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# Labour Markets in EMU

## What has changed and what needs to change

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### Abstract:

This paper reviews theoretical and empirical aspects of the interaction between Europe's Economic and Monetary Union and recent labour market developments. Policies meant to increase and stabilize labour incomes also tend to reduce employment and productivity: theory suggests that the latter effects should be sharper and more relevant within an integrated market area, making it harder for National policy makers to address the consequences of financial and other market imperfections. Empirical patterns of policy and outcome indicators in member and non-member countries of EMU are consistent with that theoretical mechanism. In the data, tighter economic integration is associated with better employment performance, substantial deregulation, sharper disemployment effects of remaining regulatory differences, and somewhat higher inequality and larger private financial market volume.

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# 1. Introduction

Labour market policies have desirable and undesirable implications along tradeoffs between employment and unemployment on the one hand, unemployment benefits, wage levels, and wage inequality on the other. The position and shape of the relevant tradeoffs and policies choices along them both depend on the structural and political characteristics of countries. Economic integration is an important source of change in both respects, and European Economic and Monetary Union (EMU) might influence National labour market policies and outcomes through a variety of channels. Policymaking, like markets, is far from perfect, and need not properly take into account all of its implications within and across countries. Loss of alternative macroeconomic instruments can overcome resistance to reforms of labour market institutions. In the “there-is-no-alternative” (TINA) view, monetary union could force reform of “bad” policies, facing national policymakers with the consequences of inefficient regulation and uncompetitive wage setting practices, and foster wage moderation as closure of devaluation “escape routes” faces wage setters with clearer and sharper employment costs. Loss of monetary policy independence, however, could instead release wage demands that were kept in check by the threat of tough monetary policy reactions at the national level. And resistance to reform may remain strong if labour market policies are perceived to protect households’ income from uninsurable risk, a goal that may be more important and become elusive when labour markets are subject to international competitive pressures that introduce new risks and make it difficult for national policymakers to implement policies aimed at correcting market imperfections.

This paper brings such theoretical perspectives to bear on empirical policy and outcome patterns outcomes before and after EMU. If policy making processes are shaped by sharper disemployment effects and more damaging efficiency losses in more tightly integrated economies, EMU should be associated with labour market deregulation. To the extent that reforms take time and are at least partly unrelated to the changing effects of policies, we also expect labour market policies to have stronger effects on unemployment and employment in more open economies. And if regulation aims at equalizing and smoothing labour income, reforms should be associated with higher inequality and more intense access to private financial markets as well as with lower unemployment and higher employment rates.

Section 2 of the paper characterizes desirable and undesirable aspects of labour market policies and discusses how their effects and objectives may become more or less important with international economic integration. Policy may aim at changing the distribution of income between labour and other factors of production while inefficiently reducing the amount of output produced by available resources, or at

correcting market imperfections, improving protection against risks, and fostering incentives \*to undertake human capital investments. Economic integration changes the position and shape of the relevant tradeoffs in ways that worsen the undesirable side effects of labour market policies. And policy's ability to target their desirable effects is further weakened by the fact that, as each policymaker only considers costs and benefits within her own constituencies, uncoordinated policy choices differ from those that would be chosen by political interactions at the level of the integrated economic area. As a number of opposing tendencies may be at work in theory, Section 3 examines the empirical question of how in practice EMU has affected labour market policies and outcomes. A broad range of formal comparisons of policies and outcomes across groups of EMU, EU, and other countries uncovers evidence of an association of EMU with deregulation and higher employment. The evidence also confirms that economic integration strengthens the negative effects of labour market policies. For example, labour tax rates do appear to depress employment more in the EMU portion of the available sample. If this is what drives reforms, the intended effects of labour market policies should also become less apparent in the data. To see whether any price has to be paid for better employment performance, and whether other concurrent developments also affect outcomes, Section 4 studies the empirical relationship between EMU, inequality, and financial market development. Section 5 concludes discussing the policy implications of the theoretically plausible pattern of empirical results, focusing in particular on the sustainability of economic integration in the absence of international policy coordination or of access to efficient financial markets for purposes of household consumption smoothing.

## **2. Labour market policy and economic integration**

Many labour market policies reduce employment and increase unemployment but, of course, that is not their primary purpose. When financial markets and/or public redistribution schemes are imperfect, inaccessible, or ineffective, then minimum wages, collective bargaining, unemployment insurance, and employment protection legislation can target income redistribution across individuals and over time. In doing so, they cannot generally avoid loss of productive efficiency: unemployment insurance and employment protection tend to shift labour into unemployment, and to remove individual mobility incentives to allocate labour where it would be most productive. This section discusses how labour market regulation's desirable and undesirable effects depend on an economy's structure and, in particular, on the extent of international economic integration.

## **2.1. Motivation and effects of labour market policy**

Policy interferes with *laissez faire* in labour markets for a variety of reasons, and with a variety of microeconomic and macroeconomic effects (see Bertola, 1999, and Arpaia and Mourre, 2005, for reviews of the theoretical and empirical literature). Difficult access to financial markets and limited ownership of non-labour income flows can explain why workers find it useful to increase wages and decrease employment even though that decreases total production and other agent's income.

Financial market imperfections can similarly support other types of labour market policies. Much as it would be desirable for households to obtain insurance against job loss, private markets cannot supply it as easily as insurance against earthquakes. Job loss, like serious health problems and other life-shaping events, can result from the individual's own behaviour as well as from objective circumstance. To the extent that the former cannot be observed and the latter are hard to verify, an insurance contract specifying the circumstances where a worker would be entitled to compensation when fired would be exceedingly complex to write, and essentially impossible to enforce privately. Workers covered by private insurance contracts would not work as hard, and would be fired so much more promptly than uninsured workers as to make insurance either unprofitable for the issuer, or too costly for purchasers.

Governments have obvious enforcement advantages (and indeed supply law and contract enforcement services to market interactions), and may exploit better information about individual circumstances and interactions across agents. When market interactions cannot exploit sufficiently broad and reliable information, taxation of lucky individuals and payment of subsidies to unlucky ones can potentially fulfil the same need for insurance as missing financial contracts. If it does succeed in serving the same purpose that markets would pursue, redistribution need not decrease productive efficiency, and may well increase it if they encourage risk-taking behaviour. For example, unemployment insurance, by allowing risk-averse workers to prolong their search, improves the productivity of the job they will eventually accept (Acemoglu and Shimer, 1999).

But policies face tradeoffs, because they could unambiguously improve all aspects of welfare only in very unrealistic circumstances. There is no guarantee that efficiency is the only goal of policymakers, because political decision processes are also shaped by inefficient rent-seeking incentives. And, even more importantly, the information problems that prevent financial markets from providing insurance also imply efficiency losses from imperfect government policies. Workers will not work as hard to avoid job loss and to find new jobs when they are insured against unemployment, and making it difficult for employers to fire redundant workers stabilizes workers' labour income but also slows down labour reallocation towards more productive jobs, thus reducing production and profitability.

The simplest and most familiar illustration of the impact of labour market policies is that shown in Figure 1. If workers faced by a downward-sloping labour demand function only care about the aggregate wage bill, they are collectively better off when the wage is set at a level higher than that which equates supply and demand, and employment is correspondingly lowered: working is a matter of indifference at the margin in competitive equilibrium, and as wages become discretely higher (along the demand curve) than the opportunity cost of working (along the supply curve) the lower welfare of workers who fall back on that outside opportunity is more than compensated by the higher wage earned by the workers who remain employed, up to a point that is reached sooner when labour demand is flatter.

The shape of labour supply is also relevant to the effects of policies. As discussed by Bertola, Blau, and Kahn (2007) policy wedges between labour demand and labour supply are associated with sharper employment effects but smaller worker-welfare losses when labour supply is flatter. This can explain why labour market regulation tends to cause larger employment declines for worker groups with relatively elastic labour supply, such as women and youth. Of course, a variety of other factors also affect employment rates of different demographic groups, and it will be important to take them into account when analyzing theoretical and empirical implications of economic integration below.

## **2.2. Economic integration and the impact of policies**

A basic implication of international economic integration for the configuration and performance of labour markets is simply stated and illustrated. Trade and factor mobility increase the elasticity of employers' reactions to labour costs. As shown in Figure 2, a flatter (more elastic) labour demand relationship implies greater employment losses for any given wedge inserted between labour demand and supply, such as those implied by legal or contractual constraints that prevent the unemployed from underbidding employed workers, or by payroll taxation funding non-employment subsidies, such as pensions or unemployment benefits or other welfare transfers. Lower employment, up to a point, still increases aggregate labour income (to be distributed across workers in the form of transfers within families and over their lifetime as well as of formal unemployment or pension benefits). But the smaller wage gains implied by flatter labour demand reduce the positive (for workers) effects of labour market policies.

