1,28	not sign.	1,47
Norway	1,18	↓	1,56	1,09	not sign.	1,25
USA	1,15	↓	1,34	1,17	1,25	1,33
Japan	1,26	↑	1,58	1,26	not sign.	1,29
Canada	1,20	↓	2,54	1,16	1,28	1,37
Spread	0,11		1,29	0,22	0,8	0,48
(max—min)						

Source: Martins, Scarpetta and Pilat (1996).

^a Estimates are adjusted for material inputs and are net of net indirect taxes. Average for manufacturing based on ISIC 3-digit sectoral mark-ups (weighted by 1990 production shares). ^b Tendency based on comparison of sub-periods 1970-80 and 1980-92.

SECTION 2

COMPETITION AND LABOUR MARKET PERFORMANCE: SOME THEORETICAL CONSIDERATIONS

33. As discussed in the previous section, despite the operation of the free trade area and the single market, firms in the European countries are likely to still enjoy significant market power and this is related (see also next section) to the persistence of strict regulations on entry in domestic markets and non-tariff barriers to trade and investment. This section provides some theoretical underpinning to the relationships between product market competition, regulations and economic performance, while the following section offers some empirical evidence on these relationships.

34. The general consensus among economists and men of affairs is that monopoly power undermines economic performance. We consider a number of channels through which this could occur. First, we look at the direct effects via labour demand and wage determination, analysing the partial and general equilibrium effects on wages and employment. Second, we investigate the impact of product market competition on the responsiveness of wages and prices to market conditions and thus on the response of employment to macroeconomic shocks. Finally, we consider briefly the effect of product market competition on various labour market institutions.

The Impact of Product Market Competition on Wages and Employment

35. The purpose in this section is to analyse the role of product market competition in the long-run determination of wages and employment, both at the firm and aggregate levels. We begin by looking at labour demand.

Product market competition and labour demand

36. An increase in product market competition will typically affect labour demand in two ways. First, it will tend to make labour demand more elastic with respect to the wage. This comes about because a rise in product market competition is typically associated with a rise in the elasticity of product demand facing the firm. It immediately follows that the wage elasticity of the derived demand for labour also rises (see Hicks, 1932, Appendix). The second effect is simply to shift the demand for labour schedule outwards because the rise in the product demand elasticity raises the marginal revenue product of labour at given wages.

37. To illustrate these effects, consider a simple model where firm i has a Cobb-Douglas production function and faces a constant elasticity labour demand curve. So we have

$$\text{production : } Y_i = N_i^a K_i^{1-a} \quad (1)$$

$$\text{demand : } Y_i = P_i^{-\eta} Y_{di} \quad (2)$$

where Y is valued-added output, K is the (fixed) capital stock, P is the real price of the firm's value-added (relative to the price of GDP), Y_d is a demand index.

38. To maximise profits, the firm sets the marginal revenue product of labour equal to the wage to obtain:

$$\kappa P_i K_i^{1-a} N_i^{a-1} = W_i \quad (3)$$

where $\kappa = (1-1/\eta)$, which serves as our indicator of product market competition (note κ^{-1} is the mark-up of price on marginal cost).

39. Equations (1), (2), (3) then determine P_i , Y_i , N_i at the level of the firm. The solution for employment has the form

$$N_i / K_i = \left(w_i K_i^{1/h} / a k Y_{di}^{1/h} \right)^{-1/(1-\alpha\kappa)} \quad (4)$$

and reveals that the wage elasticity is $(1 - \alpha\kappa)^{-1}$, which is increasing in κ , and further that a rise in κ raises the right-hand side of (4) and hence shifts the firm's labour demand outwards. These outcomes are important for the determination of both wages and employment, as we shall see in subsequent sections.

Product market competition, wage and employment determination: partial equilibrium

40. The question that needs to be addressed at this stage is whether firms with market power will pay higher wages or not. Market power generates monopoly rents and these may be captured by the employees in the form of higher wages. If the labour market is perfectly competitive and the firm takes wages as given, this rent capture obviously does not occur. So if wages are to be influenced by market power, then wage determination must be non-competitive. It should be stressed that we are not, at this point, concerned with the impact on wages if the market power of all firms in the economy changes. In this case, it is possible for wages to shift even if the labour market is perfectly competitive.

41. If we assume that wages in the firm are bargained collectively, then, more or less whichever model of union bargaining one takes, it turns out that the bargained wage is decreasing in the elasticity of labour demand. Basically, the higher the labour demand elasticity, the bigger the adverse impact on both employment and profits of any rise in wages. This naturally leads to a lower bargained wage. For example, in the model of the previous section, if v is the labour demand elasticity (note $v > 1$), the elasticity of profits with respect to wages is $-(v - 1)$. And then if we suppose a simple Nash bargaining model where the firm contribution to the Nash object is profits, Π_i , and the union contribution is $(W - A)N_i$, A being the alternative reward available in the outside labour market, the mark up of the bargained wage over A is given by $(2v-1)^{-1}$. More general models have much the same implications (see, for example, Dowrick, 1989 or Layard et al. 1991, Ch. 2). So, as a general conclusion, it is safe to argue that if a single unionised firm faces increased product market competition, its labour demand elasticity will tend to rise and its bargained wage will tend to fall. Given both the fall in the wage and the outward shift in the

labour demand curve mentioned in the previous section, employment in the firm may also be expected to rise (at a given level of capital).

42. So if wages are bargained collectively within a firm, we may expect a rise in product market competition to lead to the firm paying lower wages and employing more workers. Since most workers in Europe are covered by collectively bargained wages, this is the most relevant framework. However, it is worth investigating whether the same outcome rises in firms where wages are set unilaterally by managers, as in the efficiency wage model.

43. In fact, in most standard forms of efficiency wage model, the wage outcome is independent of the market power of the firm. For example, consider the standard effort model where real revenue is $R(E_i, N_i)$, E_i being effort. Then if effort depends on wages relative to outside opportunities, so $E_i = e(W_i/A)$, $e' > 0$, wages are determined by the Solow condition

$$e(W_i/A) = e'(W_i/A)W_i/A \quad (5)$$

This implies that wages are fixed mark-up on outside opportunities with the mark-up depending only on the arguments of the effort function.

44. Similarly, efficiency wage models which assume that higher wages are paid to reduce the costs of quitting (or the costs of turnover more generally) lead to wages being a mark-up on outside opportunities, with the mark-up depending only on the arguments of the quit or turnover functions. For example, in models of the Shapiro-Stiglitz (1984) type, the firm's wage is based on the *no shirking condition* and depends on outside opportunities and the factors determining the monitoring technology. In none of these cases does there appear to be any obvious mechanism by which the market power of the firm can enter the story. However, even in this contest, there are two, possibly remote, cases in which firms might choose to pay higher wages when they have market power and are earning higher monopoly rents. First, the effort function may depend negatively on the level of market power, and workers will put less effort in the production activity if they do not share in the monopoly rents. The second alternative is that managers, enamoured as they are of a quiet life, spend part of the monopoly rents on higher wages in order to make their lives more peaceful. This is an aspect of expense-preference theory (see Smirlock and Marshall, 1983) and requires the existence of some mechanism whereby managers can act against the best interests of shareholders.

45. To summarise our conclusions so far, it is perfectly plausible that in firms where wages are bargained collectively, an increase in product market competition will tend to lower wages and raise employment in the firm. However, in firms where wages are determined competitively or are set by managers, this outcome is far less likely. These are partial equilibrium results. So what happens if all firms in the economy face an increase in product market competition?

Product market competition, wage and employment determination: general equilibrium

46. As argued above, at the firm level it is natural to think that an increase in product market competition leads to a fall in wages and, *ceteris paribus*, an increase in employment. And the amount by which employment increases depends on the labour demand elasticity. However, it is sometimes argued that in a world of unionised firms where the unions bargain over employment as well as wages, if there is a general rise in product market competition the loss of rents would be shared by the firms and workers with no overall impact on employment (see Geroski et al., 1997, for example). This argument can be readily dismissed. In a general equilibrium framework, the outside option, A , becomes endogenous. Thus, as Layard and Nickell (1990) demonstrate, the equilibrium unemployment rate in a world where unions bargain of wages and employment can be either lower or higher than that where unions bargain only over wages and the firm sets employment. Indeed, in a Cobb-Douglas, constant elasticity world, equilibrium employment is exactly the same in both cases. Furthermore it is decreasing in union power and increasing in product market competition (see also Gersbach, 1998).

47. Another interesting general equilibrium question concerns the impact on wages of a universal increase in product market competition throughout the economy. While at the individual firm level, an increase in product market competition can lead to a reduction in wages, this is not likely to occur in case of an economy-wide increase in competition. Product market competition reduces wages relative to the outside option, but a universal rise in product market competition (rise in demand elasticities) also raises aggregate labour demand via the outward shifts of the firm labour demand curves. This leads to a large initial fall in unemployment which drives up wages across the board and in the new equilibrium, while unemployment is somewhat lower, labour demand is high enough to imply higher wages and lower profits. So while a rise in product market competition at the individual firm level can be detrimental to workers in that firm,

an overall rise appears to benefit all the workers in the economy¹⁷ by raising both employment and wages.

The Impact of Product Market Competition on Macroeconomic Stability

48. The previous section focused on a comparative static analysis in which we assumed an exogenous change in product market competition. However, labour and product market dynamics are also important. The basis idea is that the product market competition affects the way in which both prices and wages respond to market pressures and, in the presence of rigidities in the labour market, a slower adjustment of prices and wages may transform cyclical variations in unemployment and employment into structural changes.

49. Concerning price-setting, it is a well known result that demand effects on prices tend to be stronger if firms operate in a more competitive environment (see, for example, Encaoua and Geroski, 1986, or Brack, 1987). Similarly, on the wages front, a higher degree of product market competition will reduce the power of insiders in wage bargaining is reduced and thus outside conditions will have a greater impact on the wage bargain (see Layard et al. 1981, Ch. 4). In order to see how this could affect macroeconomic stability and labour market performance we focus on a simple macroeconomic model. Consider the following long-linear model:

$$\begin{aligned}
 \text{Aggregate demand} & \quad y = m - p \\
 \text{Production (Okun's law)} & \quad y = -u \\
 \text{Price-setting} & \quad p - w = b_o + b_{1y} + b_{11} \Delta y - b_2 (p - p^e) + z_p \\
 \text{Wage-setting} & \quad w - p = g_o - g_1 u - g_{11} \Delta u - g_2 (p - p^e) + z_w
 \end{aligned}$$

y = deviation of real output from trend, m = money stock, p = price level, u = unemployment rate, z_p = supply shocks to prices, z_w = supply shocks to wages. This is a standard framework which is explained in detail in Layard et al. (1991), Ch. 8. The key parameters are β_2 , γ_2 which capture the extent of nominal inertia (price-wage stickiness), β_{11} , γ_{11} which reflect the temporary impact of market tightness on prices and wages and β_1 , γ_1 which capture the permanent effect of market

¹⁷ However, in Gersbach (1998), a model is presented where more intensive product market competition widens the wage differential between skilled and unskilled workers.

tightness on prices and wages. These two latter parameters are positively influenced by the extent of product market competition.

50. In order to analyse macroeconomic stability in the context of this model we suppose that it is subject to the following shocks:

$$\begin{aligned} \text{money supply, } m &= m_{-1} + \varepsilon_m \\ \text{supply shocks, } z_p &= \bar{z}_p + e_p; z_w = \bar{z}_w + e_w \end{aligned}$$

Where $\varepsilon_m, \varepsilon_p, \varepsilon_w$ are iid random variables. Then if we define equilibrium unemployment, u^* , as the value for u for which $\Delta u = 0, p - p^e = 0, \varepsilon_p = \varepsilon_w = 0$, we find

$$u^* = (b_o + g_o + \bar{z}_p + \bar{z}_w) / (b_1 + g_1)$$

51. It is then possible to show that under rational expectations, the response of unemployment to the various shocks is given by:

$$\begin{aligned} (u - u^*) &= \frac{b_{11} + g_{11}}{b_1 + g_1 + b_{11} + g_{11}} (u_{-1} - u^*) + \frac{e_p + e_w}{\Delta} - \frac{(b_2 + g_2)}{\Delta} e_m, \\ \Delta &= b_2 + g_2 + b_1 + g_1 + b_{11} + g_{11} \end{aligned}$$

52. So, if β_1 and γ_1 are increasing in product market competition, then we find that a rise in product market competition will: a) reduce the real impact of all the shocks, since Δ is increasing in β_1 and γ_1 ; and b) reduce the degree of persistence of all the shocks, since the coefficient on the lagged dependent variable is decreasing in β_1 and γ_1 .

53. To summarise, therefore, it is plausible that a rise in product market competition increases the stability of the macroeconomy by reducing the impact of both demand and supply shocks and by lowering the persistence of these shocks (see Section 4). In turn, stable macroeconomic conditions are likely to contribute to falling unemployment in countries with rigidities in the labour market where increases in unemployment which are initially cyclical tend, over time, to become structural¹⁸. Indeed, across countries

¹⁸ This would also occur if the impact of unemployment on wage inflation is non-linear (the "Phillips curve"). For example, if changes in inflation are driven by the difference between the log of unemployment and the log of the natural rate, the average level of unemployment will be larger the greater the variance of unemployment, even if the log of unemployment is on average equal to the log of the natural rate. Indeed, if $(\log u - \log u^*)$ is normally distributed with mean zero and variance 2, then the expected value of u is: $E(u) = \exp(\log u^* + \frac{1}{2}\sigma^2)$. Turner (1995) presents estimation results which suggest that, for three of the G7 countries, the inflationary effects of a positive output gap (output being above trend) are much bigger than the dis-inflationary effects of a corresponding negative output gap.

there is a positive correlation between the degree of annual volatility of unemployment and the extent of the rise over time in structural unemployment (Elmeskov et al., 1998).

Product market competition and self employment

54. In the previous section, the analysis was exclusively concerned with dependent employment. The relationship between product market competition and self employment is rather different. In so far as increases in product market competition arise from reductions in product market regulations, then increases in self-employment may well follow as a symptom of the rise in product market competition. The mechanism is straightforward. Product market regulations, in the form of regulatory and administrative barriers, are likely to inhibit the creation and development of new business and so impede the growth of self-employment. It is, however, worth noting that the overall competitive stance in the product market results from different combinations of product market regulations and these different combinations may significantly affect the composition of dependent and independent employment. If, as is often the case, product market, and indeed employment protection, regulations are relatively less onerous for very small firms, this will encourage self-employment and the extent of this encouragement will be reduced if these regulations are eliminated.

Product Market Competition and Labour Market Institutions

55. Market structure and competition are likely to interact with regulations in the labour market. When firms face more competition, they are under pressure to respond more rapidly to fluctuations in the markets in which they operate. Furthermore, as we have already seen, they have fewer monopoly rents to distribute to their employees in the form of higher wages or lower effort. This may have consequences for a number of labour market institutions, notably unions, employment protection and unemployment benefits.

56. It is clear that an increase in product market competition will reduce the rewards that unions are able to extract from firms on behalf of their members. This could lead to a fall in membership which would be reinforced if the fall in entry barriers to traditionally unionised sectors led to an increase in the number of new non-union firms. This would be particularly important in those countries where unions are essentially synonymous with their membership, as

in the UK or the US, and have little or no wider social or political role, as in most of Continental Europe. Thus, for example, the sharp decline in union membership in the UK since 1980 has been almost exclusively due to the exit of unionised establishments and the entry of non-union establishments. Changes in the status of continuing establishments from unionised to non-unionised are extremely rare. Another aspect of union wage bargaining that might be influenced by product market competition is the degree of centralisation. Any form of cross-firm co-ordination in wage bargaining is likely to come under more pressure if the firms face higher levels of competition. This is essentially because, as each firm faces more competitive pressure, the likelihood that it will pay a firm to break away from a co-ordinated agreement will surely increase. For example, having a lower wage than that agreed by the group may be the only way of surviving for the less efficient firms. So we might expect to see increasing pressure for decentralised wage bargaining as product market competition increases as well as the possibility of an all round decline in trade unionism.

57. Turning now to employment protection legislation, if increased competition means that firms have to respond more rapidly to shocks, they will press for more flexibility in employment contracts. Workers, on the other hand, will feel that their jobs are less secure and will press for more protection. One way around this would be for governments simultaneously to weaken employment protection legislation and raise the generosity of the unemployment benefit system. This passes on the costs of increased flexibility to the tax-payer. If this hypothesis is correct, we would expect to observe lower levels of employment protection and perhaps higher levels of benefits in those countries which encourage product market competition by having lower levels of product market regulation. The relationship between product market competition/regulatory reforms and EPL works also in the other direction. For example, the existence of thresholds for the application of EPL to collective or individual dismissals may affect the minimum efficient scale of firms (after accounting for the cost of regulations) and favour particular kinds of company structures (such as sole proprietor firms). This effect can be reinforced (or weakened) by a profile of administrative burdens favouring (or discouraging) the creation of individual firms. Therefore, on the whole, different combinations of the regulatory regimes in the labour and product market can be expected to result in different labour market equilibrium configurations, potentially distorting the optimal level and composition of employment (e.g. between dependent and self-employment). At the same time, the effects of regulatory reform are likely to be different

depending on the initial combination of regimes and on the sequencing of the reforms in the two markets.