Further, efficiency losses from these and other policies are more damaging when production choices can react more promptly and more widely to them. For example, employment protection stabilizes labour incomes at the expense of production efficiency and profits, as it shifts on firms the labour income risk that could but is not shared in financial markets or unemployment insurance schemes and slows labour reallocation (Bertola, 2004). The price to pay for labour income stability is higher when lower profits imply capital outflows, or international shocks require more frequent and intense labour reallocation.

Higher elasticity of labour demand is a theoretically and empirically plausible consequence of economic integration (see OECD, 2007, for empirical evidence). It is not its only consequence, however, and economic integration has broader implications for the desirability and feasibility of labour market policies. Whether and the extent to which economic integration tends to increase the elasticity of labour demand depends on modelling details, on the structure of economic interactions, and on concurrent technological and cultural trends which may also affect the position and shape of labour supply.

While economic integration effects on demand elasticity should be most pronounced in tradable sectors of the economy, labour market outcomes in non-tradable sectors may be driven by labour supply developments, such as more intense unskilled immigration and increased female labour supply participation. However deindustrialization trends, foreign direct investment patterns (Scheve and Slaughter, 2004), and new ways to trade service components of traditional production processes (Baldwin, 2006) blur the traditional distinction between tradable and nontradable goods, and make it difficult to assess the interaction between sectoral labour demand patterns and demographic labour supply developments,

As integration tends to foster efficiency of employment, it increases the level as well as the cost sensitivity of labour demand. Hence, wages and employment can both increase even as the optimal collective bargaining mark-up falls (Nicoletti et al, 2001; Andersen and Skansen, 2007). To the extent that labour market rigidities prevent countries from reaping the fruits of economic integration, their effects on employment and productivity should be all the more negative as technical progress and policy reforms dismantle barriers to international trade and factor mobility. But a higher elasticity of labour demand also implies more volatility of employment and wages in response to product market shocks (Scheve and Slaughter, 2004). This increases the appeal of policies meant to buffer the welfare implications of uninsurable risk. International economic integration, however, allows market participants not only to pursue efficiency more freely, but also to circumvent collective regulation. As economic integration makes it difficult or impossible to enforce policies meant to shape individual choices differently from what would be implied by imperfect market mechanisms, it increases the desirability of labour market regulation (as long as markets remain imperfect) at the same time as it decreases its efficacy.

In practice, the balance of these forces may associate economic integration with more or less pervasive institutional interference with labour market mechanisms (Agell, 2002). There is evidence in the literature on the tension between more general government policies and internationalization of economic relationships. While the risks entailed by international trade and specialization may lead more open countries to engage in more pervasive interference with market-driven income distribution processes,

increasing openness may make such interference moot. Rodrik (1998) documents a positive association between government size and openness in a short panel of countries; but in a longer panel, in specifications with country fixed effects, Bertola and Lo Prete (2008) find that increasing openness is significantly associated with smaller government size and lower social expenditure, and more strongly so in countries with better developed financial markets. This is consistent with the notion that international competition increases the relevance of cost competitiveness and challenges governments' power to regulate markets (Sinn, 2003; Bertola, 2007a), and a stronger tendency for globalization to erode government policies is not surprising in countries where financial markets are make it less necessary to rely on government redistribution in order to smooth consumption. Bertola and Lo Prete (2008) also report similar (if weaker) evidence of a negative association between greater openness and labour market regulation.

### **2.3. Economic integration, macroeconomics, and policy implications**

If economic integration increases the responsiveness of market interactions and heighten the negative implications of interference with laissez faire labour markets, one might expect less pervasive and less distortive policies to be chosen by policymakers (Bertola and Boeri, 2002). But smooth adjustment to changing structural conditions requires a suitable bargaining environment. Centralized wage bargaining can be beneficial when it is "coordinated" (Calmfors and Driffill, 1988), i.e. when it properly takes into account the country-level employment implications of wage demands. Collective bargaining at intermediate levels of centralization, such as sectors or occupations, can instead generate excessive unemployment, even from the union's own point of view, if it leads to uncoordinated wage demands to leap-frog each other in an attempt to grab purchasing power from other sectors. Stronger product market competition (and, in tradable sectors, international competition) tend to reduce such excessive unemployment tendencies, because wage moderation will be enforced by loss of market share and employment in favour of foreigners (Danthine and Hunt, 1994). But unions, whether nationwide or not, may fail to internalize this mechanism: if bad labour relations imply that wage demands are slow to learn that the changing structure of economic interactions imposes a stronger penalty on high labour costs, then international economic integration and product market deregulation may increase unemployment (Blanchard and Philippon, 2004). Slow adaptation is all the more likely and dangerous if wages and labour costs are shaped by institutional constraints, such as legal minimum wages and tax wedges, that should but need not be reformed when international economic integration increases the elasticity of employment to cost conditions.

There are other interactions between labour market institutions and internationalization of economic activities. Encompassing unions, such as those traditional in Scandinavian countries, can assess the



implications of unemployment insurance and other labour market policies from the perspective of the country as a whole: in particular, a transparent link between contributions and benefits at the level of the government's budget reduces wage-setters' inclination to demand high take-home pay (Summers, Gruber, and Vergara, 1993), and puts them in a better a position to understand that allowing wage differentiation can serve collective goals when globalization increases the returns of reallocation of labour towards more productive occupations and sectors (Andersen et al., 2008).

And internationalization of economic relationships also has implications for the conduct of monetary policy. To the extent that international competition flattens the Phillips curve relationship between economic activity and wages or prices, globalization reduces time-inconsistent temptations to produce inflationary surprises.<sup>1</sup> Since monetary policy is conducted by the European Central Bank for all member countries of EMU, however, any change in monetary policy's economic impact should be attributed to the new monetary policy environment rather than to tighter economic integration across the member countries.

#### **2.4. Labour markets in a monetary union**

Broader and stronger markets shape the effects labour market policies in any economic integration experience. That mechanism is operative in EMU because a single money strengthens the single market's implications for the competitiveness of markets. The absence of currency risk reduces the extent to which price and wage stickiness may blur relative productivity signals, and assigns a more important role to competitiveness in broader and integrated markets for goods, services, and financial products. Deeper integration fosters efficiency not only by letting market participants make wider-ranging and better informed production and consumption choices, but also by exerting pressure towards efficiency-enhancing reforms, which may also be spurred by the absence of devaluation and other macroeconomic escape routes towards at least temporarily better competitiveness (Belke, Herz, and Vogel, 2007, review the relevant theoretical channels and evidence).

The European countries that joined EMU are characterized by particularly pervasive and possibly inefficient regulation of labour markets, and EMU's peculiarly strong form of economic integration also fosters political incentives to improve labour market flexibility: since member countries renounce all independence in monetary and trade policy, and much independence in other policies, political processes that might otherwise preserve the institutional status quo of labour markets can be forced into reform. As "there is no

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<sup>1</sup> See Rogoff (2006) for an extensive discussion. Sbordone (2007) assesses whether a more competitive economic structure, modelled in terms of market-size-dependent mark-up as in Melitz and Ottaviano (2008), can imply a flatter inflation/output relationship in response to monetary and other shocks. In practice the effect is small, because the lower mark-ups implied by more intense international trade are also variable and more sensitive to economic conditions.

alternative" (TINA), EMU countries should deregulate their labor markets (Bertola and Boeri, 2002, and other references in Bertola, 2006).

Monetary union also has specific implications regarding the character of macroeconomic adjustment. As emphasized by Bean (1998), Bentolila and Saint Paul (2001), and other speculative studies of EMU's possible labour market impact before its inception, irrevocable fixing of exchange rates has the obvious implication of preventing individual countries from choosing their own monetary policies and, to the extent that the Growth and Stability pact is a binding constraint, fiscal policies as well. Such labour market features as the structure of collective wage contracting also have macroeconomic implications. If nominal prices and wages are rigid, for example, the absence of currency devaluation options may require sharper activity slowdowns and unemployment increases when competitiveness needs to be restored in the aftermath of negative shocks.

On the other side of the coin, ruling out devaluation options may enforce wage moderation at any given level of unemployment. Before EMU inception, this channel of interaction between labour market and policy attracted much attention. While under poor monetary policy credibility wage negotiations would routinely discount devaluation and imply real wage rigidity, national coordination of wage demands played a key role in allowing Italy and other weak-currency, inflation-prone countries to avoid currency crises, control wage-price spirals, satisfy the Maastricht criteria, and join EMU. Calmfors (2001) pointed out that nominal wage flexibility should remain important in the absence of exchange rate flexibility, and argued that EMU could continue to foster national coordination of wage demands (and perhaps even transnational coordination of wage bargaining). The macroeconomic pros and cons of centralization and their interaction with monetary policy regimes are not simple, and may change once a country has entered EMU. Before the fact, the threat of a crisis in weak-currency countries could muster a measure of social partner solidarity, and wage moderation. Once in EMU, wage-setting may only be restrained by product market competition. Unions, especially those representing workers in the public or other non-tradable sectors, may therefore coordinate poorly and increase wages at the expense of employment opportunities and, ultimately, of the country's competitiveness.