SECTION 3

THE IMPACT OF PRODUCT AND LABOUR MARKET REGULATIONS ON LABOUR MARKET PERFORMANCE: AN EMPIRICAL INVESTIGATION

58. This section provides some empirical evidence on the relationship between product market competition, regulations and economic performance. It should be stressed at the outset that the degree of product market competition is not observable and the available proxies are often endogenous to the economic performance variables to be explained.¹⁹ In this section, therefore, indicators of performance are directly related to some of the policy determinants of market structure and product market competition, such as regulatory provisions restricting entry and favouring large, possibly state-controlled, incumbents. Moreover, we consider certain regulations in the labour market (the so-called employment protection legislation) that are assumed to affect the behaviour of agents in the product market, interact with product market regulations and affect labour market outcomes.

59. The potential linkages between the regulatory environment in the product and labour markets and outcomes on the labour market are manifold and complex. Product market regulations may affect firm behaviour in three main ways: by increasing the costs of producing any given level of output (e.g. compliance or avoidance costs); by affecting market structure (e.g. legal limitations on the number of competitors); and by changing the incentive structure (e.g. public ownership). In general, the influence of product market regulation will be reflected on

¹⁹ For instance, using industry concentration or mark-ups as measures of market power is misleading since industry-level Herfindhal indices have little meaning in markets open to foreign competition and mark-ups are determined together with wage premia.

labour demand and/or wage determination. Labour market regulations can have a powerful impact on labour market outcomes by changing the set of constraints under which labour demand and supply decisions are taken.

60. This section has two main objectives:

- To assess whether available indicators of product and labour market regulations help to explain cross-country/sector differences in performance in OECD countries; and
- To empirically identify some of the channels through which the impact of regulation on performance may come about.

61. The analysis is based on a novel set of cross-country comparable indicators of regulation in the labour and product markets. These indicators have been constructed by the OECD using data collected from a variety of national and published sources (Box 1).²⁰ Product market indicators provide information on the degree of state control, barriers to entrepreneurial activity and barriers to trade and investment. Labour market indicators provide information on employment protection legislation (EPL) for permanent and temporary workers and on other policies affecting the use of labour (such as the tax and benefit systems) as well as on institutional characteristics of the labour market, such as wage bargaining systems and unionisation. It should be stressed at the outset that these indicators are only rough approximations of the regulatory and institutional stance across OECD countries.

²⁰ The indicators are used in this section under the exclusive responsibility of the authors and do not engage the OECD or its Member countries. Nicoletti and Scarpetta (1999) provide a detailed description of the database and of the methodology followed in the construction of the indicators.

Box 1. A classification of product and labour market regulations

The analysis is based on families of indicators established according to a taxonomy of regulatory interventions in the product and labour markets. The indicators have a pyramidal structure. At the top they summarise the regulatory environment in either the product or the labour market (as far as employment protection legislations are concerned). At the next level they summarise information about broad classes of regulatory interventions (e.g. inward or outemporary work agencyrd-oriented product market regulations, EPL for permanent or temporary workers). At the intermediate and lower levels they summarise information about types of interventions within these broad classes (e.g. state control of business sector activity) as well as their specific modalities (e.g. public ownership or interference in private firms); at the bottom they coincide with individual features of the regulatory egimes (e.g. scope of the public enterprise sector or use of command and control regulations). The bottom level generally corresponds with the basic units contained in the regulation database. To minimise discretion in the weighting procedures, the summary indicators were constructed aggregating their lower-level components by means of factor analysis techniques. Aggregation through factor analysis ensures that the weights assigned to the detailed indicators depend on the contribution of each indicator to the explanation of the total variance in the data. As a result, the amount of variance explained by the summary indicators is maximised. Up to 70 indicators on specific regulatory measures were used in the construction of the overall product and labour market indicators. All indicators were ranked on a 0-6 scale going from least to most restrictive regulatory environments. See Nicoletti and Scarpetta (1999) for more details on the methodology used to construct the summary indicators.

The following hierarchy of indicators was established:

Product market regulation

Inward-oriented policies

State control

Public ownership

- Size of public enterprise sector*
- Scope of public enterprise sector*
- Control by legislative bodies*

Interference in private firms

- Special voting rights*
- Use of command and control regulation*

Barriers to entrepreneurship

Administrative transparency

- Licenses and permits system*
- Existence of simplification programs*
- Communication and enforcement of procedures*

Adm. burdens on business startups

- Adm. burdens for corporations*
- Adm. burdens for sole proprietor firms*

Legal barriers to entry

Outward-oriented policies

Barriers to trade and investment

Regulatory and tariff barriers

- Regulatory barriers*
- Tariffs*

Other trade barriers

- Non-tariff barriers*
- Ownership barriers*
- Discriminatory procedures*

Employment protection legislation

EPL for permanent workers

Regular procedural inconveniences

- Procedures*
- Delay to start a notice*

Notice and severance pay

- Notice period*
- Severance pay*

Difficulty of dismissal

- Definition of unfair dismissal*
- Trial period*
- Difficulty at 20 years tenure*
- Reinstatement obligations*

EPL for temporary workers

Fixed-term contracts

- Valid dismissal other than "objective"*
- Max. n. of successive contracts*
- Max. cumulated duration*

Temporary work agency employment

- Types of authorised work*
- Restrictions on n. of renewals*
- Max. cumulated duration*

62. It is important to note that, with a few exceptions, the indicators of product market regulation are currently available only at the nation-wide level and for a single year (1997 or 1998, depending on the indicator). This makes it impossible to relate labour market outcomes to the evolution of the regulatory environment over time and to observed differences in sectoral product market regulations, somewhat constraining the empirical analysis. On the other hand, more information on time patterns of labour market regulations and institutions is available, although full time-series are often lacking. Specifically, indicators of EPL exist for the late 1980s and the late 1990s, but these data were supplemented with information about the timing of major reforms in order to construct a time-varying indicator for each country.

Regulation and performance patterns across the OECD

63. Despite regulatory reforms in most OECD countries over the past decade, product market regulations still vary substantially across the OECD. Figure 3.1 shows cross-country differences in the overall regulatory environments and along three axes of regulation: state control, barriers to entrepreneurial activity and barriers to trade and investment. The state control indicator summarises public ownership patterns and command and control measures; the indicator of barriers to entrepreneurship summarises legal and administrative obstacles to entry in product markets, such as limitations on the allowed number of competitors and administrative burdens on the creation of businesses; the indicator of barriers to trade and investment includes tariff and non-tariff barriers as well as legal, regulatory and procedural restrictions on FDI (see Box 1). The highest cross-country variations are found in state control and (although to a lesser extent) in barriers to entrepreneurship, whose most variable component concerns administrative burdens on business startups.²¹ These two indicators are also significantly correlated across countries.²² By contrast, with a few exceptions, countries are more homogeneous in their attitudes towards trade policies, not least because of the different rounds of trade negotiations.

²¹ The average score of the US along this axis of regulatory intervention depends on the relatively high number of administrative procedures and services involved in business startups.

²² The correlation coefficient is 0.5 and is significant at the 5 per cent level.

Figure 3.1. Differences in product market regulations

64. Differences in labour market regulations are equally significant. These regulations are still determined essentially at the domestic level even in the EU, and their convergence across countries can only be induced by market pressures originating from rising economic integration. Figure 3.2 shows the evolution of indicators of EPL for permanent and temporary workers during the past decade. Broadly speaking, there has been a tendency for a significant deregulation of temporary contracts, while only modest changes have been recorded for permanent contracts. Only Finland and Spain have significantly eased regulation for permanent workers. In a number of countries (e.g. Japan, Germany, Italy Belgium, Finland, New Zealand and Sweden) fixed-term contracts can now be used in a wider range of situations than at the beginning of the 1990s. Moreover, in Denmark and Sweden, all restrictions on the types of work for which TEMPORARY WORK AGENCY employment is legal have been removed and in Italy and Spain TEMPORARY WORK AGENCYS have become legal for certain types of work while having previously been illegal in all circumstances.

Figure 3.2. Differences in employment protection legislation

65. Interestingly, restrictive product market environments are matched by restrictive employment protection policies. There is a strong correlation across countries between the overall indicator of product market regulation (including several of the specific regulations described above), and a summary indicator of EPL (including measures for both permanent and temporary workers) (Figure 3.3).²³ This finding tends to confirm the line of reasoning proposed in the previous section concerning the possible linkages between regulatory policies in the two markets. For example, restrictive product market regulations may make it less urgent for entrepreneurs to lobby for and for workers to accept an easing of EPL. On the other hand, by increasing the speed of labour market adjustment, less restrictive EPL may make regulatory reform in the product market easier to implement.²⁴ The strong correlation between regulatory regimes in the labour and product markets also suggests that their influence may have compounded effects on labour market

²³ The correlation coefficient is 0.75 and it is significant at the 1 per cent level.

²⁴ A lax EPL regulation may, however, make workers' resistance to regulatory reform fiercer insofar as insiders would be less protected in the event of redundancies.

outcomes, making regulatory reform in only one market less effective than simultaneous reform in the two markets²⁵. In any event, the high correlation of the summary dimensions of regulation makes it difficult to identify empirically their specific effects on labour market performance.

Figure 3.3. Product and labour market regulation

The impact of regulation on labour market performance

66. As argued above, overly restrictive product market regulations may shift and twist the aggregate labour demand curve possibly leading to lower aggregate employment. Similarly, unduly restrictive EPL can reduce the equilibrium level of employment and affect its dynamics over the business cycle (see Box 2). However, the influence of regulation on the dependent and independent segments of the labour market should also be distinguished. Labour market regulations are likely to have a direct effect on dependent employment, while product market regulations can be expected to affect dependent employment mostly indirectly, through their effect on market structure and product market competition. On the other hand, independent employment may suffer directly from overly restrictive product market regulations, since regulatory and administrative barriers are likely to make the creation and development (and sometimes even exit) of businesses difficult. Labour market regulations may only affect independent employment indirectly, especially when they are asymmetric, as it is the case when regulations apply to workers in firms above an employment threshold, which may encourage the creation of smaller-sized enterprises.

67. Another way to look at the potential effects of regulations on labour market performance is to focus on wages. Regulations on the labour and product markets affect wage formation by creating product market rents that could be eventually shared with employees in the form of high wages. It is, however, difficult to disentangle the effects on wages of product market rents to those stemming from other factors. Labour is not homogeneous and different industries require labour inputs of varying skill levels and other worker-specific characteristics. It is first necessary to adjust for the characteristics of the workforce across industries, although such adjustment is bound

²⁵ See OECD (1999) *The Job Strategy: Assessing Performance and Policy* ; Coe and Snower (1997); and Elmeskov, Martin and Scarpetta (1998) for a discussion of policy interactions.

to be incomplete. If such adjustment still indicates the existence of wage premia, it may be that they arise from “efficiency wages” whereby employers voluntarily pay high wages in order to attract more committed and reliable workers. Higher wage rates are traded off against higher productivity and lower personnel administration costs. In that case, marginal costs in the long run might not be higher than if lower wages were paid to a lower quality workforce. It is therefore also important to determine not only whether or not wage premia exist, but also whether they arise from the sharing of rents arising from imperfect competition, or efficiency wages being paid in an essentially competitive environment. In either case, though, (and the two are not mutually exclusive), there are likely to be interactions with labour markets which will vary in size and severity depending on institutional arrangements regarding wage bargaining and rigidities in labour markets.

68. To test empirically the effects of regulations in the product and labour markets on performance we use simple bivariate correlations and econometric techniques. In the latter case, a two-stage approach has been used based on cross-country and sectoral data. In the first stage, we apply panel data techniques to estimate reduced-form or “structural” models accounting for those determinants of employment and wages for which time-series and/or sector-specific information is available. The aggregate employment equation includes policy and institutional factors as well as the time-varying indicator of EPL. The industry-specific wage equations include only “structural” factors (such as productivity), since no sectoral detail is available for EPL. In the second stage, unexplained country-specific effects are related to the indicators of labour and/or product market regulations. The analysis is performed on a sample of OECD countries (excluding Korea, Mexico and the Central and Eastern European members, for which time-series data was lacking or unreliable) over the 1982-1995 period. Cross-sector estimates are based on a panel of 11 manufacturing and non-manufacturing industries (at the two-digit level) and 4 service industries (at the one-digit level).

69. The two-stage approach has the advantage of making the best use of the available information. The first stage exploits the cross-country, time-series -- and for the wage equation the cross-industry -- dimensions and makes it possible to identify the part of labour market performance that can be explained by available structural indicators. The second stage relates the unexplained cross-country component to labour and/or product market regulations, for which only the economy-wide and cross-sectional information is available.

70. To assess empirically the impact of regulations in the labour and product markets on the composition of employment we look at the share of self-employment in total employment in the overall business sector as well as in industry and services.²⁶ In this context, a single-stage approach seemed to be more appropriate, since the focus is on the determinants of cross-country differences in the long-run composition of employment, which are unlikely to be affected in the short run by changes in regulations.

Box 2. Employment protection legislation and labour market performance: empirical evidence

In all OECD countries, there are rules and regulations that govern the employment relationship between workers and firms. Those referring to hiring and firing practices are often referred to as "employment protection" legislation (EPL). These rules and regulations govern unfair dismissals, restrictions on lay-offs for economic reasons, compulsory severance payments, minimum notice periods and administrative authorisations.

The EPL regulations may affect the equilibrium level of employment -- as well as its dynamics over the business cycle -- in different ways. By reinforcing job security, EPL may enhance productivity performance, as workers will be more willing to co-operate with employers in the development of the production process (Akerlof, 1984). Moreover, to the extent that EPL leads to long-lasting work relationships, it may encourage employers to provide training to workers with potentially beneficial effects on human capital and labour productivity. EPL may also be a way to internalise the social costs of dismissals by moving the social burden of re-allocating a worker to another job closer to the firm's profitability criteria (Lindbeck and Snower, 1988). However, if these regulations are very strict, as in many European countries, firms may become more cautious about adjusting their workforce with the ultimate effect of reducing labour turnover, e.g. movements from employment to unemployment and from unemployment back to employment (Bertola, 1992). In addition, if hiring and firing costs are not transferred into lower wages, total labour costs for the firms increase and this may lead to a lower level of employment, other things being equal.

Empirical evidence on the impact of employment protection legislation is mixed, not least because of the lack of suitable data on the enforcement and evolutions of regulations over time (Bertola et al., 1999). A clear distinction exists between the potential effects of EPL on employment turnover as distinguished from the equilibrium level of employment (unemployment) and its compositions (temporary/permanent; youths/prime-age workers etc.). There is consistent empirical evidence that strict employment protection legislation reduces *unemployment turnover*. Under strict EPL provisions, the unemployment pool is more stagnant, with fewer people being laid off, but also fewer unemployed people getting a new job. (Bentolila and Bertola, 1990; and Nickell and Layard, 1998). The effects on employment turnover are less clear cut: Bertola and Rogerson (1997) and Boeri (1999) found similar job creation and job destruction rates across countries with different EPL regimes but lower unemployment inflows in flexible labour markets). As stressed in Boeri (1999) and OECD (1999), a possible explanation is that strict EPL may foster job-to-job shifts rather than overall employment turnover because insofar employers and workers will seek direct shifts from one job to another without intervening unemployment spells, in order to avoid the associated dismissal and search costs. Empirical proxies of job-to-job shifts support this claim at annual, but not at higher frequencies (see for example Blanchard and Portugal, 1998).

²⁶ For the purposes of this section the industry aggregate includes manufacturing, electricity gas & water and construction; the service aggregate includes retail, wholesale & hotels, transport & communication, banking, insurance & business services and private personal services.

Some studies (e.g. Scarpetta, 1996) suggest a detrimental effect of strict EPL on the level of employment to working-age population ratios. Nickell and Layard (1998) indicate that this may be partially due to the low participation rates in Southern European countries, which also have strict EPL. However, participation rates may be low, especially amongst the youths, precisely because employment prospects are lower the stricter the EPL system. There is also no consensus as to the overall impact of EPL on unemployment. Part of the disagreement stems from the use of different models. However, disagreement persists even amongst papers using the same indicator (the OECD summary index, see OECD Jobs Study, 1994a, 1994b, OECD *Employment Outlook*, 1999). However, a recent study (Elmeskov, Martin and Scarpetta, 1998) suggests a somewhat more robust effect on unemployment if changes in EPL over the past two decades are taken into account. These studies are based on formal regulations on EPL but do not take into account the enforcement of these regulations. In this respect, Blanchard and Jimeno (1995) point to the very different degree of enforcement in Spain compared with Portugal despite similar summary indicators of the stringency of EPL. In this respect Di Tella and MacCulloch (1998) use data based on surveys of business people over the 1980s and suggests a significant effect of strict EPL regulations on both unemployment and long-term unemployment. Boeri (1999) also suggests that countries with stronger employment protection for regular contracts tend to display a bimodal tenure distribution with either very short or very long tenures. In countries where fixed-term contracts are liberalised, a large share of employees with fixed-term contracts tend to insulate permanent workers from adjustment (Bentolila and Dolado, 1994), thereby increasing their bargaining power and the corresponding wage pressures.