It is important, however, to take into account that the relevant politico-economic interactions occur at different levels of decision-making power, and that other relevant aspects are also affected by economic integration. From the macroeconomic point of view, defusing crises can actually foster a "there is no need" rather than a TINA attitude in political-economic interactions. And while aggregate wage and employment flexibility is certainly important in the absence of exchange rate changes, relative wage and employment flexibility is perhaps even more important across the regions, sectors, and occupations of countries where

market integration reduces the relevance of country-level shocks and increases that of specific shocks. Thus, centralized and unavoidably homogeneous wage setting in large countries (let alone Eurozone-wide wage bargaining) is less likely to be viable in EMU than outside EMU.

More generally, it is doubtful that National macroeconomic policy and labour market reactions would be able to support favourable income dynamics within an integrated economic area. Activity is still less regionally specialized in Europe than in a fully integrated economy like that of the United States. As economic integration proceeds, however, regions and sectors will typically span national borders. This blunts national monetary and fiscal policies as stabilization tools: when most labour market shocks occur at the regional or industry level, the fiscal policy independence suppressed by EMU would likely be a source rather than a remedy for national economic fluctuations (Darvas, Szapáry, and Rose, 2005). Market adjustment mechanisms, conversely, become more important if a single currency enforces price transparency and promotes macroeconomic stability (in conjunction with Stability and Growth Pact constraints on fiscal policy). In an environment of macroeconomic stability, market adjustment mechanisms are very important, because correction of disequilibria cannot be left to devaluation and fiscal escape routes. Relative prices, wages, employment, and production levels should respond more promptly to exogenous shocks, even in the absence of institutional reforms, as it becomes more important for economic agents to exploit margins of adjustment.<sup>2</sup> And as macroeconomic stability and tight market integration calls for wage and employment flexibility in response to sector- and regions-level shocks, the coordinated wage bargains that proved useful in order to cope with country-specific adjustments to shocks may hinder the necessary adjustments, as centralization tends to compress wages.

As other adjustment channels are shut down in a single-currency area, flexibility of labour markets may be a priority from the EMU-wide point of view. But labour market policy making remains essentially national, so actual reform patterns are influenced by coordination problems. And many financial and services markets, as well as labour markets themselves, remain segmented and imperfect within each country. Hence, politico-economic interactions at the National level also influence the resilience of status quo policy configurations (Bertola 2006, 2007a). It may well be relatively easy for smaller and more homogeneous countries to reap the rewards of enhanced labour market flexibility, while deregulation can be politically difficult and economically inefficient in countries where labour market rigidity addresses more serious redistributive issues, or where underdeveloped financial markets make it important for households to rely on stable jobs and wages in order to smooth consumption patterns. If not accompanied by development of market-based risk-management frameworks, openness to international competition may in fact increase

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<sup>2</sup> See Bertola and Boeri (2002), and Nicoletti et al. (2001) for empirical evidence from the quasi-monetary union of the so-called D-Mark area in the 1980s and 1990s.

the desirability of labour market and social policies meant to reduce the welfare impact of new sources of sharper labour market shocks. And the increasingly negative efficiency impact of such policies in economically integrated countries may, in the absence of appropriate policy reforms and market developments, challenge the political sustainability of economic integration itself.

### **3. What has changed**

Aiming to assess the relevance and relative strength of the theoretical mechanisms reviewed above, this section examines empirical associations between EMU, labour market policies, and labour market outcomes. The theoretical possibilities reviewed in Section 2 can be empirically relevant along two related dimensions of the data. Theory predicts that the undesirable side effects of labour market rigidities are more pronounced in the more tightly integrated member countries of EMU and that – depending on the character of policy-making processes – this may or may not be conducive to labour market reform. Thus, it is interesting to try and see whether in those countries flexibility-oriented reforms were in practice sharper, and/or labour market institutions had more negative outcome implications.

The relevant evidence is not abundant, and not easy to disentangle along these two dimensions. The literature so far has looked for evidence of the first implication, on the basis of the TINA argument, and has not detected significant evidence of an association of EMU with faster or more intense reforms (see Duval and Elmeskov, 2006; European commission, 2007a; and the discussion below of these and other contributions' approach and results).

In this paper, empirical exercises are purposely kept simple, and aim at offering suggestive and illustrative evidence of interesting theoretical effects' practical relevance. While unavoidably limited by data scarcity and joint-endogeneity concerns, statistical assessment of empirical patterns certainly helps sharpen theoretical arguments, and can offer useful policy insights.

#### **3.1 Data**

The available data of course can offer only limited information, for two reasons. First, that EMU is a recent and unprecedented experiment. Second, that macroeconomic indicators are unavoidably imperfect indicators of a more complex and nuanced reality. But neither more abundant, nor better information is currently available, and the policy relevance of the phenomena under study is too strong for research to wait until more precise evidence will perhaps be available.

Empirical investigation of available data can be usefully disciplined by a narrow focus on the experience of eurozone and other countries in the period surrounding EMU inception. What follows analyzes the

relationship of EMU to the interaction of institutional change and labour market outcomes in data from two standard sources. Relevant outcome indicators are available from Eurostat for all EU countries, as well as, in some cases, for EEA countries, accession candidates, the US, and Japan. The Bassanini and Duval (2006) data set, available for years up to 2003 only, collects similar outcome indicators for major OECD countries. The sample includes the EU15 countries (except Greece) as well as other major OECD countries (Australia, Canada, Japan, New Zealand, Norway, Switzerland, and the United States).

The Bassanini-Duval data set also includes a number of institutional indicators. For purpose of detecting reform tensions and policy patterns, the yearly indicators of “de facto” configurations drawn from the Bassanini-Duval dataset have advantages and disadvantages vis a vis legislation-based information, such that made available for research by the DeBenedetti Foundation and the European Commission. It has proven somewhat difficult to detect a sharp overall tendency in analysis of count data drawn from those reform sets (European commission, 2007a), possibly because a degree of arbitrariness is unavoidable when summarizing complex laws in a simple index: consistently with this, it has been possible to detect some interesting results concerning the configuration effects of reforms targeted to groups with low participation rates (European Commission, 2008a). Indicators based on observation of current institutional features are easier to interpret, though they may be driven by endogenous responses of economic phenomena and legal practices. Duval and Elmeskov (2006) define discrete “reforms” according to whether observed changes of OECD institutional indicators are unusually large, in a country and year, relative to the sample. This approach did not detect find any evidence of more frequent such reform events in EMU.

Here, the focus will be on comparisons across EMU and non-EMU groups of countries and over time of a small number of policy and outcome indicators. The sample is restricted to 1995-2005. Labour tax rates and social expenditure indicators are available only up to 2005 (a recent redefinition of these and other databases makes it very difficult to compare later and future data to those published before 2000). Other institutional indicators are available only up to 2003 in the Bassanini and Duval (2006) OECD database. Some indicators, such as UI replacement rates, are available in raw form for later years. Longer samples, when available, yield very similar results in regressions such as those reported below. The 2008 update of the OECD EPL indicator will make it possible to characterize more fully and reliably EMU policy patterns.

The analysis focuses narrowly on the relationship between employment and the policies that may lead it to move along any given labour demand schedule (as in Figures 1 and 2). Several potentially interesting aspects cannot be analyzed empirically for lack of information. Collective bargaining has an important role in theory, but the most important institutional characteristic (coverage of the labour force by contracts) is difficult to measure objectively at suitably short frequencies and for recent periods. The sources and extent

of wage rigidities are similarly difficult to assess on short time series.<sup>3</sup> Aggregate evidence on unit labour cost convergence is not clear cut: it is hard to tell whether it is driven by productivity or wage dynamics, i.e. whether employment and wages dynamics reflect shifts of the labour demand curve or movements along it.<sup>4</sup> And while it would be interesting to see whether traded and non-traded sectors EMU and other economies experience different wage and competitiveness dynamics, it is very hard to do so in practice, both because the definition and measurement of the relevant concepts is too debatable for comparable information to be easily compiled, and because Balassa-Samuelson effects on the relative price of non-traded goods in countries at different levels of development can easily blur the information content of time-series data across the relevant groups of countries and different labour force groups.

It is important to keep in mind, however, that employment opportunities for secondary worker groups may be more plentiful in nontradables and services as well as more severely affected by labour market rigidities. Thus, empirical patterns may be driven by shifts across tradable and nontradable sectors (arguably, albeit increasingly loosely, linked to services and manufacturing productions) as much as by reforms triggered by international competitiveness concerns. The empirical strategy discussed and implemented below will be able to focus on the latter mechanism if the former type of structural change is not more important in EMU member countries. It has to be recognized, however, that reforms enhancing employment opportunities for secondary labour force segments may also have been triggered by fiscal constraints, and that EMU may have made those constraints more binding by limiting deficit spending as much as by weakening taxation powers via international competition pressure.