Regulation and employment

71. Figure 3.4 considers the employment rates (employment over the working age population) in the total economy as well as in the non-agricultural sector and in the non-agricultural business sector in 1995. These employment rates are plotted against the summary indicators of labour and product market regulations. The rationale for excluding the agricultural sector is manifold. First, our regulatory indicators do not include provisions (such as those contained in national and supra-national agricultural policies) that are most relevant for explaining employment in this sector. Second, the sensitivity of employment to economy-wide regulations is likely to have peculiar features in agriculture due to the predominant presence of self-employment. Finally, the exclusion of agriculture allows avoiding spurious relationships between employment and regulations insofar as, over the sample period, the largest declines in agricultural employment have been experienced by countries characterised by restrictive regulatory environments. We also focus on the business sector because this is where regulations are most likely to affect employment decisions.²⁷ In the econometric analysis thereafter we estimate a reduced-form

²⁷ Employment in the government and business sectors are not independent over the long-run to the extent to which increases in government employment may crowd-out employment in the business sector either directly or through the increase in taxation required to finance it. Even in the short-run employment in the two sectors may closely interact if government try to compensate for employment losses in the business sector by inflating public employment. Some cross-country evidence supporting this kind of short-run interaction between the two employment rates is provided by Saint-Paul, G. (1999).

employment equation in which we consider total employment but also control for the size of government sector employment.

Figure 3.4. Employment rates and regulation

72. The bivariate plots suggest that countries with restrictive EPL and product market regulation tend to have lower employment rate and the negative relationship is even stronger if non-agricultural business sector employment rates are considered. The inverse relationship between employment rates and labour an product market regulations is confirmed by the calculation of the simple correlation coefficients of the non-agricultural business sector employment rate (1995) and its growth rate against several indicators of product market regulations and EPL (Table 3.1). Interestingly, both the level and the rate of growth of the employment rate display a significantly negative correlation across countries with the summary indicators of product and labour market regulations. In particular, both EPL regulations for permanent and temporary workers are negatively correlated with the employment rates and those for permanent workers seem to affect negatively the changes in employment over the past decade. Inward-oriented product market regulations seem to have a particularly detrimental effect on both the level and the evolution of employment in the business sector. Most of state control regulations are negatively correlated with the level and evolution of employment. Not surprisingly, barriers to entrepreneurship have a particularly detrimental effect on the evolution of business sector employment, as well as those related to trade and foreign investments.

Table 3.1. Simple correlations between employment rates and regulatory indicators

73. The correlations shown in Table 3.1 are at best only suggestive of an underlying relationship, since employment rates and regulatory indicators may be all driven by other factors ignored in the bivariate analysis and which are either unrelated to public policies (such as institutional features of the labour market) or related to public policies not considered above (such as taxation and social policies). In order to account for some of these factors in exploring the possible linkages between regulation and the employment rate, the following reduced-form equation was specified:

$$er_{it} = \mu_0 + \mu_i + \alpha erg_{it} + \sum_k \beta_k x_{kit} + \gamma z_{it} + \phi g_{it} + v_{it} \quad [1]$$

where i indexes countries, t the years, er_{it} is the non-agricultural employment rate, erg_{it} is the share of public employees in the working-age population (the public employment rate), x_{it} is a $k \times 1$ vector of policy and institutional variables, z_{it} is the summary measure of EPL, g_{it} is the output gap included to account for changes in the business cycle²⁸, μ_i is a constant, μ_0 is the country-specific effect not accounted for by the available explanatory variables, and v_{it} is the usual error term. All explanatory variables are time-varying.

74. The equation can be interpreted as the reduced-form deriving from a labour market equilibrium condition in wages and, therefore, relates employment to labour market institutions, taxation and social policies and regulations deemed likely to affect labour market conditions. We include the public employment rate on the right-hand-side of the equation to test for the hypothesis that only business sector employment rate is affected by policy institutions and labour and product market regulations. In other words, a unitary coefficient on the public employment rate would fully justify the focus on the business sector employment rate for the study of the effects of institutions and regulations on employment. Institutional variables include a measure of union density as well as a summary measure of wage bargaining that brings together the different features of co-ordination and the levels of bargaining into a single indicator. For example, the summary measure allows us to consider cases where cross-industry co-ordination between employers and unions in an industry bargaining setting (e.g., Germany and Austria and, more recently, Ireland and the Netherlands with centralised incomes policy agreements) may be an alternative, or functionally equivalent, to centralised systems. Tax and social variables include a measure of the tax wedge and a synthetic indicator of the generosity of the unemployment benefit system; the regulation variable has been constructed combining the 1990 and 1998

²⁸ The gap variable is defined as the proportional difference between actual and trend output, where the latter is estimated by applying the Hodrick-Prescott filter to GDP. To minimise possible problems in estimating trend output at the two extremes of the series (1983 and 1995), we have used longer time-series from 1970 to 1998. Moreover, the assumption of an identical parameter for the GAP variable across all cross-sectional units does not affect significantly the estimated coefficients for the other explanatory variables. An alternative equation with country-specific coefficients for the GAP variable produced similar results.

summary indicators of EPL with information about the timing of EPL reforms (concerning both temporary and regular workers) in OECD countries²⁹.

75. Table 3.2 shows the estimates of equation (1) on a panel of 19 OECD countries over the 1982-1995 period.³⁰ The F-test at the bottom of the table suggests that the null hypothesis of a unitary coefficient for the public employment rate is only rejected at the 5 per cent level. In other words, over the short period of time considered in the analysis, there is only weak evidence of a crowding-out effect of public employment on private employment. This is obviously a partial analysis, and to the extent that public employment is financed by increased tax rates-- whose coefficient is negative and statistically significant -- public employment has a detrimental effect on business-sector employment. Moreover, the estimated coefficients for the measures of centralisation/co-ordination (decentralised countries are the reference group) give some support to the hump-shaped hypothesis (Calmfors and Driffill, 1988), whereby both highly centralised/co-ordinated systems and fully decentralised systems help to restrain the wage claims of insiders, and thereby lead to higher employment rates than in intermediate systems.³¹ The estimated coefficients of the other policy and institutional variables are generally significant and signed according to priors, with union density, unemployment benefits and tax wedges having a negative impact on the employment rate. More importantly, even controlling for these factors, the time-varying measure of EPL retains a negative and significant (at the 10 per cent level) impact on the employment rate, confirming the results of the bivariate analysis. Thus restrictive hiring and firing regulations appear to affect labour demand and supply in ways that reduce the equilibrium rate of employment.

²⁹ Details on the construction of the institutional and policy variables can be found in Scarpetta (1996). Time varying indicators of the degree of centralisation and co-ordination in wage bargaining are reported in Elmeskov, Martin and Scarpetta (1998). The methodology used to construct the time-varying EPL indicator is described in Nicoletti and Scarpetta (forthcoming).

³⁰ A diagnostic analysis based on the studentised residuals and the leverage values suggest that several observations significantly increase the standard error of the regression or affect the estimated coefficients. These observations have been removed from the sample: 1995 for Finland and Japan; 1994 for Ireland; 1987 and 1994 for Norway; 1987 for New Zealand; 1991 for Portugal; 1985 for Spain; and 1984 for the United States. See Scarpetta (1996) for details on the tests used to identify outliers in the data set.

³¹ In the tables the reference group includes countries with a low index of centralisation/co-ordination. Therefore, the estimated coefficients on the other two groups refer to the performance of these systems relative to decentralised/unco-ordinated bargaining systems. A positive coefficient implies, other things being equal, a positive effect on the employment rate of the bargaining system with respect to the decentralised system, and vice versa.

Table 3.2. Reduced-form employment rate equation

76. The influence of cross-country differences in product market regulations on the comparative levels of the non-employment rates were investigated by relating the estimated country-specific effects to the regulatory indicators. As expected, the significant correlations found in the previous bivariate analysis are weakened once controlling for several factors affecting cross-country differences in employment. However, correlations generally remain correctly signed and a few of them retain significance, especially when outliers are eliminated (Table 3.3). As mentioned above, due to lags in the effects of structural policies on market outcomes, in countries (such as Ireland) where radical product market reforms have been implemented towards the end of the sample period, the end-of-period measure of regulation necessarily bears little relationship with the average employment rate even if a strong causal link between regulations and employment were to exist. Therefore, bivariate correlations have been computed both with and without this country.

Table 3.3. The employment rate: country-specific effects and regulation

77. While the summary indicator of product market regulation has a low level of significance, several of its components are significant at the 10 per cent level (or less). The most important negative product market influences on the employment rate are the presence of a high degree of state control in business sector activities, especially through regulations interfering in the activity of private (or privatised) business enterprises and administrative burdens on business startups. Hence, entry restrictions due to costly and opaque administrative practices and the distortion of market mechanisms associated with the excessive presence of the state in the business sector would appear to explain the pattern of employment rates across OECD countries over and above the policy, regulatory and institutional factors specific to the labour market. In any event, these results should be seen in the light of the strong positive correlation between the summary measures of EPL and product market regulation, which makes it difficult to identify their separate contribution to the explanation of cross-country differences in employment rates.

Regulation and wages

78. Several empirical studies have found that wages differ systematically across sectors, even after controlling for observable worker characteristics³². Evidence from micro studies suggests that industry-specific wage premia is a significant component of total compensation, particularly in Canada and the United States, while it is of lesser importance in many EU countries. However, even in the European countries the industry-specific component in wages is estimated to be 10 per cent or higher of total compensation of employees. Most studies also suggest that wage premia are persistent over time. Empirical studies devoted to wage premia often have a fine sectoral breakdown, focusing on the manufacturing sector in a given country. There are, however, significant differences across countries and sectors in real wages, even after controlling for labour productivity and differences in purchasing power (i.e. using comparative measures of unit labour costs).

79. Our principal aim here is to shed some light on the potential role played by EPL and product market regulations in explaining cross-country differences in industry-specific unit labour costs. To this end, we estimate wage premia across 2-digit manufacturing sectors and across countries. The dependent variable is the log-wage (in US \$) and the explanatory variables are the log-productivity (in sectoral PPPs), the expenditure for R&D, the share of self-employed in the industry, the degree of import penetration and an aggregate demand variable (the output gap). These estimates are certainly crude approximations of wage premia and are likely to offer only broad-brush indications, at least as compared with those obtained in other studies using microdata and much more detailed information on the human capital and demographic features of workers³³ as well as work place characteristics³⁴. However, the present analysis makes it possible to relate the estimated wage premia to the available cross-country indicators of labour and product market regulations. We adopt a two-stage approach in which industry-specific variables are used to estimate wage premia and the latter are correlated to the economy-wide indicators of EPL and product market regulation.

³² Among others see: for the United States, Krueger and Summers (1988); Katz and Summers (1989); for Japan, Tachibanachi and Ohta (1992); for Germany, Wagner (1991), and Bellman and Möller (1993); for Canada, Gera and Grenier (1994); for Sweden, and a comparison with the United States, Edin and Zetterberg (1989); for Austria, Hofer (1992), and Barth and Zweimüller (1992); for Switzerland, Ferro-Luzzi (1994); for Norway, Barth and Zweimüller (1992); for Denmark, Dansk Økonomi (1995). Katz and Summers also estimate rents going to capital owners in the United States, and find that they are very small.

³³ Microstudies often employ detailed data on job tenure, fine occupational and education breakdown, data on geographical location, etc.

80. The following equation was estimated for manufacturing industries:

$$rw_{ist} = a + b_1 lp_{ist} + b_2 RD_{ist} + b_3 se_{ist} + b_4 impen_{ist} + b_4 gap_{ist} + e_{ist} \quad [3]$$

where: i indexes countries (15); s indexes the manufacturing industries (9); t indexes the year (1982 to 1995); rw_{ist} = industry real wage (in PPP US \$); lp_{ist} = industry real value-added per worker (in sectoral PPPs); RD_{ist} = share of R&D expenditure in value added; se_{ist} = share of self-employed in total employment; $impen_{ist}$ = indicator of import penetration, i.e. the ratio of import to absorption (adjusted by country size by regressing the indicator over the absolute level of GDP and a constant); gap_{it} = output gap. Two specifications are presented in the table: one using logarithms of both real wages and real productivity, and one using real wages and productivity relative to the average US manufacturing.

81. The equation was estimated by panel data techniques and includes fixed effects (country-industry) to control for omitted specific effects. In a second stage, the industry-specific fixed effects are correlated sector by sector across countries with indicators of labour and product market regulations. Estimates of the relative wage specification are somewhat different but do not change the basic conclusions of this exercise. Apart from the output gap, the equations include only explanatory variables that have a sectoral dimension, since the principal aim of these first-stage estimations is to account for as much sectoral variation as possible. The regression results for the two specifications are shown in Table 3.4. The F-tests reported at the bottom of the table always reject the null hypothesis that the effect of country/industry dummies is jointly zero, suggesting that the country/industry affiliation has a large impact on real wages, even after controlling for labour productivity and other structural factors.

Table 3.4. Reduced-form wage equations

82. As expected, differences in labour productivity explain a great deal of the variations in real wages across industries and countries. Yet, the other structural factors also play an important role. The results provide some empirical support for the hypothesis that the introduction of new products or processes -- proxied by the R&D intensity -- gives rise to temporary market power,

³⁴ Such data include working hour schedules and data on other working conditions

and that the quasi-rents can show up in wages³⁵. Somewhat surprisingly, the results also indicate a positive (although not significant) association between the real wages and import penetration. Given the high level of intra-industry trade within the countries included in the sample, this could be explained by the fact that high import sectors are often those with the widest product differentiation, which may give rise to temporary market power much in the same way as in R & D intensive industries.

83. Table 3.5 presents the simple correlations between the estimated country/sector specific effects and indicators of product and labour market regulations for the nine 2-digit manufacturing industries. The top panel include correlations for all countries in the sample, while the bottom panel reports the same correlations excluding the countries which appeared to be outliers in the sample (Portugal in food and textile and Austria in basic metal industries).

Table 3.5. Wage premia and regulation

84. Overall, excess wages are positively correlated with both labour and product market regulations. However, many of the correlations have relatively low levels of statistical significance. Using the whole sample of countries, correlations with product market regulations are significant (at 10 per cent levels) in the food industry, the paper and printing industry, the non-metallic mineral industry, the fabricated metal products industry and the other manufacturing industry, while significant correlations with EPL indicators can be detected in the food industry (after excluding the outlier country), the fabricated metal products industry and the other manufacturing industry. Amongst product market regulations, legal barriers to entry exert a strong effect on wage premia in both fragmented industries, such as food and non-metallic mineral, and segmented industries, such as paper and printing. Regulatory and tariff barriers to trade are positively associated with wage premia in high import/high product differentiation industries, such as food and other manufacturing. And state control affects wage premia in the paper and printing and fabricated metal products industries. Surprisingly, some regulatory provisions display a significantly negative correlation with the estimated wage premia: non-tariff barriers seem to be associated with lower wage premia in almost all sectors, while administrative burdens are

³⁵ This result is confirmed by Katz and Summers (1989) for the US and Tachibanaki and Ohta (1992) for Japan, while the link between innovations and wages is confirmed at the firm level in the United Kingdom (Van Reenen, 1993).

associated with lower wage premia in the wood and non-metallic mineral industries. Administrative burdens and opacities in fragmented industries may favor the development of individual enterprises for which costs and procedures are often lower (see below for more evidence on this), thereby lowering industry wages. On the other hand, the result concerning non-tariff barriers seems harder to explain.

The impact of regulation on employment composition

85. Differences in the regulatory environments faced by workers and firms may also affect the composition of employment (Box 2). Here we focus on the effect of EPL and certain kinds of product market regulations on the share of self-employed in non-agricultural business employment (henceforth the self-employment rate). Specifically, we consider the effects of administrative burdens affecting the start-up of corporations and sole proprietor enterprises in an asymmetric way, thereby favouring the development of one or the other form of company structure. To the extent that excess burdens fall on corporations, the creation of individual enterprises will be encouraged, thereby increasing the self-employment rate.

86. Figure 3.5 shows the cross-country bivariate plot of the self-employment rate against an indicator of excess burdens on corporations³⁶. The self-employment rate appears to be positively related to excess burdens, save for Belgium where self-employment is boosted by fiscal distortions despite the relatively high administrative burdens falling on startups of sole proprietor firms. Table 3.6 shows that the correlation between excess burdens and the self-employment rate is significant at the 10 per cent level. The table points out that self-employment rates are also significantly correlated with the summary indicator of product market regulation, an indicator of the scope of the public enterprise sector and, most importantly, EPL. Interestingly, correlations are particularly strong with EPL for temporary workers, suggesting that rigidities affecting this kind of work may result, especially in service sectors, in the choice of organisational structures based on the use of consultants and/or franchising. However, these correlations may not be robust when account is taken of other factors determining cross-country differences in self-employment rates.