### **3.2 Empirical strategy**

To assess the extent to which differences and developments are accounted for by policy configurations and reforms, it is possible to focus on EMU interactions the methods and insights of existing empirical work on the relationship between labour market institutions and un/employment (Bassanini and Duval, 2006, and its references) and with labour income and overall inequality (Koeniger, Leonardi, and Nunziata, 2007; Checchi and Garcia Penalosa, 2008).

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<sup>3</sup> European Commission (2007b) contains an extensive discussion of recent developments. Arpaia and Pichelman (2007) uncover a number of interesting, but difficult-to-interpret differences in wage adjustment mechanisms across European countries.

<sup>4</sup> European Commission (2007c), Chapter 3 examines the evidence regarding the trade-off between productivity and employment implied by movements along labour demand curves, finding that such a relationship explains only a portion of observed labour productivity, and that it is unstable and disturbed by total factor productivity changes.

Of course, each country has its own problems, different shocks, and different political resistance to reform. But many shocks, such as those originating in global development and integration patterns, or in international financial markets, are common to all European countries. A comparison of labour market policies and performances across EU15 countries and over the period of EMU inception can, to the extent possible, isolate the implications of what some of them have in common, and others do not: membership in EMU. Such an approach has been applied by Bertola (2008) to inequality indicators and social policy expenditure, finding that EMU membership is associated with somewhat higher inequality, and that the empirical patterns of inequality changes are largely explained by those of public social expenditure as a share of GDP. That paper also detects an association of EMU with significantly stronger trade, services, and FDI integration, as well as with higher per capita GDP. Crucially from the present paper's point of view, there is also significant evidence of a negative association between EMU and unemployment, which in turn appears to be negatively associated with household income inequality.

Since the amount of information about EMU is limited by its recent, local, and unprecedented character, only tightly focused specifications can hope to detect empirical patterns. In the regressions reported and discussed below, a dummy variable captures changes associated with Emu membership. This dummy, denoted EMU in the tables, is equal to unity in 1999 and later years for Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands, Portugal, and in 2001 and later years for Greece. It is meant to capture variation associated, for a given country and in comparison to countries that remain out, with adoption of the common currency. A similar summary statistic is the slope of a trend computed across the adoption date which, when allowed to differ across countries that do or do not enter EMU, can also detect more or less gradual changes in the variables of interest.

Simple differences across these estimates, however, cannot disentangle the effects of EMU from those of other synchronous developments. Since most of the countries in the sample ended up adopting the euro during the period considered, regression specifications need to differentiate the association with EMU from that with the time of observation, and that with permanent characteristics of the countries considered (other than those associated with their inclination to join EMU). To control for common developments, it is possible to include year effects. To control for country characteristics, fixed effects specifications allow estimation of country-specific intercept.

The size and character of the comparison group is of course not such as to foster complete confidence in the results: Denmark, Sweden, and the UK when the sample is restricted to the EU15; other industrialized countries when comparable data are available. The results, however, are reassuringly robust across a variety of specifications. The timing of the EMU switch can be altered without changing the message of the

regressions, and a very similar message is conveyed by specifications where countries that did and did not adopt the euro are allowed to have different trends: the magnitude and significance of the coefficient of an EMU-specific trend component is always very similar to that of the dummy coefficient, and either may pick up a structural effect of EMU developing slowly over time through anticipation and lagged reactions.

When interpreting the evidence it is important to keep in mind that countries that adopted the euro certainly differ from the others in many relevant respects. They were not forced by an experimenter to join EMU. They chose to do so, and their decision was presumably influenced by their own characteristics as well as by the relationships between observable variables detected in the data. Finding that in EMU member countries' labour markets regulation and unemployment decreased, or inequality increased, does not imply that those effects would be observed in any country were it to join the Eurozone. The observed pattern of institutional and outcome dynamics can be a natural consequence of the fact that many of the first wave of Eurozone countries had the most room for unemployment reduction and flexibility-oriented reforms. There is no way of knowing for sure whether countries that joined EMU would have followed a similar path if they had not. In this sense, the evidence can only be descriptive. Analysis of the data, however, can test the practical relevance of the theoretical insight, discussed above, that the desirability and effects of labour market policies are affected by tighter economic integration. The data can neither confirm nor deny that countries in the sample that did not but could join (Denmark, the UK, and Sweden) did not want or need to reform, or that countries that did join EMU may have done so also in order to obtain suitable reform incentives. But they can tell us whether the intensity and the (good or bad) effects of country-level policy interference with labour market outcomes are correlated with EMU membership and, to the extent that the effects of labour market institutions are (or are perceived to be) desirable, empirical evidence can detect the extent to which membership in a monetary union requires different policy approaches.

### **3.3 Evidence**

The results are similar in various specifications of the relationships of interest. For brevity and simplicity of interpretation, Sections 3.3.1 and 3.3.2 mostly focus on regressions estimates from the EU15 sample specification that include EMU dummies (capturing the association between the left-hand side variable's realization and Eurozone membership), along with year dummies and country-specific fixed effects. The Tables also report estimates on the broader OECD sample (and shorter time period, stopping in 2003) and from specifications detect gradual changes by allowing for separate trends across the samples of countries that do or do not adopt the single currency around 2000; these are discussed only when they deliver



different messages. In Section 3.3.3, more complex multivariate specifications aim at detecting plausible structural mechanisms.

### **3.3.1 Unemployment and employment outcomes**

Consider first the evidence regarding employment and unemployment. In theory, the effects of integration on these indicators depends on whether policies are reformed in light of their effects, or reform inertia leads unchanged institutions to have more negative side effects. In practice, as we shall see, the available data strongly suggest that EMU was associated with higher employment and lower unemployment, especially in the “secondary” labour force segments where labour market policies are expected to have stronger disemployment effects (Bertola, Blau, Kahn, 2007) and where EMU member countries may have concentrated their reform efforts (possibly because of the political strength of primary workers or “insiders,” and with the consequence of increasing the “dualism” of labour markets’ institutional structure).

Figure 3 displays aggregate and youth unemployment rates in terms of deviations from country means, separately for the EMU and non-EMU observations. There is a clear tendency for unemployment to be lower when the EMU dummy equals one, but it is also clearly apparent that this may be driven by cyclical developments. Figure 4 conveys a similar impression regarding employment rates, which tend to be higher in the EMU subsample.

The regression evidence in Table 1A-1E confirms this impression and makes it possible to sharpen its interpretation. Table 1A reports that labour market outcome indicators are very significantly different across the EMU and non-EMU portions of the sample (in these and all other tables, t statistics are robust and account for clustering at country level), and also detects a significant difference in GDP per capita (driven by higher employment, rather than by labour productivity, which is not significantly different). Of course, however, unemployment and employment rates are affected by many other factors. The presence in the sample of countries that did not adopt the euro (and were not ‘treated’ by EMU) makes it possible to try and detect associations between EMU and labour market outcomes. But since some countries could be less inclined to regulate their labour markets regardless of whether they adopt the single currency at some point during the sample period, and a large proportion of the countries observed end up belonging to EMU during the sample period, the regression could mistakenly attribute to EMU the broad trends common to all countries. And since the dummy can only capture EMU’s timing, its coefficient can be influenced by the global cycle, by EU enlargement, and by any other event occurring at roughly the same time.

Regressions that control for country and year effects (reported in Table 1A and 1B for two different samples of countries and different indicators) address these issues. Country dummies can control for

relevant permanent characteristics, and if regressions include year effects the coefficient of an EMU dummy picks up the average difference (between countries that do and do not use the single currency) of year-specific means of the left-hand side variable, which could be influenced by contemporaneous developments only to the extent that they affect Eurozone countries differently from others.

This specification yields fairly strong evidence of lower unemployment (especially in the more sensitive youth segment of the labour force) and higher employment (again, more strongly so in “secondary” labour force segments, such as the female one) in EMU. There is also evidence of lower long-term unemployment, and no evidence of changes in per capita or per-hour production, suggesting that a movement along the labour demand curve was accompanied by an upward shift of labour productivity relative to the control group. The message of specifications modelling EMU effects in trend terms is qualitatively, quantitatively, and statistically similar in Tables 1D and 1E. Thus, at least part of the raw change in labour market outcomes for the sample of countries that did join EMU, shown in Figures 3 and 4 and in Table 1A, appears to be associated with EMU itself, rather than with the identity of the countries or with the influences of common (to the industrialized countries in the sample) factors captured by year effects.

### **3.3.2 Policies**

From the theoretical perspective outlined in Section 2, unchanged policies should have implied worse disemployment in more tightly integrated countries. Thus, the tendency detected above for EMU to be associated with higher employment and lower unemployment leads us to expect that it should also be associated with less rigidity in labour market policies. Figures 5 and 6 display available data over the sample of interest for some important policy variables: Employment Protection Legislation indicators, for regular and nonstandard contracts, and average and marginal labour tax rates.<sup>5</sup> These are highly heterogeneous across EU15 countries, and much of the policies’ heterogeneity of course depends on country-specific characteristics. To highlight the changes associated with EMU membership, the plot shows deviations from country-specific means, separately for the EMU and non-EMU country-year observations.