Figure 3.5. The self-employment rate and regulation

Table 3.6. Simple correlations between self-employment rates and regulatory indicators

87. The determinants of self-employment are more difficult to pin down than those of dependent employment, partly due to the lack of comparative data. The ratio of self-employment to total employment can be affected by the stage of development and the structure of the economy as well as by policy and institutional variables that make self-employment more advantageous relative to dependent employment. Unfortunately, little cross-country information is available on the role played by such variables as tax and benefit policies in the decision to be self-employed and, therefore, we focus solely on the effects of excess burdens and EPL. These factors capture the distortions in incentives caused by (a) differences in the administrative treatment of the start-up of corporate firms versus sole proprietor firms; and (b) differences in the legal treatment of dependent vs independent labour. Ceteris paribus, restrictive EPL and excess burdens on corporations should lead to a higher incidence of self employment. In any event, we expect that (a) the effects of regulations on the employment mix differ in different sectors; and (b) compositional effects unfold slowly over time, with most of the information lying in the cross-country dimension of the data. Thus, we estimate equations for the overall business sector, manufacturing and services and adopt a single-stage estimation approach, in which regulatory indicators are introduced as fixed country-specific effects using the average values of EPL regulations over the two periods (1990 and 1998).

88. The reduced-form equation for the self-employment rate was specified as follows:

$$ser_{it} = m_0 + m_1 + \sum_k b_k w_{kit} + dz_i + g_i + j g_{it} + n_{it} \quad [2]$$

where ser_{it} is the self-employment rate, w_{ki} is a $k \times 1$ vector of variables on economic structure, z_i is the summary indicator of EPL and r_i is the indicator of excess burdens for startups of corporate firms over sole proprietor firms. The other variables are defined as in equation [1]. Structural

³⁶ "Excess burdens" are defined as the difference between the indicators of administrative burdens on the creation of corporations and sole-proprietor firms.

variables include the share of agriculture in total GDP, the level of GDP per capita (in PPPs)³⁷ and an indicator of the sectoral composition of non-agricultural GDP (value added mix), defined as an index (relative to the OECD average) of the extent to which the composition of GDP is twisted towards high productivity sectors³⁸.

89. The regression results are shown in Table 3.7. Since regulatory variables lack the time dimension, a random effects specification was retained. (the null hypothesis of lack of correlation between the specific effects and the explanatory variables could not be rejected at the 10 per cent level). As expected, the regression results show that the overall self-employment rate increases with the share of agricultural GDP, while the sectoral rates decrease with GDP per capita. There is also some evidence that producing in high productivity service sectors increases the self-employment rate in both manufacturing and services.

Table 3.7. Reduced-form self-employment rate equation

90. The business sector self-employment rate appears to be positively affected by both EPL and excess burdens, although the level of significance of these two variables is low. Restrictive hiring and firing procedures may favour the self-employment rate in two ways. First the creation of small individual enterprises may be encouraged, especially when there are low workforce thresholds above which EPL applies. Second, as suggested above, the equilibrium level of dependent employment may be reduced relative to self-employment. In contrast, in manufacturing the presence of high administrative barriers relative to those faced for the creation of sole proprietor enterprises raises the self-employment rate by favouring this kind of organisational structure. These effects are better identified at the sectoral level. As expected, the effect of regulations is different in manufacturing and services. In manufacturing, the effect of excess burdens dominates encouraging the fragmentation of the production structure in micro units. In services, the effect of EPL is stronger, encouraging an organisation of work based on the use of consultants and on franchising. This confirms previous findings based on more anecdotal

³⁷ We used the 1993 data on purchasing power parity (PPP) compiled jointly by the OECD and Eurostat to approximate product prices for manufacturing and services industries. To this end, a mapping was established from 202 basic expenditure headings (in which the collection of 2000 expenditure prices of individual goods is aggregated) to the classification of industries of the International Sectoral Database (ISDB).

³⁸ Indices that are specific to each of the three sectoral aggregates were constructed. Relative sectoral productivities were assumed to be those of the OECD average.

evidence³⁹. The combination of restrictive EPL and heavy administrative burdens may therefore contribute to explain the relatively high self-employment rates in some OECD countries.

³⁹ See Grubb and Wells (1993); OECD Jobs Study (1994).

**Table 3.1 Simple correlations between employment rates and regulatory indicators
(non-agricultural business sector, 1982-1995)**

Regulatory indicators	Employment rate 1995	Growth in employment rate 1982-1995
EPL	-0.61*	-0.45*
<i>EPL for reg. workers</i>	-0.44*	-0.46*
<i>EPL for temp. workers</i>	-0.64*	-0.37
Product market regulation	-0.71*	-0.43*
<i>Inward-oriented policies</i>	-0.72*	-0.42*
<i>Outward-oriented policies</i>	-0.08	-0.10
State control	-0.73*	-0.39*
<i>Public ownership</i>	-0.71*	-0.44*
<i>Interference in private firms</i>	-0.55*	-0.23
<i>Size of public enterprise sector</i>	-0.62*	-0.69*
<i>Scope of public enterprise sector</i>	-0.61*	-0.40*
<i>Special voting rights</i>	-0.43*	-0.04
<i>Use of command and control regulation</i>	-0.48*	-0.23
Barriers to entrepreneurship	-0.17	-0.44*
<i>Administrative transparency</i>	-0.04	-0.55*
<i>Adm. burdens on business startups</i>	-0.25	-0.26
<i>Legal barriers to entry</i>	0.05	0.12
<i>Adm. burdens for corporations</i>	-0.37	-0.15
<i>Adm. Burdens for sole proprietor firms</i>	0.06	-0.29
Barriers to trade and investment	-0.20	-0.12
<i>Regulatory and tariff barriers</i>	-0.14	0.07
<i>Other trade barriers</i>	-0.18	-0.49*

Notes: * indicates significance at the 10 per cent levels. Observations range from 19 to 22 depending on the indicator

Table 3.2 Reduced-form employment rate equation, 1982-1995
(non-agric. employment/working age population, fixed effects)

Independent variables	coeff.	st- err.	T-stat.
Gov. sector employment	0.71	0.12	6.03 ***
Unemployment benefits: repl. rate	-11.22	2.66	-4.22 ***
Union density	-0.07	0.03	-2.67 ***
Corporatism (intermediate)	-1.77	0.44	-4.05 ***
Corporatism (high)	0.74	0.41	1.81 *
Employment protection legislation	-1.35	0.71	-1.91 *
Tax wedge	-0.09	0.05	-1.73 *
Output gap	0.61	0.04	17.1 ***
No. of observations	223		
No. of countries	19		
F-test (fixed effects)	129.1 ***		
F-test (gov. sect. empl. = 1) ¹	6.1 **		

Each coefficient represents the expected change in the employment rate by an unitary change in the independent variable.

***: statistically significant at the 1% level; **: at the 5% level; *: at the 10% level.

1. The null hypothesis is that the coefficient of the gov. sect. employment rate is equal to 1. The test does not reject the null hypothesis at the 1 per cent level.

**Table 3.3 The employment rate: country-specific effects and regulation
(non-agricultural, 1982-1995)**

Regulatory indicators	Including outliers	Excluding outliers
Product market regulation	-0.16	-0.30
<i>Inward-oriented policies</i>	-0.30	-0.40
<i>Outward-oriented policies</i>	0.38	0.31
State control	-0.32	-0.42*
<i>Public ownership</i>	-0.21	-0.24
<i>Interference in private firms</i>	-0.34	-0.49*
<i>Size of public enterprise sector</i>	0.05	0.01
<i>Scope of public enterprise sector</i>	-0.33	-0.39
<i>Special voting rights</i>	-0.60*	-0.67*
<i>Use of command and control regulation</i>	-0.17	-0.33
Barriers to entrepreneurship	-0.02	-0.08
<i>Administrative transparency</i>	0.24	0.28
<i>Adm. burdens on business startups</i>	-0.36	-0.53*
<i>Legal barriers to entry</i>	0.26	0.35
<i>Adm. burdens for corporations</i>	-0.54*	-0.72*
<i>Adm. burdens for sole proprietor firms</i>	-0.17	-0.42
Barriers to trade and investment	0.38	0.31
<i>Regulatory and tariff barriers</i>	0.31	0.28
<i>Other trade barriers</i>	0.22	0.14
<i>Regulatory barriers</i>	0.10	0.04
<i>Non-tariff barriers</i>	-0.12	-0.08

Notes: * indicates significance at 10 per cent levels. Outlier country is Ireland

Table 3.4 Wage equations, 1982-1995a
(2-digits manufacturing industries, fixed effects)

Independent variables	log equation ¹			relative wage ²		
	coeff.	st- err.	T-stat.	coeff.	st- err.	T-stat.
labour productivity	0.97	0.04	22.07	0.33	0.07	5.05
Research & Development	2.84	0.50	5.62	0.27	0.03	9.66
Share of self-employed	-0.63	0.43	-1.47	0.15	0.30	0.49
Import penetration	0.03	0.03	1.24	0.03	0.02	1.41
Output gap	1.10	0.17	6.32	1.07	0.12	8.98
No. of observations	1440			1440		
No. of sectors	9			9		
No. of countries	15			15		
F-test (fixed effects)	12.6 ***			17.9 ***		

***: statistically significant at the 1% level; ** at the 5% level; at the 10% level.

1. Real wages and labour productivity are in logarithm form.

2. Real wages and labour productivity are relative to the (PPP) US manufacturing averages.

Table 3.5 Wage premia and regulation ¹
(Manufacturing industries, two digits)

	3100	3200	3300	3400	3500	3600	3700	3800	3900
	Food, beverage and tobacco	Textile, wearing, apparel and leather	Wood furniture	Paper and printing	Chemical, petroleum, rubber and plastic	Non- metallic mineral	Basic metal industries	Fabricated metal products	Other manufacturi ng
ict market regulation	-0.11	0.01	0.36	0.58*	0.43	0.45*	0.32	0.56*	0.34
ontrol	-0.08	-0.05	0.32	0.55*	0.33	-0.63*	0.29	0.48*	0.17
iers to entrepreneurship	0.27	0.29	-0.16	0.05	-0.05	0.07	-0.02	-0.02	0.24
l barriers to entry	0.43*	0.40	-0.03	0.47*	0.22	0.44*	0.15	0.48*	-0.08
<i>i. burdens for corporations</i>	-0.16	0.17	0.37	-0.04	0.05	-0.50*	-0.15	0.13	0.23
<i>nces and permits system</i>	0.05	-0.08	-0.54*	-0.10	-0.38	0.08	0.28	-0.17	-0.06
<i>munication and enforcement of adm. proc.</i>	0.25	0.41	0.18	0.00	-0.26	0.25	-0.26	-0.09	0.61*
iers to trade and investment	-0.11	-0.05	0.13	-0.02	0.24	0.34	0.06	0.13	0.26
latory and tariff barriers	0.46*	0.41	0.13	0.25	0.08	0.31	0.04	0.33	0.60*
<i>i-tariff barriers</i>	-0.49*	-0.45	0.04	-0.25	0.01	-0.66*	0.10	-0.54*	-0.42
<i>L, permanent workers</i>	0.04	0.33	0.36	0.37	0.13	-0.37	0.24	0.66*	0.67*
<i>L, temporary workers</i>	0.03	0.29	0.30	0.28	0.16	-0.26	0.27	0.59*	0.70*
	0.04	0.32	0.36	0.39	0.09	-0.42	0.16	0.61*	0.55*

excluding outliers ²

ict market regulation	0.12	0.01					0.49		
ontrol	0.04	-0.05					0.46		
iers to entrepreneurship	0.17	0.29					-0.16		
l barriers to entry	0.49*	0.40					0.22		
<i>i. burdens for corporations</i>	-0.17	0.17					-0.11		
<i>nces and permits system</i>	0.11	-0.08					-0.05		
<i>munication and enforcement of adm. proc.</i>	0.21	0.41					-0.38		
iers to trade and investment	0.16	-0.05					0.14		
latory and tariff barriers	0.46*	0.41					-0.08		
<i>i-tariff barriers</i>	-0.59*	-0.45*					0.23		
ir market regulation	0.44*	0.33					0.39		
<i>our market reg., permanent</i>	0.52*	0.29					0.48		
<i>our market reg., temporary</i>	0.29	0.32					0.24		

* indicates significance at the 10 per cent levels. Observations range from 19 to 22 depending on the industry and the statistical significance if affected by sample size.

¹ wage premia is the country/sector residual identified by the wage equation in Table 7.

² outliers are: Portugal in sectors 3100 and 3200; Austria in sector 3700.

**Table 3.6 Simple correlations between self-employment rates and regulatory indicators
(non-agricultural business sector, 1982-1995)**

Regulatory indicators	Self-employment rate
Product market regulation	0.39*
<i>Excess burdens on corporations</i>	0.47*
<i>Scope of public enterprise sector</i>	0.37*
EPL (1998)	0.42*
<i>EPL for permanent workers(1998)</i>	0.13
<i>EPL for temporary workers (1998)</i>	0.58*

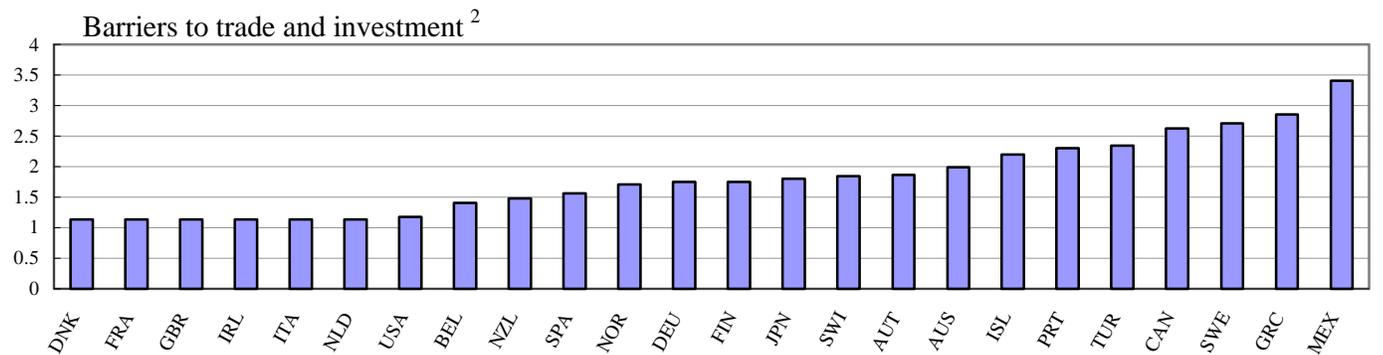
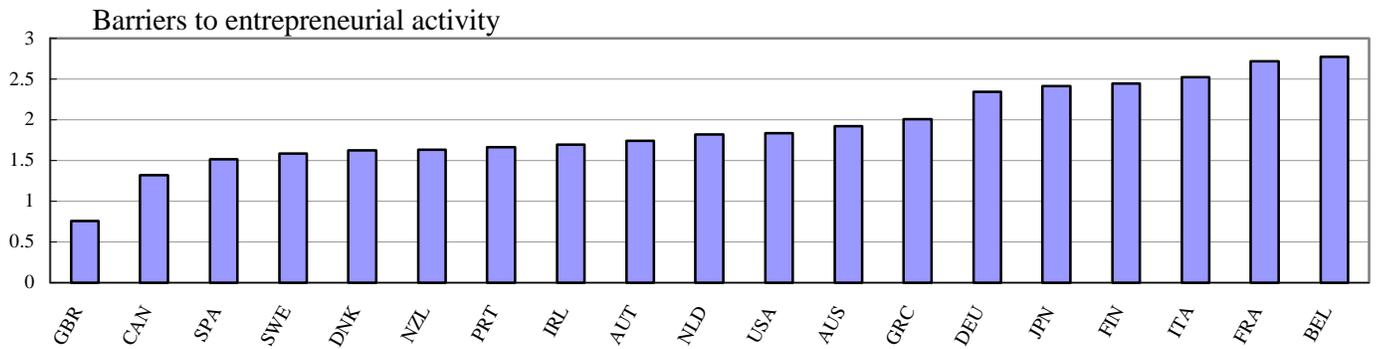
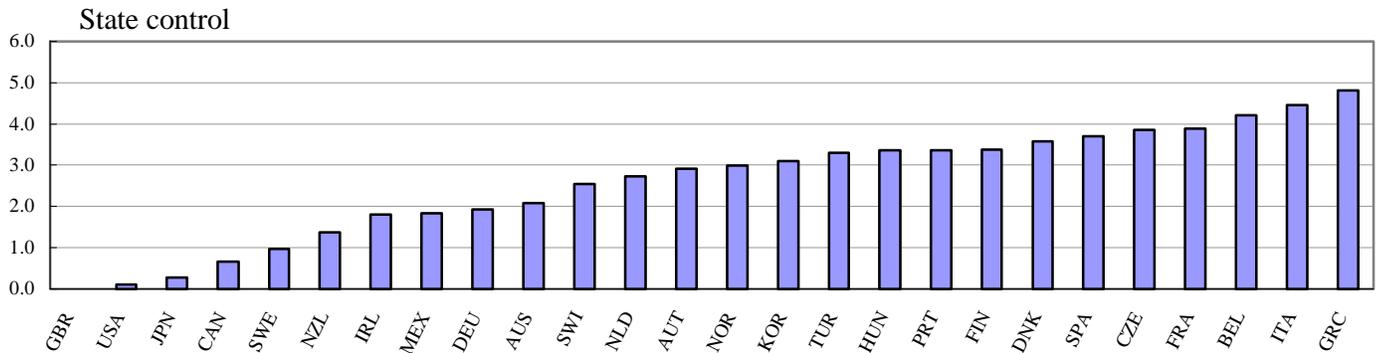
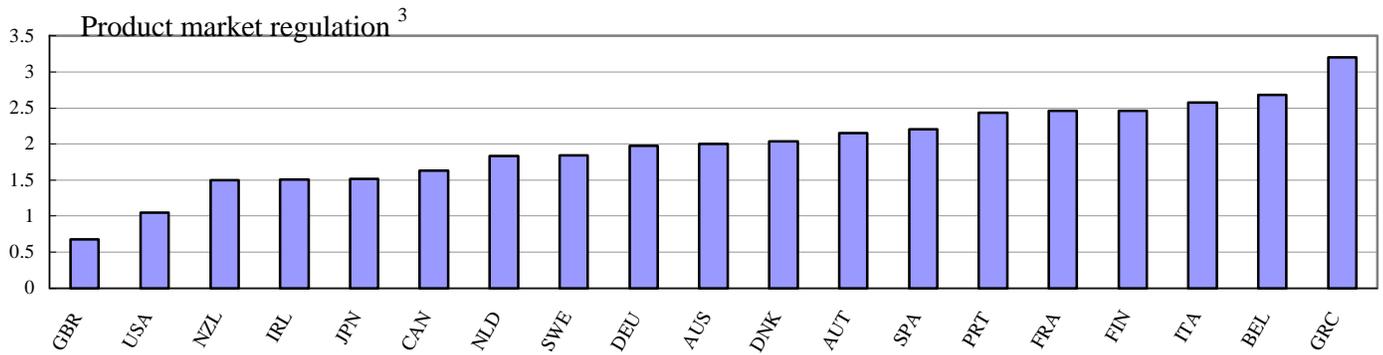
Notes: * indicates significance at 10 per cent level. Observations range from 19 to 22 depending on the indicator, affecting the significance threshold

Table 3.7 Reduced-form self-employment equations, 1982-1995
(Random effects, FGLS)

Independent variables	Total economy			Manufacturing			Services		
	coeff.	st- err.	T-stat.	coeff.	st- err.	T-stat.	coeff.	st- err.	T-stat.
Per-capita GDP				-0.01	0.01	-0.97	-0.05	0.01	-5.00
Composition of value added				0.04	0.02	1.53	0.03	0.02	1.47
Share of agriculture	0.66	0.05	14.42						
Employment protection legislation	0.02	0.01	1.63	0.00	0.01	0.37	0.04	0.02	2.65
Excess regulation (corporate-sole proprietor)	0.03	0.02	1.66	0.03	0.01	2.40	0.02	0.02	1.00
Output gap	-0.01	0.03	-0.30	0.04	0.05	0.85	0.04	0.04	1.24
No. of observations	235			210			217		
No. of countries	18			17			18		
F-test (fixed effects)	12.6 ***			14.1 ***			14.1 ***		
B-P test	1365.7 ***			949.9 ***			1287.7 ***		
Hausman test	1.4			10.7 **			9.3 **		

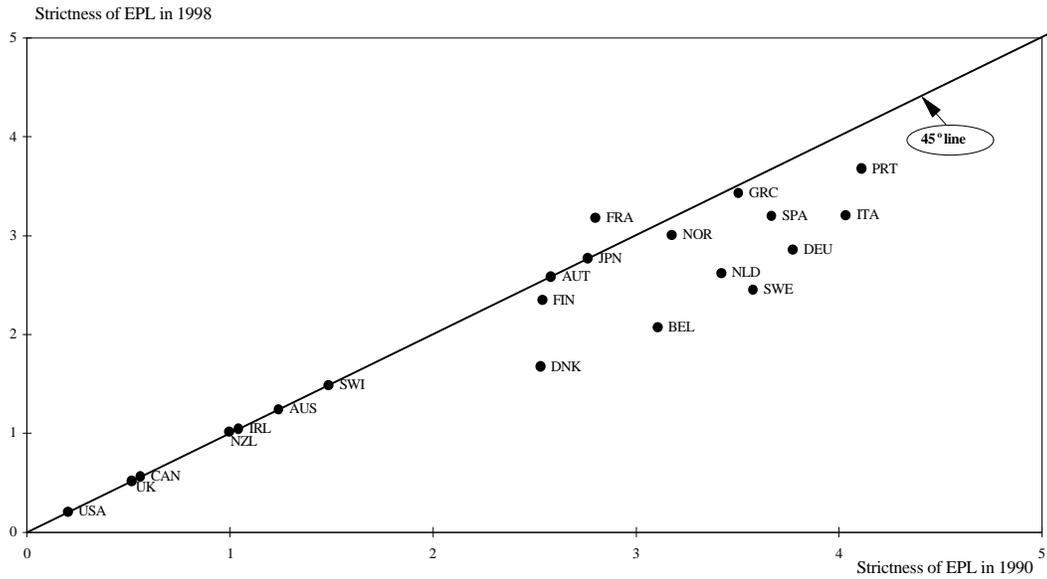
***: statistically significant at the 1% level; ** at the 5% level; at 10% level.

Figure 1. Differences in product market regulation^{1,2}

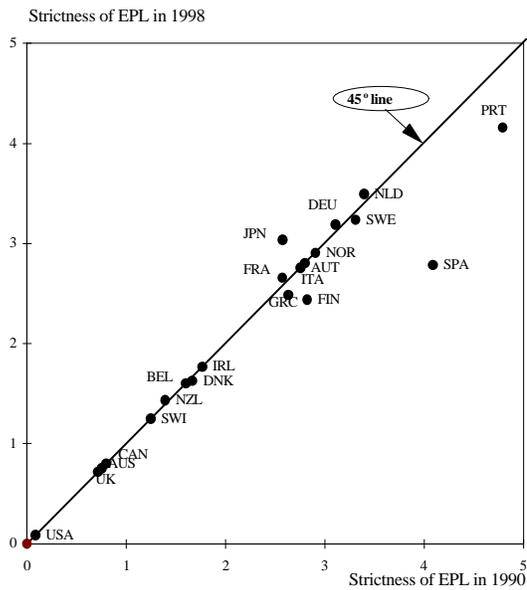


1. Country scores reflect the results of factor analysis. Summary indicators are obtained weighting factors by their relative contributions in explaining the total variance of the factors. All variables were cast in 0-6 scale from least to most regulated.
2. Factor analysis applied to lower-level indicators.
3. Factor analysis applied to summary indicators of state control, barriers to entrepreneurial activity and barriers to trade and investment.

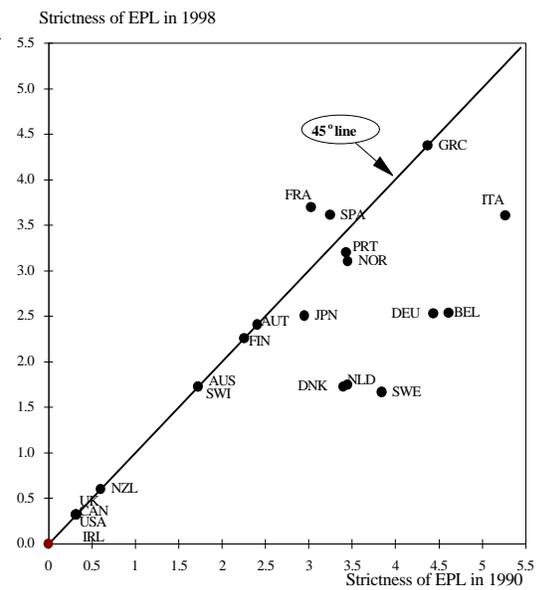
Panel A. Regular and temporary contracts



Panel B. Regular contracts



Panel C. Temporary contracts

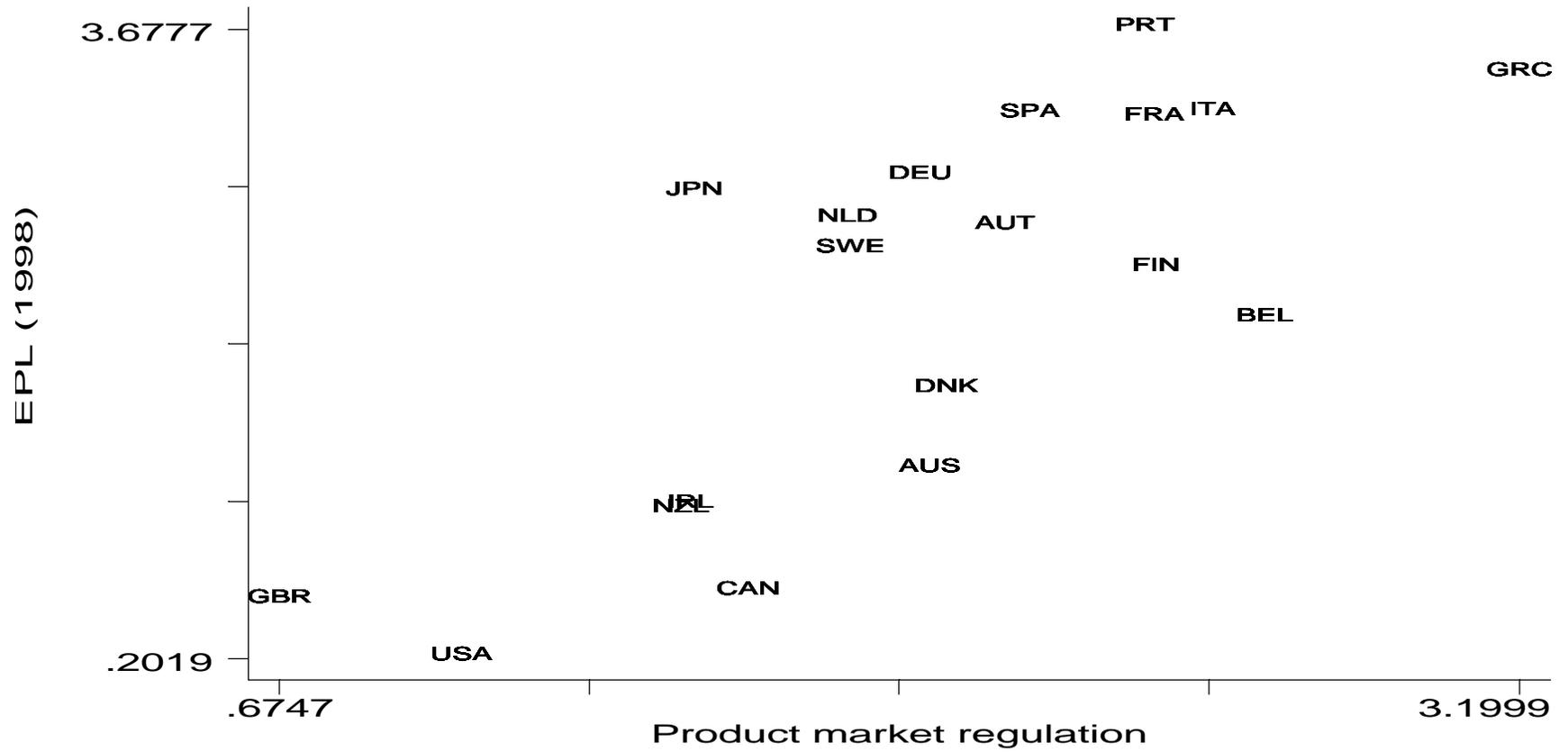


Note:

1. The indicator is the weighted sum of indicators referring to several aspects of employment protection regulations for regular contracts as well as for fixed-term and TWA contracts. The original indicators range from 0 (least restrictive) to 6 (most restrictive). The weights are extracted from a factor analysis of original indicators.

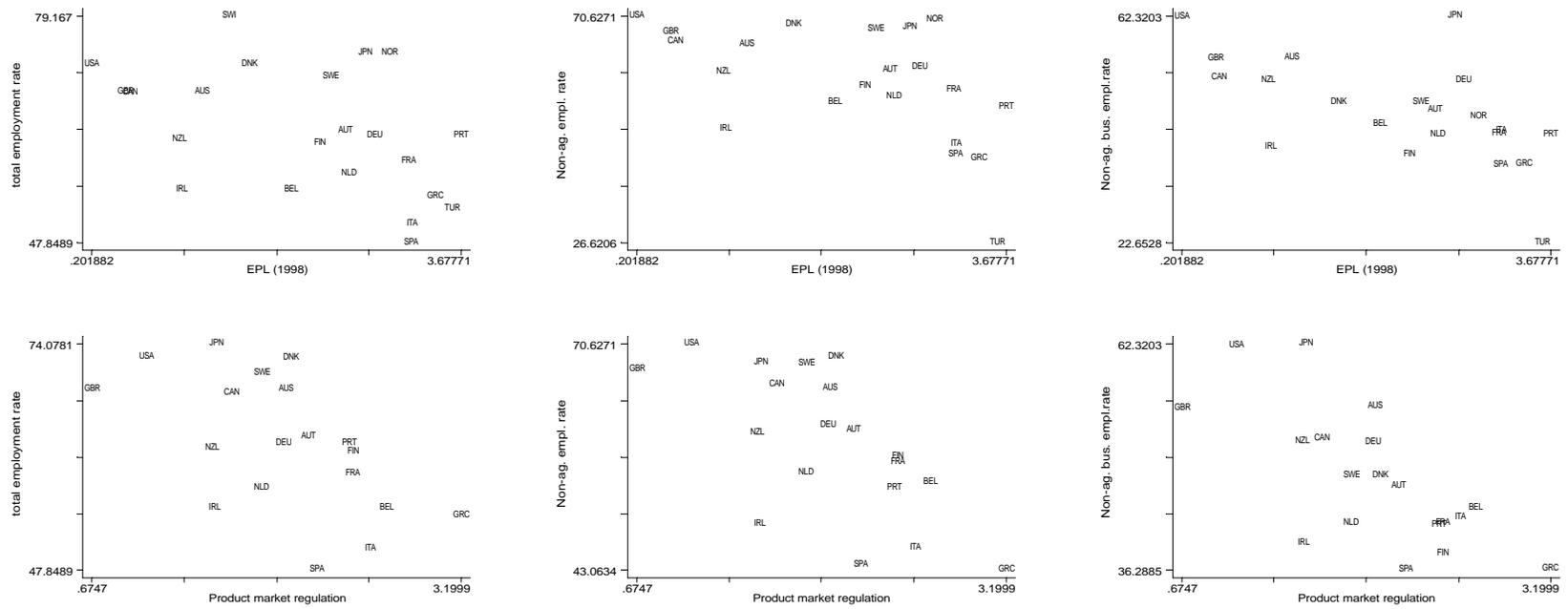
Source: Secretariat estimates.