Both tax rates and EPL appear to decline in EMU. It is also apparent that the dynamics of policy variables are very different across countries. To isolate the EMU-specific component of policy changes and assess their significance, Tables 2A-E display coefficients of EMU-specific dummies and trends in a variety of regression specifications for these and other policy indicators, along with robust t-statistics testing whether they are different from zero.

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<sup>5</sup> Both average and marginal taxes are theoretically relevant to labour market participation and labour supply choices. See Pissarides (1998) for a discussion of their effects on unemployment.

The preferred specification of Table 2C offers some evidence of an association between EMU and changes in labour market regulation. Relaxation of nonstandard contract EPL provisions is almost significant, and there is a significant increase in the generosity of unemployment insurance systems as measured by average replacement rates (which increased in EMU countries such as Ireland and Italy, and decreased in control countries such as Sweden and Denmark). The decline in the two measures considered of labour taxation is sizeable, but statistically insignificant. However, it is easy to find stronger evidence of regulation with regressions specifications meant to investigate a little deeper the determinants of policy choices. In Table 2F, controlling for government deficits (Maastricht definition) increases the size and significance of the average labour tax reduction in EMU vis-à-vis the non-EMU portion of the sample: since year and country dummies are included, the significantly negative impact of EMU on labour taxation becomes evident when the relative need to improve government finances is accounted for.

The other specifications aimed at detecting associations between EMU and labour market policy similarly offer intriguing and often significant evidence of laxer EPL, smaller labour taxation, and higher UI replacement rates. This evidence is not as negative as that discussed in European Economic Advisory Group (2008), Duval and Elmeskov (2006), European Commission (2007a). Drastic reform may not have been observed in Eurozone countries, but their labour market institutions, relative to non Eurozone ones, have significantly changed over the period when they completed monetary union. A milder, but significant version of the TINA hypothesis does appear to be at work.

An important exception to the tendency towards labour market deregulation is the statistically significant increase of unemployment insurance average replacement rate. These are of course only one of an unemployment insurance scheme's relevant characteristics: a higher UI replacement rate can be associated with lower unemployment if it is accompanied by more stringent availability-to-work and other eligibility requirements, and can be consistent with the decline in aggregate and long-term unemployment rates documented above. It is however interesting to observe that if any typical pattern can be detected for EMU countries, it is one where UI replacement rates increase as EPL decreases: in Figure 7, we see that the trajectories followed by EMU countries in terms of UI and EPL lie along a trade-off relationship where all of them initially lie except Ireland, that appears to converge towards it (while the UK remains well below that line, and Denmark well at one extreme).

Unemployment insurance and EPL are alternative ways to shift labour market income risk away from workers and their families, towards firms with better access to financial markets (in the case of EPL) or to collective redistribution schemes (in the case of UI). As demands for protection against labour market risk are if anything stronger in more open economies, and need not be addressed by private financial market

development, an alternative does need to be found to pure deregulation. The data indicate that UI tends to substitute EPL in more tightly internationally integrated countries, and this can be sensibly interpreted in terms of the two schemes' different implications for competitiveness: when product markets are more competitive and capital can move across borders, it is harder for policy to burden firms with efficiency losses, and collectively administered unemployment insurance schemes may be better ways of addressing workers' protection demands.

### **3.3.3 Outcomes, policies, and economic integration**

Does economic integration really have the implications discussed in Section 2? In theory, the employment impact of labour market rigidities should be stronger in more open and more competitive economies (and this is the reason why, in the TINA view, deregulation should and to some extent is observed in EMU). To assess the empirical relevance of these insights, one might include economic integration indicators in standard labour-market-oriented empirical work, such as the regressions run by Bassanini and Duval (2006). European Economic Advisory Group (2007) did not uncover significant evidence of a role for such interactions: in their regressions, openness appears to be associated with better labour market performance, but the impact of various institutions is not significantly affected by openness. The main effect of openness may or may not warrant structural interpretation, but can certainly be consistent with a positive impact of product market competition and higher efficiency on labour demand at given wages, on labour supply through the higher purchasing power of product wages, and on wage moderation. The theoretically sound interaction effects is, not surprisingly, difficult to detect in a specification that, after extensive investigation of the limited information present in a small data set, leaves little to be explained.<sup>6</sup>

The next set of tables implement a simpler approach, trying again to make the best use of the limited information available, and focusing on the most important interaction regressions. The regressions of Table 3A-3C test whether EMU is associated with stronger market integration. We see in Table 3A that goods trade and foreign direct investment flows have become more intense after EMU in participating countries, and that services openness has also increased (more weakly, and unsurprisingly so in light of the overall underdeveloped harmonization of that market's regulation). Tables 3B and 3C, however, show that only for

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<sup>6</sup> Bassanini and Duval also find only weak and mixed evidence of interactions between various dimensions of labour market regulation. A large and influential body of work argues that comprehensive policy reforms have larger effects than piecemeal ones. Of course, however, labour market institutions reinforce each other's effects along both the undesirable (lower employment) and desirable (higher and more stable labour incomes) dimensions: thus, policy complementarities need to be taken into account when considering how structural change affects the desirability of reforms, but need not imply that comprehensive reforms are "better" than piecemeal ones.

goods there is some evidence of an EMU-related increase in openness when time effects are included in the regressions.

Does closer economic integration have the implications illustrated in Figure 2, where labour taxation has sharper negative implications for employment as labour demand becomes more elastic? Figure 8 shows employment rate and tax wedge data. The overall association between the two is ambiguously sloped: some countries, such as Sweden, are able to sustain both high employment and high taxes, while others, such as Greece, lie low along both dimensions. This presumably reflects specific characteristics of each country's economic and social structure, such as the more or less "encompassing" character of their policymaking and wage bargaining processes. But the figure also shows that many countries experienced large shifts in both of these variables over the sample period, and that typical country-specific trajectories are negatively sloped (in the direction of lower taxes and higher employment).

To see whether the data support the association of tighter integration with more negative effects of labour market regulation, it is possible to run regressions of employment rates on labour taxation and its interaction with economic integration. Controlling for country and year fixed effects, the first two columns of Table 4A estimate a very significant coefficient of the two available tax measures as explanatory variables of aggregate employment rates in the EU15 sample. The OECD sample interactions, not reported, are very similar, and the effects are even stronger for female employment rates: this is consistent with the arguments of Bertola, Blau, and Kahn (2007), but of course female employment may be more strongly affected by cultural differences and trends that have little to do with economic integration.

Among the forces driving tax and employment outcomes along tradeoffs such as that illustrated in Figure 1, some – such as increasing openness to Far East trade and technological changes – are common across the entire sample. But others may be specific to EMU members and years. The third and fifth columns of Table 4A include the EMU dummy and its interaction with labour tax rates among the explanatory variables, thus allowing the relationship between taxes and employment to differ across the EMU and non-EMU subsamples. Again controlling for country and year fixed effects, the regressions detect a negative and strongly significant interaction. As shown by the fourth and sixth columns of Table 4A, there is also a negative and significant interaction between labour taxes and trade openness, shown above to be positively related to EMU membership.

While the limited amount of information available in the data prevents reliable testing and measurement of plausible theoretical mechanisms, the observed patterns of coefficient can help focus attention on mechanisms that are theoretically obvious in terms of their direction and relationships, but may be realized with different intensity in EMU experience. The evidence is consistent with the mechanisms outlined in

Section 2: monetary union fosters market development, and strengthens the negative association between labour tax rates and employment. The main and interaction coefficients in the regressions predict that each percentage point of marginal labour tax rates is associated with  $\beta_{NOT}=0.07$  fewer points in the non-EMU sample and (adding the estimated interaction effect)  $\beta_{EMU}=0.19$  fewer points of employment in the EMU sample; in average tax terms,  $\beta_{NOT}=0.27$  and  $\beta_{EMU}=0.36$ .

The difference of predicted employment rates (in deviations from country means) can be decomposed as

$$\begin{aligned} Emp_{EMU} - Emp_{NOT} &= \alpha_{EMU} - \beta_{EMU} Tax_{EMU} - (\alpha_{NOT} - \beta_{NOT} Tax_{NOT}) \\ &= \alpha_{EMU} - \alpha_{NOT} - (\beta_{EMU} - \beta_{NOT}) Tax_{EMU} - \beta_{NOT} (Tax_{EMU} - Tax_{NOT}) \end{aligned}$$

In the data, average deviations from country means differ across the EMU (64 yearly observations) and non-EMU (76) yearly observations) subsamples of EU15 observations by 2.4 percentage points for employment rates, and the  $(Tax_{EMU} - Tax_{NOT})$  difference is -1.1 percentage points for marginal tax rates, -1.6 percentage points for average tax rates. If the slope of the relationship between employment and taxes had remained as steep in EMU as it was outside of it, the change in tax rates would imply a  $\beta_{NOT}(Tax_{EMU} - Tax_{NOT})=0.07$  percentage point change in employment rates when marginal measures are used in the regressions, 0.54 when average tax rate are used. Thus, tax reductions associated with EMU have a statistically significant but economically modest role in explaining employment rates: reforms have not been as dramatic as TINA views might have predicted.