Figure 3.3 Product and labour market regulations



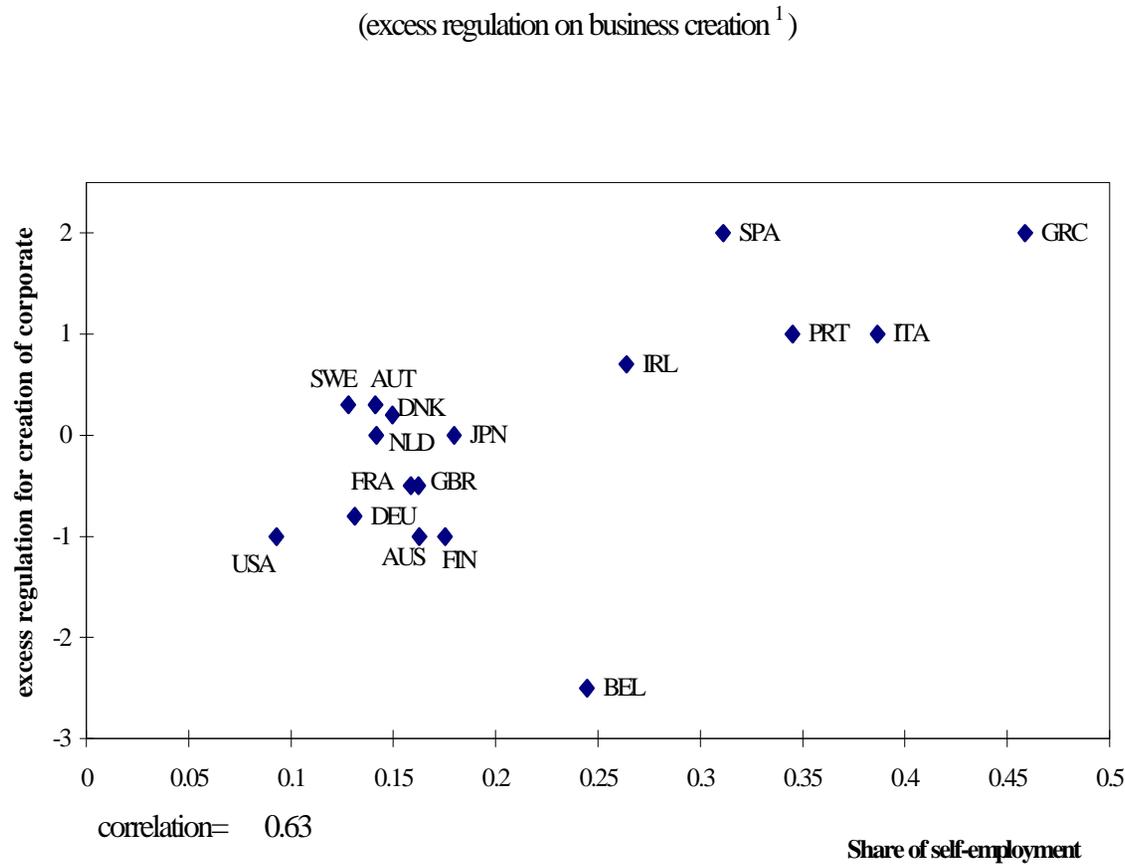
Correlation = 0.75
t- statistic = 4.75

Figure 3.4 Employment rate and regulations¹



1. The employment rates refer to 1995.

Figure 3.5 The self-employment rate and regulation



1. The difference between the index of tightness of regulations for the creation of a corporate firm and the index of tightness of regulation on the creation of a sole proprietor enterprise.

SECTION 4

THE IMPLICATIONS OF EMU FOR EUROPEAN LABOUR MARKETS

91. It is important to ask whether the creation of the European Monetary Union will provide additional incentives to agents and governments to adjust behaviors and policies in a direction which favors a more competitive environment in the labour and product markets, with possible beneficial effects on employment. While both increased competition and monetary integration are likely to have direct and distinct effects on the functioning of labour markets, they are also related in so far as monetary integration is likely to affect the level of competition, e.g. by facilitating price comparisons across countries. The objective of this section is to discuss some of the likely structural changes which may be brought about by the EMU. We discuss first the possible direct effects of monetary integration on the degree of price competition and, second, the consequences of the single currency for the flexibility of product and labour markets.

92. Empirically, these issues can be addressed by looking at the past experience of subsets of EU countries that participated in exchange rate stability zones, considering the latter as proxies for monetary unions. At the risk of over-simplifying complicated historical developments, in the following we distinguish between (i) the “D-Mark area”, i.e. Germany and countries that succeeded in pegging their exchange rate to the D-Mark over the past two decades (Austria, Belgium, the Netherlands and Luxemburg); (ii) the “Core-EMS area”, (D-Mark area plus France); and (iii) the “Other EU area”, i.e. countries that entered EMS in 1979 but underwent frequent and significant adjustments of their parities within the ERM (eventually leading to their temporary or permanent exit from the system), countries that entered EMS at a late stage and countries that

never participated into the exchange rate agreement. In particular, we would like to detect if exchange rate stability and the corresponding loss of monetary autonomy has brought about (a) a higher degree of price convergence than in other EU countries; (b) changes in behaviour conducive to increased (nominal) wage and price flexibility; and (c) changes in institutions and structural policies which led to a reduction of real rigidities potentially affecting equilibrium unemployment. The presence of such changes could be interpreted as evidence that monetary integration encourages fundamental reforms in the labour and product markets, making the abandonment of independent monetary policy beneficial also on this ground.

Price convergence

93. The transition to a single currency should increase the transparency of prices for similar goods across countries participating in the currency union. In principle, increased transparency raises opportunities for arbitrage by consumers and competitive pressures for producers. As a result, the convergence of prices across countries should be accelerated, even though differences will remain due to factors related to location, tastes, etc. Therefore, by looking at price convergence we can infer whether monetary integration has had any direct effect on product market competition.

94. Looking back at the experience of EU countries, we wish to check to what extent developments in price disparities have reflected differences in exchange rate regimes. Specifically, it is useful to see whether those EU-countries where exchange rates have been relatively stable witnessed a stronger tendency for prices to converge (e.g. due to greater transparency of prices quoted in national currencies) than countries which have had relatively wide fluctuation bands or frequently adjusted central rates. Changes in exchange rates were particularly important at the beginning of the 1980s, with especially Portugal and Greece experiencing major depreciations of their currencies against the ECU. However, exchange rate fluctuations have remained important also in subsequent years in the majority of EU-countries, culminating in the EMS currency crisis of the early 1990s. Countries which witnessed relatively high stability in their bilateral exchange rates are Germany, the Netherlands, Belgium, Luxembourg and Austria as the latter countries had essentially pegged their currencies to the Deutsche Mark for more than a decade.

95. As argued in Section 1, an overall price convergence process took place in the EU over the 1985-1993 period. As a starting point, it is important to establish whether this overall process could have resulted merely from changes in exchange rates. While the countries in the D-mark area saw their currencies appreciate relative to the ECU since the mid-1980s, Greece, Portugal, Spain and Italy experienced major depreciations against the ECU. According to the theory of (relative) purchasing power parities, changes in the exchange rate between two currencies should equal the difference in the percentage changes of the national price levels. Given that the countries with relatively low prices were typically the countries which experienced exchange rate depreciations, in the vast majority of cases changes in exchange rates have favoured an increased divergence in prices. For example, in 1980, the lowest price countries were Portugal, Spain, Greece and Italy, whereas the highest price countries were Denmark, France and Germany. In 1993, the low price countries were Portugal, Greece and the UK, while the high price countries were still Denmark, France and Germany. Therefore, the observed convergence in prices between the low-price and high-price countries cannot be attributed to exchange rate variations (CEC, 1997a).

96. Is it possible to identify groupings of EU countries where price structures have become more similar over the period 1985-1996? Following up on our analysis in Section 1, we investigate the changes in the degree of similarity in price structures, using the OECD *Purchasing Power Parities and Real Expenditures* database. Table 4.1 presents some indicative results, showing the twelve country pairs with the most similar price structures and the countries with the least similar ones. Not surprisingly, the countries with similar price structures are all close, highly integrated neighbours of each other (e.g. the Scandinavian countries, the southern European countries and the countries of the D-Mark area), while the dominance of both Turkey and Japan in the low-similarity category underscores their differing economic structure.

Table 4.1. Country pairs with most similar and dissimilar price structures

97. The presence of the countries of the D-Mark area among the countries with highly similar price structures, would suggest that a stable exchange rate regime may contribute to price convergence. Table 4.2 shows that the overall level of price similarity is indeed higher among the D-Mark area countries than among the other EU countries. Prices are actually highly similar across all goods categories, with the possible exception of services. However, similarity in price

levels should be distinguished from convergence. What is relevant for our purpose is whether convergence in the D-Mark area has been stronger, after controlling for initial conditions.

Table 4.2. Developments in price similarity

98. In fact, progress towards increasing price similarity has been relatively low among the D-Mark area countries compared to the other EU-countries, suggesting that relatively far reaching reforms are needed to achieve further price convergence. Table 4.2 also suggests that countries in the D-Mark area already formed a relatively integrated group before the start of the pegged exchange rate regimes. To see whether this result is robust, after correcting for factors such as trade intensity and the initial level of similarity, we present some regressions in Table 4.3 which explicitly test for the presence of a “D-Mark effect”. We look only at this group of countries (excluding Luxembourg) and use the other EU-countries as a control group. Interestingly, the coefficients of the D-Mark dummy variable is always close to the coefficient of the non-D-Mark dummy variable, although the D-Mark coefficient is always higher than for the other countries. This suggests that an important part of the difference in price convergence may indeed be due to catching-up and differences in trade intensity. To test whether the degree of price convergence of Austria, Germany, Belgium and the Netherlands differed from that of the other EU countries, we tested the nul-hypothesis that the coefficient of the D-Mark dummy is equal to the coefficient of the non-D-Mark dummy. An F-statistic was calculated to test this hypothesis for the various sub-periods (1985-1990, 1990-1993 and 1993-1996) and goods categories (corresponding to the specifications one to four in Table 4.3). We find that in only one case, the nul-hypothesis could be rejected at the 5% significance level (but not at the 1% level). In particular, for specification three for the period 1993-1996, the hypothesis that both coefficients are equal could be rejected. This result however, is not very representative. So in the majority of cases, it must be concluded that these D-Mark area countries have not been able to achieve a significantly higher degree of price convergence than other EU-countries.

Table 4.3. Exchange rate stability and price convergence

99. Two possible explanations can be given for this result. First, private agents might not have considered the EMS arrangement (even in the countries with relatively stable bilateral exchange rates) a credible monetary union. Exchange rate uncertainty and a lack of price

transparency may therefore have persisted, with only very limited price convergence as a result. As EMU is a much more credible and irrevocable form of monetary union, it may have a more substantial impact on price convergence. Second, the participation in the EMS arrangement implied a convergence in inflation rates (see below). Inflation rates indeed displayed a significant convergence as the final stage of EMU came closer and closer. Given that price structures were different to begin with, this convergence in inflation rates may have slowed down the pace of relative price convergence. This may also partly explain the result found in Section 1 that the rate of price convergence seems to have slowed down during the most recent period (1993-1996), a result which holds for both D-Mark area countries and non-D-Mark area countries. In any case, whether the lack of incremental price convergence in the D-Mark area is representative of the possible effect EMU may have on prices is an open question. Our results do however cast doubts on the hypothesis that monetary union by itself, will increase competition and therefore price convergence across Europe. Structural reforms seem to be a necessary condition to achieve further progress in this area.

Monetary integration and incentives for reform

100. From a theoretical standpoint, it is optimal for a country to join a currency area under three conditions: demand or supply shocks must be symmetric to those of the other countries participating in the agreement; labour must be mobile across countries; and real-wages must be flexible⁴⁰. However, these conditions should be seen in a dynamic context in which decision rules of private agents and government authorities may respond systematically to changes in the monetary regime. Changes in incentives for private agents and policy makers could lead to modifications in institutions, market mechanisms and even in government approaches to public policy. Hence one cannot keep behavior — such as unions' objective functions — constant while contemplating giving up monetary authority or joining a single currency.

⁴⁰ See Mundell (xxx).

101. Austria and the Netherlands, two countries in the D-mark area, provide historical examples of the possible effect of monetary integration on agents' incentives. Hochreiter and Winckler (1995) find that the optimality conditions for joining a currency area failed to hold in Austria in the late 1970s. However, by looking at the 1980s and early 1990s, they find that wages (and unit labour costs) behaved differently than in the 1970s in the sense that wage settlements responded to low growth and structural problems in the 1980s but rose at a rate which exceeded productivity growth in the 1970s. Due to this wage moderation, unemployment did not rise to the high levels seen in neighboring countries and the variance of real exchange rates, unemployment and the current account balance was low in the 1980s in comparison with other European countries such as Belgium, France and Italy.

102. The Netherlands is another success story in the D-Mark area. Following the Wassenaar Agreement in 1982, progress has been made to reduce the generosity of the social-security system, increasing the flexibility of the labour market and improving the public finances. At Wassenaar, employers' and unions agreed on wage moderation in return for tax cuts. The tax cuts were then financed by cutting down some of the more generous welfare programmes; in particular the matching of any increase in wages with an equal increase in minimum social benefits. In fact, the budget deficit tended to fall in the ensuing years. As a result of these policies, the rate of job creation increased resulting in a steady fall in the unemployment rate. So not only did the Netherlands escape hardship upon pegging its exchange rate to the D-Mark, they made progress towards better labour-market outcomes.⁴¹

103. To what extent are the significant reforms in these two countries linked to their choice to peg their currencies to the Deutsche Mark? To account for a larger pool of country experiences, in Table 4.4 we summarise labour market reforms and institutional changes in EU countries over the 1985-1995 period. We report reforms using two different indicators: the first five columns show "reform accounts": they provide the number of reforms by country over the 1985-1995 period in three main areas (EPL, unemployment benefits and public pensions)⁴²; the sixth column provides the percentage of the recommendations contained in the OECD *Jobs Strategy* implemented by

⁴¹ However, we must note that the employment/population ratio is still fairly low due to low labour-force participation rates. Around 13% of the population is now counted as disabled.

⁴² Public pensions are included to account for the role of early retirement in providing income support to the unemployed.

each EU country over the 1990-1998 period⁴³. The last column shows changes in the level of centralisation/coordination of the bargaining systems following the classification proposed by Calmfors and Driffill (1988).

Table 4.4. Institutional change and reform in Europe (1986-1997)

104. The evidence reported in the table does not lead to clearcut conclusions as to the effects of monetary integration. The mere count of reforms and recommendations suggests that countries participating in the D-Mark and Core-EMS areas have on average implemented a higher number of reforms than other EU countries, providing *prima facie* evidence in favor of a positive effect of monetary integration on the drive for reform. However, when reforms are weighted according to their importance for labour market outcomes, as in the account of the follow-through of OECD recommendations, the evidence is much less clear, with Core-EMS countries showing a weaker reform effort than other EU countries. Finally, although the table suggests that countries in the D-Mark area tend to move away from intermediate levels of coordination/centralisation that are generally thought to lead to inferior labour market outcomes, the evidence is by no means conclusive.

105. Clearly, comprehensive empirical evidence on these issues is difficult to collect and hard to interpret, since institutional changes and reforms are multiform, may differ in intensity and may be implemented and enforced in very different ways. Indeed, what is most relevant is the impact that institutional change and regulatory reform may have had on labour market flexibility and performance. We therefore turn to the analysis of cross-country differences and changes over time in the sensitivity of the macroeconomy to demand and supply shocks, as a proxy for the actual scope and depth of reforms implemented in EU countries. We look first at nominal flexibility and then turn to evidence concerning real rigidities.

⁴³ In the context of the OECD *Jobs Strategy* country-specific recommendations were formulated covering labour market policies, education policies as well as policies affecting the business environment. Progress made in implementing these recommendations is discussed in OECD (1999). In the table, the follow-through rate refers to reforms in the labour market only.

Nominal flexibility

106. When the cost of gathering information and learning about the state of the economy is significant, the optimal strategy followed by firms involves time-dependent rules or contracts. The length of such contracts — be they wage or price-setting rules — is likely to depend on the rate of inflation, the frequency of inflation shocks (proxied by the variance of inflation) and the size of aggregate-demand shocks. The optimal contract length, and the ensuing degree of nominal rigidity, is a decreasing function of the rate and the variance of inflation because the cost of maintaining prices and wages fixed in nominal terms (i.e. the cost of maintaining a suboptimal relative price of output or labour) is higher for a given contract length the higher are the rate and the variance of inflation⁴⁴. On the other hand, larger demand shocks are likely to lead to shorter contract periods and increased nominal flexibility because the larger is the size of demand shocks, the greater are the incentives for firms to revise prices, due to increasing marginal costs of production, and for unions to renegotiate wages, due to decreasing marginal utility of employment and wages (i.e. the convexity of union indifference curves in the real-wage/employment space).

107. Since the loss of monetary independence is likely to affect the rate and the variance of inflation as well as the size of demand shocks, the economy-wide flexibility of nominal wages and prices is likely to be affected by the adoption of a single currency. However, as Calmfors (1998) has pointed out, the sign of the net change is uncertain since one could expect a currency union to result at the same time in a lower and more stable inflation and larger demand shocks. Indeed the historical experience of EU countries suggests that the abandonment of an independent monetary policy has led to both low average rate and low variance of inflation. Figure 4.1 plots the average rate of inflation against the standard deviation of inflation in a sample of OECD countries over the 1981-1998 period. Clearly, D-Mark area countries have had lower and more stable inflation than most of the other countries. *Ceteris paribus*, this would tend to increase the length of contracts, increasing nominal rigidities. However, the loss of monetary independence could also raise the size of aggregate-demand shocks, because monetary policy can no longer be used to counter country-specific disturbances, tending to reduce contract length and thereby

⁴⁴ By contrast, in menu-cost models the effect of higher inflation on the frequency of price adjustment is indeterminate as—within the class of Ss rules—the size of the band of inaction is affected.

raising nominal flexibility. The empirical literature suggests that on balance the second effect tends to dominate, with the loss of monetary independence often resulting in increased flexibility. Bayoumi and Eichengreen (1993) found that wage changes were more rapid during the period of the gold standard; Anderton and Barrell (1993) found increased wage flexibility after Italy joined the EMS; and Muet (1996) found increased flexibility in France during the same period.

Figure 4.1. Inflation patterns in OECD countries

108. An increase in nominal flexibility is likely to amplify movements in wages and prices and lower the effect of demand shocks on real variables, affecting the magnitude of the business cycle. First brush evidence on the reaction of OECD economies to demand shocks can be gathered by looking at the cyclical variability of unemployment. *Ceteris paribus*, economies enjoying a wider flexibility of nominal wages and prices should display a lower cyclical variability of unemployment. Figure 4.2 shows the variance of the changes in unemployment, a proxy for its cyclical behaviour, over the 1960-1980 and 1981-1998 periods. In countries along the diagonal the cyclical variability of unemployment has remained the same in the two periods, while in countries below (above) the diagonal the variance has increased (decreased) in the most recent period. It is interesting to note that, with the exception of Germany (which *had* an independent monetary policy and which suffered from the shock of re-unification), countries in the D-Mark area succeeded in keeping in both periods the cyclical variability of unemployment at a relatively lower level than in most other OECD countries.

Figure 4.2. Variability of unemployment and unit labour costs

109. Another way to check whether monetary integration increased nominal flexibility is to compare the reaction of real output to demand shocks in countries participating in exchange rate stability zones and in other OECD countries. Following Ball, Mankiw and Romer (1988) we use the change in log nominal GDP as a measure of demand shocks and estimate their impact on real GDP to measure the degree of nominal flexibility⁴⁵. We estimate the following equation for a sample of 19 OECD countries ($i = 1, \dots, 19$) over the 1960-1998 period, where t is a time trend, y is the log of real GDP, and Y the log of nominal GDP:

$$y_t = a_0^i + a_1^i t + a_2^i \Delta Y_t + a_3^i y_{t-1} \quad [1]$$

110. Table 4.5 shows the resulting estimates of the sensitivity of real output to demand shocks (α_2), our measure of nominal rigidity, for two sub-periods, before and after the creation of the EMS⁴⁶. The estimated coefficients should be taken with caution because, due to the small number of degrees of freedom, they are quite sensitive to the period covered and they are often not significant at conventional levels. However, a few (prudent) considerations can be made. First, countries belonging to the D-Mark area seem to be characterised by higher nominal rigidity than elsewhere in the OECD. Second, relative to many other countries, their degree of nominal rigidity appears to be more stable over time. Therefore, there is no prima facie evidence that membership in a currency area has fundamentally changed the way the D-Mark economies adjust to nominal shocks⁴⁷.

Table 4.5. Sensitivity to demand shocks

111. Since the D-Mark countries have had lower and more stable inflation, it is possible that this nominal convergence may explain the higher level of nominal rigidity, due to the effect of a stable nominal environment on the features of wage contracts (see above). We checked this conjecture by running a cross-country/time-series regression of the estimated nominal sensitivity coefficients (α_2) in the 1960-1980 and 1981-1998 periods on the corresponding average rates and variances of inflation⁴⁸. The results showed that the variance of inflation explains a large amount of the variance of the sensitivity across countries and across the two time periods, with a lower variance being associated to higher nominal rigidity. To further explore the channels through which nominal convergence can increase nominal rigidity, we looked at the simple correlations between the estimated sensitivity coefficients and some of the features of wage contracts in

⁴⁵ The implicit assumption is that the aggregate demand curve is unit elastic, making the product of prices (GDP deflator) and real output independent of supply shocks.

⁴⁶ The EMS was created in 1979 with 8 participating countries: Germany, France, the Netherlands, Belgium, Italy, Denmark, Ireland and Luxemburg. However, at end 1979 there was a reajustment of the parities.

⁴⁷ Recursive estimates of equation [2] also suggest that the evidence of changes in nominal flexibility in the EMS zone is weak.

⁴⁸ We estimated the following equation using the 38 observations:

$$a_2^i = b_0 + b_1 p + b_2 s_p + b_3 \Delta Y + d_{EMU}$$

The coefficient of σ_π had a negative sign and a t-statistic of -3.7. The coefficients of the other variables were insignificant. The EMU dummy was included to check whether participation in the hard-currency area would have effects on nominal flexibility independent of those implied by nominal convergence.

OECD countries, such as their length, their synchronisation and the presence of indexation. The correlations had the expected signs, with the degree nominal sensitivity/rigidity being positively related to contract length ($R^2 = 0.32$) and negatively related to indexation ($R^2 = -0.55$) and synchronisation ($R^2 = -0.20$). However, the only statistically significant correlation was found with indexation.

112. We can conclude that, by lowering the variance of inflation, participation in the D-Mark area is likely to have made more attractive contractual arrangements such as lengthy and unindexed contracts, favoring a relatively high degree of nominal rigidity. In such a scenario, the effect of nominal convergence seems to have prevailed over that of larger demand variability in determining the behaviour of unions and firms. However, we were unable to find hard evidence that participation in the D-Mark area actually *changed* the behaviour of agents. As noted above, if anything, the D-Mark countries appear to have enjoyed more stability in the sensitivity of real output to nominal shocks than other countries, a result that was also confirmed by the inspection of the recursive estimates of the sensitivity parameters. These conclusions must be taken cautiously, however, since they hinge on our measures of nominal rigidity, which are relatively poorly estimated.

Real rigidities

113. Cross-country differences in unemployment are widely believed to be grounded in differences in the rates of structural unemployment (OECD, 1997 and 1999). If high European unemployment rates are largely structural, it is particularly relevant to establish whether giving up monetary independence is likely to lead to labour and product market reforms and changes in labour market institutions having a beneficial effect on structural unemployment. On purely theoretical grounds, the question is unsettled. The potential effects of monetary union on labour-market reform and institutions are essentially of two types (Calmfors, 1998). First, there may be incentives for policy makers to change legislations and regulations, such as the level and duration of benefits, eligibility criteria and employment protection rules. Second the strategies of unions and employers may change as a result of the modification in the policy environment determined by the loss of monetary independence.

114. As to incentives for labour market reform, there are several possible arguments leading to either positive or negative conclusions concerning the effects of the EMU. On the positive side, there are three main lines of reasoning. The first has to do with hysteresis effects. To the extent that such effects are significant, it is in the interest of policy-makers concerned by unemployment levels to minimise the extent to which nominal shocks tend to turn into real fluctuations. Since country-specific shocks will tend to be larger when the monetary policy instrument is lost, EMU membership should provide additional incentives to reduce real rigidities through structural policies⁴⁹. The second is based on the observation that, once domestic monetary policy cannot be used anymore to buffer country-specific shocks, the cyclical variations in unemployment are likely to be larger, leading to a higher risk of the occurrence of very bad outcomes (Calmfors, 1998). Under the assumption that policy-makers are risk averse (e.g. because voters are particularly sensitive to bad outcomes), incentives to implement structural reforms will increase: successful reforms will lower the structural unemployment rate, improving the “risk-return” outcome. The third builds upon the assumption that the single currency, by increasing price transparency, multiplies the possibilities for consumers to arbitrage across countries, increasing the competitive pressures placed on firms operating in EMU countries⁵⁰. As a result, relative labour costs will be a decisive factor in deciding on the location of firms within the EMU area, and governments will be keener on implementing those structural reforms that reduce labour costs relative to other countries participating in the currency union (Bean, 1998).

115. Negative arguments are essentially of two kinds. The first is based on variants of the “inflation bias” argument (Barro and Gordon, 1988)⁵¹. For a country participating in the EMU, the incentive to implement structural reforms in order to reduce the inflation bias (which is an increasing function of unemployment) is smaller since, by definition, having abandoned monetary independence there is no more such bias at the national level (Sibert and Sutherland, 1997;

⁴⁹ The popular belief that the loss of the exchange rate instrument would imply by itself that there is no alternative (TINA) but to implement structural policies is implicitly based on a similar argument. Indeed, unless hysteresis effects are significant, exchange rate depreciations are no substitutes for structural policies, since they can only smooth out cyclical unemployment with no effect on its structural component.

⁵⁰ The evidence on price convergence in the D-Mark area presented above suggest, however, that the effect of price transparency on competitive pressures cannot be taken for granted.

⁵¹ Inflation bias occurs when the incentive to inflate is larger at higher rates of structural unemployment (because voters and policy makers do not differentiate between a high cyclical and a high structural unemployment). Therefore, the pressure to undertake fundamental labour-market reforms is higher in countries which have a discretionary monetary policy as this is likely to reduce the temptation to inflate.

Calmfors, 1998) and, on the other hand, the possible bias at the EU level is not very significant both because the ECB is likely to be less inflation-prone than the domestic central bank and because the ECB determines monetary policy on the basis of EU-wide developments⁵². Therefore, to the extent that an inflation bias existed outside the EMU, the single currency would weaken incentives for reforms aimed at reducing structural unemployment. The second is based on the assumption that there is complementarity between structural and monetary policies (Lindbeck, 1996; Calmfors, 1998). Successful reforms lead to a fall in equilibrium unemployment but actual unemployment only gradually converges to this new equilibrium. If the beneficial results of labour market reform can be accelerated by the shrewd use of demand management policies, the loss of monetary independence will make less attractive for policy-makers (whose horizon is limited by their electoral term) to pursue structural policies.

116. Similar arguments can be used to analyse the reaction of unions to monetary unification (Cukierman and Lippi, 1997 and 1999). A centralised labour union that dislikes inflation is likely to restrain real-wage demands in order to keep unemployment down and hence reduce the incentive to inflate. In a monetary union, this tendency is reduced as the union now has less to fear from a centralised central bank both because it is likely to be less inflation prone than the national bank and because it takes into account unemployment in all member countries⁵³. The EC (1998) argues that this negative effect of EMU on wage restraint by a centralised union is likely to be more significant for large and relatively closed countries, since they will be able to externalise more of the inflation effect while at the same time incurring relatively minor consequences in terms of loss of competitiveness vis à vis the other countries. It could also be argued that, by increasing the externalities caused by differential behaviour of unions across countries, EMU could change the optimal locus of wage bargaining, from the national to the EU level. For instance, a large union could induce foreign companies to relocate in its country by pursuing a strategy of wage moderation, thereby raising domestic employment at the expense of foreign employment. This could call for some form of cross-border coordination in the wage formation

⁵² In the EMU high structural unemployment in one country imposes a negative externality in the form of an inflation bias on other countries, and a low level of structural unemployment in any one country imposes a positive externality on other countries in the monetary union because of a reduced inflation bias. The externality arises because of the centralised nature of monetary policy and the decentralised nature of labour-market policy.

⁵³ This is again an externality problem. A large union in any one member country imposes a negative externality on other countries by demanding higher real wages resulting in higher domestic unemployment. The externality is felt in higher rates of inflation in the other countries. Similarly, there is an external benefit to wage moderation by the large, national union.

process, at least among countries characterised by centralised bargaining. At the same time, as argued by Gros and Hefeker (1998), there might also be a tendency to coordinate wage-setting across countries on a sectoral basis, to the extent that sector-specific shocks dominate at the EU level.

117. In conclusion, from a purely theoretical point of view, it is unclear whether EMU will induce governments and unions to pursue structural reforms and changes in labour market institutions that would favor the reduction of European structural unemployment. It is possible that a combination of positive and negative incentive mechanisms could be operating, leaving the net effect on unemployment uncertain. Although the issue can hardly be settled empirically, we can try once again to use the experience of those European countries that pegged their currency to the D-Mark as a guidance to the likely net effects of a monetary union on incentives for structural reform and institutional change.

118. One way of dealing with this issue is to focus on the sensitivity of unemployment to demand or supply shocks and on the degree of persistence of the resulting changes in unemployment as proxies for the degree of real rigidity present in the economy. Real rigidity may be caused by both the lack of real wage flexibility, i.e. a steep wage setting curve, and the lack of product market competition, reflected in a steep labour demand curve (see Section 2). Taking an agnostic stand on the nature of the shocks affecting unemployment (the productivity slowdown, biased technological change - between capital and labour or skilled and unskilled labour - , oil-price increases, high real interest rates or the behaviour of markups, to name a few) we specify the following reduced-form equation for each country in our sample ($i = 1 \dots 19$):

$$\Delta u_{it} = \alpha_i (a_i + \gamma_i D - u_{it-1}) + e_{it} \quad [3]$$

where u is the rate of unemployment, and D is a vector of dummy variables, one for each of the years 1961-1998. The time dummies capture global shocks in each period, while the coefficient γ measures the sensitivity of the unemployment rates to these shocks (i.e. the degree of real rigidity). We make no assumption about the nature of these shocks and estimate them directly from the unemployment series itself. The coefficient α measures cross-country differences in average unemployment while λ measures the persistence of changes in unemployment over time. The data were pooled and the equation was estimated by non-linear least squares.

119. In Figure 4.3 we plot the estimated global shocks. There are three main episodes of adverse shocks, either in the form of a negative demand or a supply shock. These are the mid-1970s (oil price shock), the early 1980s (interest rate shock) and the early 1990s (high interest rates among other things). We are not primarily interested in the nature of these shocks but we wish to find out whether the reaction of unemployment in different countries can be explained by their labour and product market characteristics. As mentioned above, the value of the sensitivity coefficient may reflect rigidities in both the labour and the product market. Labour market reform (e.g. changes in labour market institutions, welfare programmes and/or legislation on employment protection) then may affect the sensitivity of unemployment to shocks by making the wage curve flatter, i.e. by decreasing the degree of real wage rigidity. On the other hand, product market reform may act to partially offset the sensitivity to negative supply shocks by making labour demand more elastic and shifting it outwards (see Section 2).

Figure 4.3. Shocks to unemployment

120. To cast light on the determinants of real rigidity, we follow Nickell (1998) and regress the estimated values of unemployment sensitivity (γ) and persistence (λ) on indicators of labour market institutions (union coordination, union density), labour market regulations (unemployment-benefit replacement ratio, duration of benefits, employment protection legislation) and product market regulation (the summary indicator presented in Section 3)⁵⁴. To check for the possible effects of monetary integration on real rigidity, over and above those originating from existing institutions and regulations, we follow the same approach as in the previous analysis of nominal flexibility and also include a dummy for Core-EMS countries. The dummy may account for differences in the policy approaches and/or the attitudes of employers and unions which are not captured by our institutional and regulatory indicators. It may also account for the effects of increased price transparency on competitive pressures faced by entrepreneurs (this issue is dealt with in more detail in the next sub-section).

121. The results of the cross-country regressions (Table 4.6) suggest that labour market institutions and regulations have significant effects on both unemployment sensitivity and persistence, confirming earlier findings by Scarpetta (1996), Layard et al. (1991) and Nickell

⁵⁴ Data on labour market institutions and regulations was drawn from Nickell (1998).

(1998). As expected, generous unemployment benefits and lack of bargaining coordination increase sensitivity, while restrictive EPL translate into a higher degree of persistence. Interestingly, restrictive product market regulations also have a significant impact on sensitivity, reflecting their negative impact on product market competition and, hence, on labour demand elasticity. This confirms, in a dynamic framework, the results of the previous section.

Table 4.6. Determinants of real rigidity

122. On the whole, Core-EMS countries tend to have a regulatory environment which is not favorable to flexibility (generous benefit systems, strong employment protection, high union coverage), however their wage formation process tends to be centralised and coordinated, implying a low level of real wage rigidity. On this count it is noteworthy that our regression results associate membership in the Core-EMS with a lower sensitivity of unemployment to shocks. Although we are not in a position to gauge the net effects of participating in a hard currency area, the results suggest that monetary integration brings about changes in policies and behaviours that enhance the real flexibility of the economy.

123. We further explored the possible consequences of monetary integration for policies and institutions affecting real flexibility by checking the stability of the unemployment equation over time and by relating directly changes in unemployment to a summary measure of the reform effort made by OECD governments. The stability analysis suggested that structural breaks in the sensitivity and persistence of unemployment can be detected at the time of the creation of the hard currency area in some countries (Germany, the Netherlands and, albeit at higher significance levels, Austria) but not in others (Belgium, France)⁵⁵. Finally, using the estimates of the determinants of unemployment sensitivity (Table 4.6) we constructed a summary indicator of changes in labour market institutions and policies and tried to relate it to observed differences in

⁵⁵ Structural stability was investigated by estimating the following linearised version of equation [3] (using the estimated global shocks as hard data), which also includes a domestic inflation shock to assess the level of nominal-price rigidity (see Layard et al., 1991 and Phelps, 1994):

$$\Delta u_{it} = f_i^1 + f_i^2 u_{it-1} + f_i^3 D + f_i^4 \Delta p + e_{it}$$

where ϕ^2 measures the persistence of unemployment, ϕ^3 the sensitivity to global shocks and ϕ^4 the sensitivity to nominal shocks. Among Core-EMS countries, Chow tests of a break in 1980 were significant at 5 per cent levels for Germany and the Netherlands and at 15 per cent levels for Austria.

average unemployment rates before and after 1980⁵⁶. While the indicator of reform effort appeared to be negatively related to the change in average unemployment rates in the Netherlands and, to a lesser extent, Belgium, the relationship did not hold for the other Core-EMS countries. Overall, the cross-country correlation between our indicator and changes in unemployment was very weak.

⁵⁶ The indicator was defined as:

$$\text{reform} = - (0.08*\Delta(\text{repl. ratio})+0.98*\Delta(\text{ben. duration})+0.02*\Delta(\text{union dens.}) - 1.45*\Delta(\text{union coord.}))/2.53).$$

Product market regulation could not be included because it is only observed for one period.