But the change in slope illustrated in Figure 2 above can be detected in the data, and does have negative implications for employment. The mean average labour tax rate is about 0.43 in EMU observations, and the mean marginal tax rate is about 0.52; taking the regression estimates at face value, the change in slope would imply lower employment, by  $(\beta_{EMU} - \beta_{NOT})Tax_{EMU}$ , of between 4 and 7 percentage points. In the regression results, this is more than offset this effect by a large estimate of EMU's main effect on employment rates (between 7 and 10 percent). This may reflect the higher productivity and relative wage moderation effects of economic integration but, of course, could also be generated by spurious associations between EMU membership and, for example, female labour supply developments.

The evidence is similar, albeit weaker, as regards other policies and outcomes. For example, Table 4B reports regressions of long-term unemployment rates on a very plausible policy determinant, the indicator of Employment Protection legislation for temporary contracts. The first column of the Table indeed detects a significantly positive impact of EPL on long-term unemployment when only country effects are included in the regressions, but the third column shows that the association is negative when time effects are added to

the regression. The interaction terms in the second and fourth column of the Table assess whether the impact of policy on outcomes differs in EMU. As shown in Section 3.3.1, long-term unemployment is lower in EMU, and Section 3.3.2 reported evidence that this dimension of EPL significantly less stringent in EMU. The interaction of EPL and EMU is positive, consistently with the notion that more powerful market forces strengthen the negative side effects of labour market policies, but is not very significant, also because the sample size is further limited by data availability.

#### **4. What else may need to change?**

The previous sections provide significant evidence that EMU was associated with less unemployment, more employment, less taxation of labour, and sharper negative effects of taxes. This is consistent with TINA views: as market competition becomes more intense, it worsens the trade-off between income smoothing or redistribution on the one hand, and employment losses on the other hand. Policymakers appear to be sufficiently sensitive to the latter effect to implement flexibility-oriented reforms, and increase employment. Labour market policies, however, are not primarily meant to reduce employment and increase unemployment. As discussed in Section 2, these are unavoidable side effects of policies meant to improve workers' welfare. Thus, as the tradeoffs between their benefits and costs worsens, a price may have to be paid for more favourable employment outcomes in terms of higher risk and less even income distribution.

There is much less, and less reliable, information about inequality than about employment and unemployment rates. No recent earnings inequality information is available from the OECD "Earnings trends" database, and different definitions would anyway make those data difficult to use for cross-country comparative (rather than trend assessment) purposes. The association between disposable household income inequality and EMU is analyzed in Bertola (2008) on the basis of Eurostat quintile ratio statistics. The quality of those indicators is not very high, because of recent changes in definitions and measurement. But in a regression specification that explains inequality by per capita GDP and population, the EMU dummy is positive and significant. Of course integration, while making markets more efficient and powerful and increasing average production, does not benefit everybody equally. But the estimated effects of integration on inequality need not be a reflection of direct effects, because income gains and losses from international trade and factor mobility are not related to income levels in simple ways: if before integration market power or scarcity benefits relatively rich producers, removal of international barriers to trade and factor mobility reduces inequality. As remarked above, however, international competition also reduces National governments' powers to tax and target benefits. In fact, Bertola (2008) finds that controlling for social policy expenditure (a very strong determinant, alongside per capita GDP, of disposable income

inequality) the EMU dummy is not significant. This is an indication that economic integration has no strong effect on inequality, but may increase after tax inequality indirectly through policies. To the extent that redistribution reduces production efficiency, this is another reason why removal of international barriers should increase aggregate welfare. To the extent that financial and other markets are imperfect, however, redistribution can be beneficial, and its retrenchment has negative as well as positive welfare implications.

The analysis of Bertola (2008) focuses on public social expenditure as an indicator of government policy that is empirically very relevant to inequality, but not as directly relevant to the present paper's focus on labour market phenomena. In the data set analyzed here, larger social expenditure is empirically associated with higher employment rates, and very significantly so if the specification controls for the negative association of employment with labour tax rates. This may reflect the correlation of social public expenditure with public employment which, as discussed in detail by Algan, Cahuc, and Zylbelberg (2002), also influences unemployment, in theory and in the data, depending on the public sector's fields of activity and wage-setting criteria. The different configuration of social and labour market policy "models" within and between the EMU and other country groups would in principle deserve careful analysis, as different policy interventions may be more or less strongly affected by international competition among systems. While the scarce data available make it empirically impossible to detect separate roles for regulation, taxes and subsidies, and public employment, it is important to recognize that policy channels of interaction between economic integration and inequality or risk can also play out in labour markets, where economic integration can foster production efficiency both directly and by making it more difficult for policy to interfere with markets so as to achieve beneficial effects.

The regressions reported in Table 5 explore the empirical relevance of trade-offs and interactions between inequality, unemployment, and EMU. In the country panel data for which comparable measures inequality are available from Eurostat (restricted to EU15 countries, disregarding the few observations available for some EEA countries), disposable income quintile ratios are strongly negatively related to per capita income. Inequality has followed a U-shaped path in the 1995-2005 period, beginning to increase strongly just at the time of EMU inception. While inequality is lower in EMU countries in the second half of the sample, it is important to control for simultaneous developments of other relevant variables in those and other ("control") countries. Per capita income is robustly associated with lower inequality, and using it as a control variable detects a significantly positive association between EMU and inequality in the first column of Table 5. This empirical relationship may tell us that integration increases income, and reduces inequality by less than would typically be implied by the overall relationship between these two country-level characteristics.



It is interesting to examine the relationship between inequality and unemployment alongside that between inequality and social policy expenditure analyzed in Bertola (2008). The regression reported in the second column of Table 5 includes both unemployment and social public expenditure as explanatory variables for inequality. Both display a negative and significant association with inequality, and together they deprive the EMU indicator of all economic or statistical significance (in regressions not shown, the sharp decline of wages' share of GDP since EMU inception is instead completely unrelated to household income inequality, for reasons discussed in Bertola, 2008). This identifies declines in unemployment, presumably due to the labour market reforms discussed above, as a common and inequality-relevant characteristic of eurozone countries along with social policy expenditure reduction. In the next two columns, each of these indicators remains significant, with a stable coefficient, as the other is excluded from the regression. While the evidence is weaker than other relationships discussed in the paper, a possible interpretation is that in some Welfare State models public social expenditure is the prominent inequality-reduction tool, while in others regulation (in the form of collectively bargained minimum wages, employment protection, and within-household redistribution) creates unemployment but also reduces inequality.

In Bertola (2008), changes in social policy were found to absorb all of EMU's association with inequality. Here, higher employment and lower unemployment play a similar role. As discussed in Checchi and Garcia Penalosa (2008), unemployment is not a risk when induced by rigidity and subsidized. It is rather permanently associated to individuals' labour market position, and correlated to lower wage inequality and household income equalization. For example, generous unemployment benefits increase the disposable of the unemployed at the same time as they increase their number, and since the unemployed earn less than they would if employed and than other workers earn, higher benefits induce a negative association between income inequality and unemployment. Legal or contractual wage minima, and employment protection for primary breadwinners, also tend to increase their income at the same time as they make it more difficult for other members of their household to find employment.

Lower unemployment (of this intentional type) and higher inequality may be viewed as good news or bad news, depending on whether one views labour market policy as a useful or misguided tool for pursuing goals that markets should in principle but might in practice fail to achieve. Financial market development can indeed fulfil some of the needs addressed by social policy in theory, and a consequence of flexibility-oriented developments in labour market policies field should be a larger volume of financial market transactions: certainly as demand goes up along given supply schedule, with negative welfare implications for families forced expensively to purchase from imperfect private providers of credit and insurance what they used to obtain from collective schemes; perhaps, with less negative implications, as supply conditions

improve, either as a consequence of technical progress or market development, or fostered by appropriate reforms of financial market's institutional structure.

There is little doubt that EMU has led to yield convergence and substantial growth in the volume of financial transactions in the euro area (Jappelli and Pagano, 2008). Financial market integration across the boundaries of countries can decrease the need for employment and wage coordination within each country and ease the impact of labour market shocks at the country level, as savings can buffer some of the consequences of wage and employment fluctuations. To the extent that competition also improves financial market access and decreases transaction costs within each country, households may rely on self insurance and portfolio adjustments rather than on unemployment insurance or employment protection legislation in order to shelter their consumption from labour market shocks. This makes it less necessary for policy to interfere with *laissez faire* outcomes, and can address concerns about lack of such policy instruments at the area-wide level.

As shown in the first three column of Table 6, over the whole panel data set credit is positively associated with income inequality, and negatively associated with unemployment (which again can be viewed as a summary measure of a labour market's degree of institutional rigidity). Thus, the data confirm that credit serves as a substitute for labour market policy as a tool for consumption smoothing in the face of higher labour income inequality or volatility. Financial market development can substitute government policies in some of their risk-management role, and if it accompanied labour market deregulation it would bring Continental European countries closer to the United States and other Anglo-Saxon countries along both dimensions. But the fourth column of Table 6 shows that private credit did increase strongly in member countries after inception of EMU. But the next column shows that all of the increase is accounted for by year fixed effects - i.e., that credit increased just as strongly, on average, in EU15 countries that did not adopt the common currency, and did not experience the other effects analyzed in this paper. Labour market deregulation in the apparent absence of better accessible and more efficient financial markets may significantly affect workers' welfare, justify many European citizens' distrust of 'the euro', and threaten the sustainability of the EMU experiment.

## **5. Conclusion and policy implications**

This paper has illustrated interactions between economic integration and labour market policies and outcomes with a suggestive empirical analysis of evidence from the first ten years of Economic and Monetary Union experience in Europe. It is important to emphasize again that the empirical evidence can only speak to associations, not causal effects. Countries were not forced to join EMU, and presumably

chose to do so in foreseeing effects of EMU that (aside from expectation errors) should be those we observe ex post. Still, EMU can in theory and does in practice improve performance of labour markets, chiefly through an evolution of member countries' labour markets towards increasingly flexible institutional configurations. This path may have negative welfare effects and be politically difficult to sustain if labour market institutions still do (or are perceived to) serve useful purposes in the absence of suitable private financial market instruments for consumption smoothing.

The evidence is of course limited by the small amount of information available, and the association between labour market phenomena and economic integration need not warrant causal interpretation. But it does have important policy implications when interpreted in light of labour market policy's potential benefits and possible failures in practice. To the extent that limited financial market access burdens workers with uninsurable risk, correctly configured labour market policy can improve welfare. And if deeper economic integration enhances labour market risk at the same time as it blunts policies meant to control such risk, it needs to be accompanied by suitably coordinated and coherent development not only of labour market institutional structures, but also of financial markets and of policy instruments meant to reconcile production flexibility with consumption security.

Policies meant to address the welfare implications of income volatility are less necessary when private financial and insurance markets are accessible and efficient.<sup>7</sup> Financial exclusion is increasingly recognized as an important dimension of poverty (European Commission, 2008b) and an essential cause and consequence of persistently low welfare. Structural policies aimed at building informational and regulatory infrastructures for European household financial markets would reduce the problems posed by international opt-out opportunities to mandatory social security schemes. And to the extent that collective organization of insurance against life risks remains useful, it would not be necessary to implement such schemes at the European levels as long as a clear, actuarially fair link exists between contributions and benefits in National or occupational schemes. Just like competition among private insurers, competition among collective systems should be appropriately regulated and monitored, so as to ensure that individual participants are adequately informed. EU-level institutions can therefore play an important role in clarifying to citizens the appropriateness and sustainability of the relevant schemes, not only by enforcing budget rules that ensure coherence over time of public finances, but also by certifying that pension, health, and unemployment insurance schemes are consistent with individual choices.

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<sup>7</sup> Differences across countries in the efficiency of financial markets are both theoretically and empirically relevant to the desirability of redistribution policies. See Bertola and Koeniger (2007) for theory, evidence, and references.

Interactions between markets, policies, and countries are of course much broader than those discussed and empirically analyzed here. The influence of international trade and factor mobility on European labour markets spans beyond the borders of the highly developed EU15 countries, on which this paper focuses, and also beyond the borders of the EU27 countries. The effects of trade between Europe and other countries on the appropriateness and feasibility of labour market regulation at the European supranational level (such as the stringency of recently revised working-time rules) is qualitatively similar to that discussed above. To the extent that uncoordinated policies loosen labour market regulation in an integrated economic area, economic integration is sustainable only if regulation becomes less necessary, for example because financial and other markets improve, or if it is coordinated at the same level as that of market interactions.

Supranational policies have addressed similar issues in other areas. Establishing a Single Market in goods required harmonization of policy instruments, such as safety and quality regulations, and a single capital market and fixed exchange rates led to adoption of a common currency. Just like uncoordinated macroeconomic policies were inconsistent with fixed exchange rate and free capital mobility before adoption of a single currency, market integration and subsidiary decision-making powers coexist uneasily in the labour-market and social protection area. But harmonization is difficult in a the labour market policy field, where heterogeneity within and across countries implies that similar policies have different costs and benefits and that different policies are used to target similar goals, efforts to foster international coordination run the risk of imposing excessively complex or excessively uniform constraints on economic agents. The theories and data reviewed in this paper – and new data, such as those collected and analyzed in the framework of the Eurosystem’s Wage Dynamics Network <sup>8</sup> and the 2008 update of the OECD’s employment protection indicators – may help assess the pros and cons of further reforms.

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<sup>8</sup> [http://www.ecb.int/events/conferences/html/wage\\_dynamics\\_network.en.html](http://www.ecb.int/events/conferences/html/wage_dynamics_network.en.html)

## Data Appendix: definitions and sources

Emp.rate (prime age female) Prime-age (age 25-54) female employment rate (%). Source: Bassanini and Duval (2006).

Emp.rate (prime age male) Prime-age (age 25-54) male employment rate (%). Source: Bassanini and Duval (2006).

Emp.rate(female). Employment rate, 25+ female. Source: Eurostat.

EPL(reg) EPL stringency indicator: regular contracts. Source: Bassanini and Duval (2006).

EPL(tmp) EPL stringency indicator: temporary contracts. Source: Bassanini and Duval (2006).

GDPp.c. GDP per capita at 1995 prices, thousands of euro. Source: Eurostat.

GovtBudg: General government deficit(-) /surplus (+), % GDP ( Maastricht criteria definition).

Inc.ineq. 80<sup>th</sup>/20<sup>th</sup> quantile share ratio, net equivalized household income. Missing values are interpolated. Source: Eurostat.

IneqDef: dummy, equal to zero for country and periods when Eurostat makes available the ECHP-based inequality measure or data are missing, to one for country and periods when the EU-SILK measure is available..

Lab.prod. Labour productivity per hour worked, PPS gdp, EU15=100. Source: Eurostat.

Lab.Tax (avg) Tax on the average production worker: total tax wedge in %, single workers at 100% of average earnings, no child. Source: OECD.

Lab.Tax (marg) Unweighted average of marginal tax wedges for four family tGDPp.c.es. Source: Lo Prete (2008) computations on OECD data.

Long term un. long term unemployment rate, % of total active population. Source: Eurostat.

Openn.(FDI) Foreign Direct Investment flows as % of GDP. Source: Eurostat.

Openn.(goods) Imports+exports of goods as % of GDP. Source: Eurostat.

Openn.(serv.) Imports+Exports of services as % of GDP. Source: Eurostat.

P.social exp.: public social public expenditure (except old age and survivor pensions), ratio to GDP. Source: Eurostat.

Priv.credit Ratio to GDP of consolidated credit to total residents granted by the resident banking sector (monetary financial institutions, or MFIs). Includes MFI loans to residents and MFI holdings of securities issued by residents. Securities comprise shares, other equity and debt securities. Source: Eurostat.

UI rep.rate Average unemployment benefit replacement rate across several worker and family types. Source: Bassanini and Duval (2006).

Unemp.(tot) unemployment rate, age 15 and over. Source: Eurostat.

Unemp.(2554) unemployment rate, ages 25-54. Source: Bassanini and Duval (2006).

Youth Unemp. Unemployment rate, age 15-24 (%). Source: Bassanini and Duval (2006).

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	Unemp.(tot)	Youth unemp.	Long term un.	Emp.rate(tot.)	Emp.rate(female)	GDPp.c.	Lab.prod.
EMU	-2.9106	-6.1716	-1.7772	3.6855	4.9680	3.3949	4.5174
<i>t</i>	-3.70	-4.30	-3.55	4.62	6.84	5.02	1.31
N	121	121	119	121	121	121	121

**TABLE 1A:** Simple mean difference between before and after EMU observations for the sample of countries that did adopt EMU within the 1995-2005 sample period (Austria, Belgium, Germany, Spain, Finland, France, Greece, Ireland, Italy, Netherlands, Portugal).

	Unemp.(2554)	Youth Unemp.	Emp.rate (prime age male)	Emp.rate (prime age female)	GDPp.c.	Lab.prod.
EMU	-1.5295	-3.6367	1.5522	3.3570	-0.0388	-1.2513
<i>t</i>	-1.71	-2.25	1.77	3.21	-0.07	-0.27
N	180	180	180	180	176	187

**TABLE 1B:** Regressions on EMU dummy (equal to unity in 1999-2005 for Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands, Portugal) and year dummies, with country fixed effects. Sample: EU15 (except Greece) and other major OECD countries, 1995-2003.