Table 4.1: Country pairs with most similar and most dissimilar price structures, all goods, 1996

Twelve most similar price structures (Similarity index >90,7)		
Belgium-Luxembourg	Norway-Sweden	Belgium-France
Italy-Spain	Austria-France	Belgium-Netherlands
Belgium-Germany	Denmark-Norway	Austria-Germany
France-Germany	Denmark-Sweden	Austria-Belgium
Twelve least similar price structures (Similarity index <70)		
Japan-Turkey	Denmark-Turkey	Sweden-Turkey
Norway-Turkey	Finland-Turkey	Austria-Turkey
France-Turkey	Germany-Turkey	Canada-Japan
Luxembourg-Turkey	Japan-USA	Belgium-Turkey

Table 4.2: Price similarity indices at the basic goods heading, 1985-1996

	1985	1990	1993	1996	Change 1985-1996
D-Mark area					
All products	90,0	90,7	90,4	90,8	+0,9
Consumer goods	91,2	91,7	92,1	92,5	+1,3
Equipment goods	91,0	92,0	90,2	90,1	—0,9
Construction	92,5	90,7	90,4	90,8	—1,7
Services	85,7	87,8	86,9	87,0	+1,4
Energy	91,6	88,9	86,4	91,8	+0,3
Other EU					
All products	81,2	80,7	84,0	84,0	+2,8
Consumer goods	82,2	81,3	85,4	85,3	+3,1
Equipment goods	88,3	87,8	88,5	89,7	+1,4
Construction	84,7	84,5	85,5	84,3	—0,4
Services	74,3	75,0	78,7	78,8	+4,5
Energy	83,4	77,3	76,4	77,9	—5,5

D-Mark area = Belgium, Germany, Luxembourg, The Netherlands, Austria.

Other EU = ten remaining EU countries.

Table 4.3: Estimates of bilateral similarity equations including EMS-dummies.
(Dependent variable: change in price similarity over 1985-1996)

Specification/ Independent variables	1	2	3	4
Initial similarity	-0,3 (-6,9)	-0,5 (-20,0)	-0,6 (-20,9)	-0,3 (-9,4)
Expenditure share	1,4 (1,1)	1,5 (1,9)	4,0 (3,8)	3,6 (2,1)
Trade intensity	-0,3 (-1,4)			
D-Mark dummy	4,5 (2,8)	4,6 (3,8)	5,6 (5,4)	3,4 (2,4)
Other EU dummy	3,8 (6,6)	2,6 (6,4)	4,5 (12,3)	3,1 (6,6)
Construction		-0,4 (-0,6)		
Equipment goods		3,3 (5,1)		
Energy		-6,3 (-10,4)		
Services		-2,6 (-4,0)		
High NTB			2,2 (5,2)	
Medium NTB			1,6 (3,7)	
Tradable				0,5 (0,9)
constant	24,3 (6,6)	39,6 (19,8)	47,1 (21,2)	21,7 (9,9)
No. of observations	210	1050	630	420
F-statistic	16,1	77,7	87,8	22,2
F-test for equality DM- Non-DM coefficients	0,18	2,65	1,15	0,04

Notes: the D-Mark dummy has the value one if the dependant variable corresponds to two countries from the following group: Austria, Belgium, Germany and the Netherlands. The Other EU dummy has the value one for all pairs of EU countries not belonging to the core EMS-group. The 5%-significance level for the equality of DM and non-DM coefficients is 3,84.

Table 4.4 Institutional change and reform in Europe (1986-1997)

	Number of reforms ¹ (1986-1997)				Follow-through of OECD recommendations ² (1990-1998)	Changes in bargaining systems ³ (1985-1997)	
	EPL	NET BENEFITS	PENSIONS	Total	Per cent of total	Centralisation/coordination in	
						1980s	1990s
Austria	0	4	2	6	42.4	High	High
Belgium	1	5	2	8	45.4	Intermediate	Intermediate
Germany	3	4	2	9	36.8	High	High
The Netherlands	2	5	5	12	61.2	Intermediate	High
Total D-Mark Area	6	18	11	35			
France	2	2	3	7	19.7	Intermediate	Intermediate
Core-EMS Area	8	20	14	42			
Denmark	1	3	1	5	59.4	High	High
Finland	1	4	4	9	41.2	High	Intermediate
Greece	3	0	2	5	39.4		
Ireland	1	4	0	5	64.5	Intermediate	High
Italy	4	2	5	11	47.9	Low	High
Portugal	3	0	1	4	26.9	Intermediate	Intermediate
Spain	3	3	1	7	35	High	Intermediate
Sweden	2	5	3	10	26	High	Intermediate
United Kingdom	1	4	1	6	84.8	Intermediate	Low
Other EU countries	19	25	18	62			
Total EU Area	27	45	32	104			
Averages per area:							
D-Mark area	1.5	4.5	2.8	8.8	46.5		
Core-EMS Area	1.6	4.0	2.8	8.4	41.1		
Other EU countries	2.1	2.8	2.0	6.9	47.2		
Total EU Area	1.9	3.2	2.3	7.4	45.0		

1. RodolfoDeBenedetti Foundations. Reforms increasing labour market flexibility or reducing the generosity of the unemployment benefit/pension systems.

2. Per cent of recommendations implemented over the period (OECD, 1999).

3. Elmeskov et al. (1998).

Table 4.5. Sensitivity to demand shocks

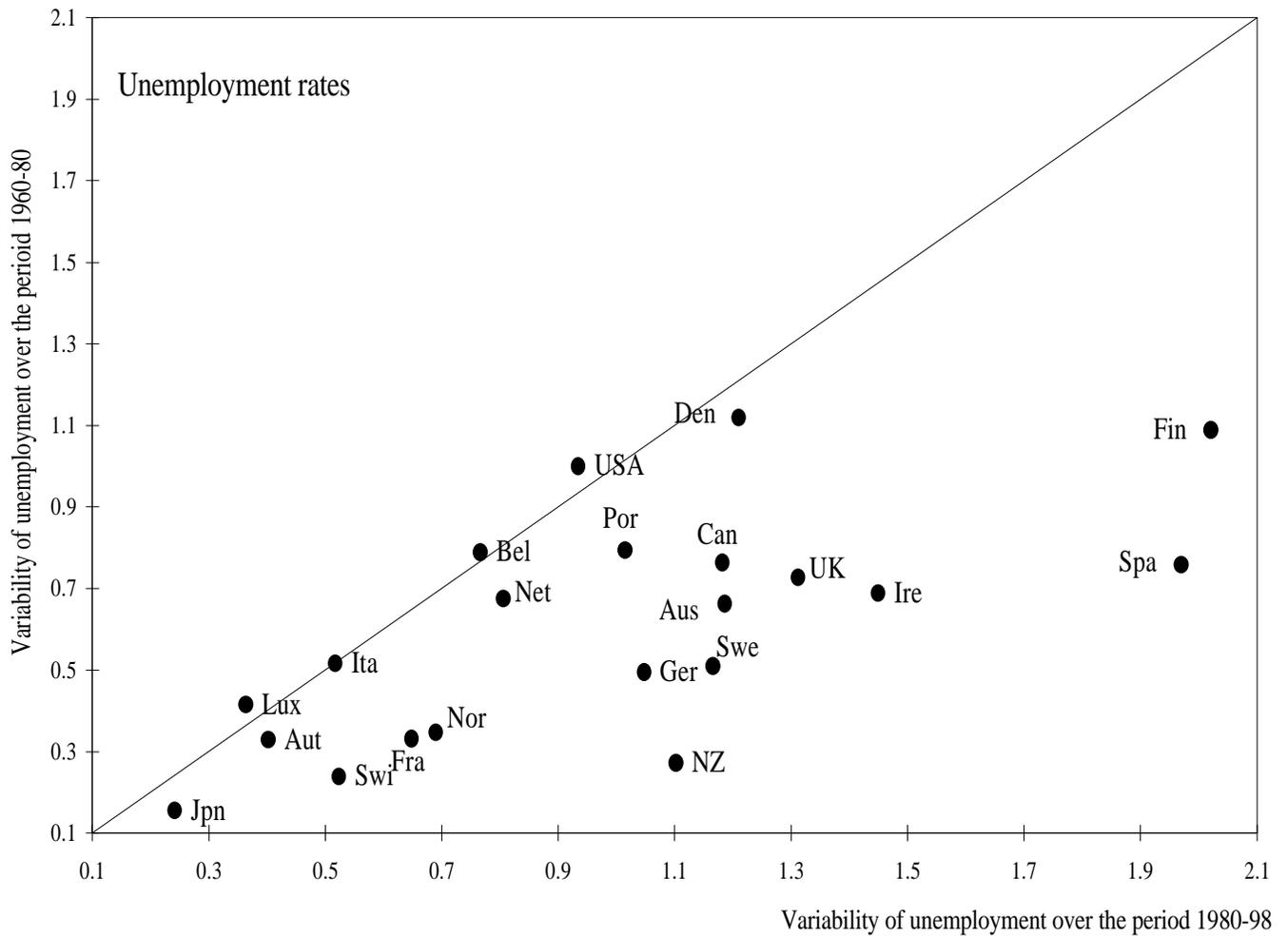
Country	Time periods		
	60-80	81-98	60-98
D-Mark area			
Germany	0.69	0.79	0.77
Austria	0.80	0.83	0.73
Belgium	0.72	0.75	0.64
Netherlands	0.62	0.52	0.55
Core-EMS			
France	0.28	0.35	0.26
Other OECD			
Australia	0.33	0.61	0.43
Canada	0.40	0.68	0.51
Denmark ^{**}	0.99	0.48	0.69
Finland [*]	0.46	0.75	0.53
Ireland	0.19	0.59	0.12
Italy	0.19	0.06	0.21
New Zealand	0.38	0.47	0.21
Japan [*]	0.33	0.79	0.37
Norway	-0.01	0.20	0.24
Portugal [*]	0.44	0.39	0.18
Spain	0.23	0.86	0.22
Sweden	0.35	0.76	0.39
U.K. [*]	-0.04	0.65	0.07
U.S.	1.26	0.84	0.69
Average	0.46	0.60	0.42

*) difference between time periods significant at 5% level, **) difference significant at 10% level.

Table 4.6. Determinants of real rigidity

Institutional and regulatory indicators	Unemployment parameter			
	<i>Sensitivity to shocks</i>		<i>Persistence of shocks</i>	
	<i>(g)</i>		<i>(l)</i>	
	<i>Estimate</i>	<i>t-ratio</i>	<i>Estimate</i>	<i>t-ratio</i>
<i>Constant</i>	-8.80	-2.2	0.62	5.2
<i>Replacement rate</i>	0.11	1.9	-	-
<i>Benefit duration</i>	1.30	2.7	0.03	1.7
<i>Union density</i>	0.002	0.1	0.001	1.1
<i>Union coordination</i>	-2.09	-1.6	-	-
<i>Employment protection leg.</i>	-0.04	0.1	0.06	3.2
<i>Product market regulation</i>	2.53	1.9	-	-
<i>Core-EMS dummy</i>	-1.81	-2.4	-	-
<i>Obs.</i>	19		19	
<i>R²</i>	0.67		0.55	

Figure 4.1. Cyclical variability of unemployment rates¹



1. The cyclical variability of unemployment is measured by the standard deviation of yearly changes in actual unemployment rates.

Source : OECD

**Figure 4.2. Inflation patterns in OECD countries
1981-1998**

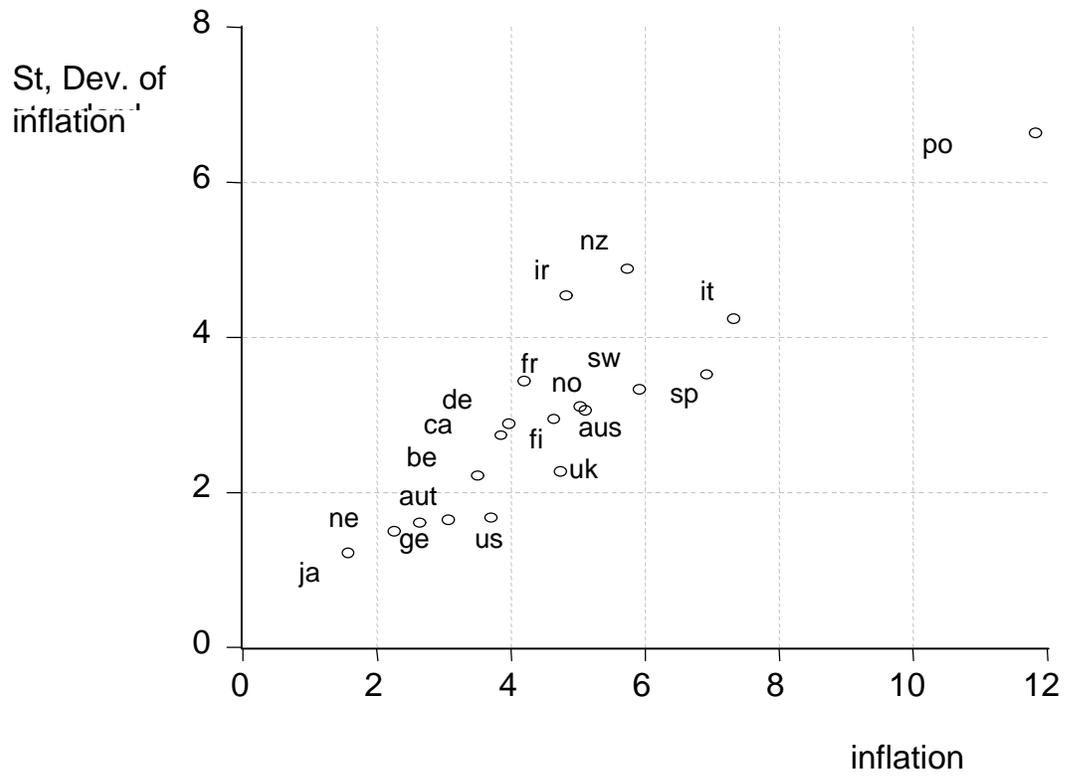
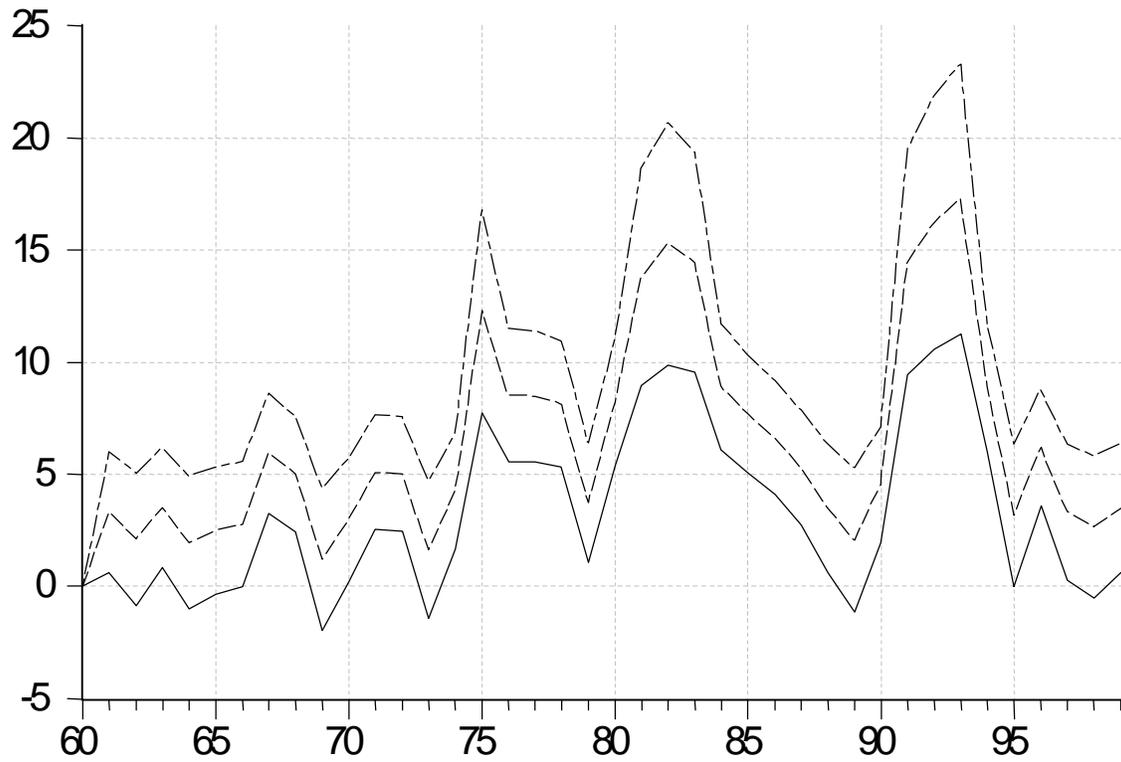


Figure 4.3. Global Shocks to Unemployment
(with 95% confidence interval)



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