	Unemp.(tot)	Youth unemp.	Long term un.	Emp.rate(tot.)	Emp.rate(female)	GDPp.c.	Lab.prod.
EMU	-0.8328	-3.1229	-0.6547	1.7308	2.0362	-0.0299	1.9127
<i>t</i>	-0.94	-1.86	-1.22	2.13	1.73	-0.05	0.63
N	154	154	152	154	154	154	154

**TABLE 1C:** Regressions on EMU dummy (equal to unity in 1999-2005 for Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands, Portugal) and year dummies, with country fixed effects. Sample: EU15, 1995-2005.

	Unemp.(2554)	Youth Unemp.	Emp.rate (prime age male)	Emp.rate (prime age female)	GDPp.c.	Lab.prod.
trend*EMU0	-3.0307	-7.1991	2.9907	7.1414	-0.4488	-4.3545
<i>t</i>	-4.21	-5.32	3.92	8.52	-1.04	-1.71
trend	-1.9475	-2.1276	0.4445	4.4641	5.1536	7.9636
<i>t</i>	-3.83	-2.22	0.82	7.53	14.38	3.89
N	180	180	180	180	176	187

**TABLE 1D:** Regressions on a trend (1/10 time unit per year) and on an additional trend only for countries that adopt EMU within the sample period, with country fixed effects. Sample: EU15 (except Greece) and other major OECD countries, 1995-2003.

	Unemp.(tot)	Youth unemp.	Long term un.	Emp.rate(tot.)	Emp.rate(female)	GDPp.c.	Lab.prod.
trend*EMU0	-0.7314	-4.9333	-0.5240	3.2042	4.6216	-0.5319	1.6970
<i>t</i>	-0.68	-2.27	-0.83	3.12	4.53	-0.98	0.64
trend	-3.2273	-2.6939	-1.7303	1.9859	2.9593	5.2367	1.9121
<i>t</i>	-3.37	-1.40	-3.09	2.18	3.27	10.89	0.81
N	154	154	152	154	154	154	154

**TABLE 1E:** Regressions on a trend (1/10 time unit per year), on an additional trend only for countries that adopt EMU within the sample period, with country fixed effects. Sample: EU15, 1995-2005. Robust standard errors account for clustering at country level.

	<b>UI rep.rate</b>	<b>Lab.Tax (marg)</b>	<b>Lab.Tax (avg)</b>	<b>EPL(reg)</b>	<b>EPL(tmp)</b>
EMU	2.8348	-0.5801	-1.4582	-0.0332	-0.4722
<i>t</i>	<i>1.89</i>	<i>-0.49</i>	<i>-1.34</i>	<i>-1.31</i>	<i>-2.09</i>
N	90	110	110	90	90

**TABLE 2A:** Simple mean difference between before and after EMU observations for the sample of countries that did adopt EMU within the 1995-2005 sample period (Austria, Belgium, Germany, Spain, Finland, France, Greece, Ireland, Italy, Netherlands, Portugal).

	<b>UI rep.rate</b>	<b>Lab.Tax (marg)</b>	<b>Lab.Tax (avg)</b>	<b>EPL(reg)</b>	<b>EPL(tmp)</b>
EMU	3.9308	-0.6191	-1.4701	-0.0866	-0.4616
<i>t</i>	<i>1.96</i>	<i>-0.41</i>	<i>-1.32</i>	<i>-2.09</i>	<i>-1.80</i>
N	180	210	209	180	180

**TABLE 2B:** Regressions on EMU dummy (equal to unity in 1999-2005 for Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands, Portugal) and year dummies, with country fixed effects. Sample: EU15 (except Greece) and other major OECD countries, 1995-2003.

	<b>UI rep.rate</b>	<b>Lab.Tax (marg)</b>	<b>Lab.Tax (avg)</b>	<b>EPL(reg)</b>	<b>EPL(tmp)</b>
EMU	7.3658	-2.0822	-0.2589	-0.0776	-0.4098
<i>t</i>	<i>2.51</i>	<i>-0.75</i>	<i>-0.35</i>	<i>-1.55</i>	<i>-1.58</i>
N	117	140	140	117	117

**TABLE 2C:** Regressions on EMU dummy (equal to unity in 1999-2005 for Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands, Portugal) and year dummies, with country fixed effects. Sample: EU15, 1995-2005.

	<b>UI rep.rate</b>	<b>Lab.Tax (marg)</b>	<b>Lab.Tax (avg)</b>	<b>EPL(reg)</b>	<b>EPL(tmp)</b>
trend*EMU0	8.0234	-1.2662	-3.0921	-0.2072	-0.9942
	5.35	-1.04	-3.67	-4.51	-4.70
trend	-2.6987	-1.1693	-0.9138	0.1185	-0.0108
<i>t</i>	<i>-2.54</i>	<i>-1.32</i>	<i>-1.49</i>	<i>3.65</i>	<i>-0.07</i>
N	180	210	209	180	180

**TABLE 2D:** Regressions on a trend (1/10 time unit per year) and on an additional trend only for countries that adopt EMU within the sample period, with country fixed effects. Sample: EU15 (except Greece) and other major OECD countries, 1995-2003.

	<b>UI rep.rate</b>	<b>Lab.Tax (marg)</b>	<b>Lab.Tax (avg)</b>	<b>EPL(reg)</b>	<b>EPL(tmp)</b>
trend*EMU0	14.9192	-3.7568	-0.7034	-0.1813	-0.8689
<i>t</i>	<i>6.27</i>	<i>-2.23</i>	<i>-0.56</i>	<i>-2.82</i>	<i>-2.37</i>
trend	-9.5945	1.3213	-3.3025	0.0926	-0.1361
<i>t</i>	<i>-4.59</i>	<i>0.89</i>	<i>-2.96</i>	<i>1.64</i>	<i>-0.42</i>
N	117	140	140	117	117

**TABLE 2E:** Regressions on a trend (1/10 time unit per year), on an additional trend only for countries that adopt EMU within the sample period, with country fixed effects. Sample: EU15, 1995-2005.

	<b>Lab.Tax (avg)</b>	<b>Lab.Tax (marg)</b>
GovtBudg	0.1344	0.0185
<i>t</i>	<i>1.30</i>	<i>0.13</i>
EMU	-2.3557	-1.2371
<i>t</i>	<i>-5.44</i>	<i>-2.15</i>
N	124	124

**TABLE 2F:** Regression of labour tax rates on on EMU dummy and year dummies, with country fixed effects, controlling for government deficits. Sample: EU15, 1995-2005, where data available.

	<b>Openn.(goods)</b>	<b>Openn.(serv.)</b>	<b>Openn.(FDI)</b>
EMU	5.6671	2.8415	2.3158
<i>t</i>	2.21	1.97	3.72
N	114	114	102

**TABLE 3A:** Simple mean difference between openness indicators before and after EMU observations for the sample of countries that did adopt EMU within the 1995-2005 sample period (Austria, Belgium, Germany, Spain, Finland, France, Greece, Ireland, Italy, Netherlands, Portugal).

	<b>Openn.(goods)</b>	<b>Openn.(serv.)</b>	<b>Openn.(FDI)</b>
EMU	1.6292	0.4829	0.4507
<i>t</i>	1.36	0.29	0.53
N	180	180	178

**TABLE 3B:** Regressions on EMU dummy (equal to unity in 1999-2005 for Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands, Portugal) and year dummies, with country fixed effects. Sample: EU15 (except Greece) and other major OECD countries, 1995-2003.

	<b>Openn.(goods)</b>	<b>Openn.(serv.)</b>	<b>Openn.(FDI)</b>
EMU	1.1908	-0.8699	-0.5266
<i>t</i>	0.83	-0.50	-0.51
N	147	147	134

**TABLE 3C:** Regressions on EMU dummy (equal to unity in 1999-2005 for Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands, Portugal) and year dummies, with country fixed effects. Sample: EU15, 1995-2005.

<i>Tax measure</i>	<i>Emp.rate marginal</i>	<i>Emp.rate average</i>	<i>Emp.rate marginal</i>	<i>Emp.rate marginal</i>	<i>Emp.rate average</i>	<i>Emp.rate average</i>
Labour Tax	-0.1686	-0.4127	-0.0681	0.3088	-0.2735	0.4300
<i>t</i>	-2.80	-5.37	-1.13	2.71	-3.36	2.00
EMU			8.1060		6.6576	
<i>t</i>			4.46		4.17	
Lab. Tx*EMU			-0.1297		-0.1035	
<i>t</i>			-3.92		-3.39	
Op.(goods)				0.4990		0.4747
<i>t</i>				3.00		3.10
Op.(g.) *EMU				-0.0133		-0.0164
<i>t</i>				-4.51		-4.00
N	140	140	140	133	140	133

**TABLE 4A:** Regressions of total employment rate on tax measures and their interactions with EMU dummy (equal to unity in 1999-2005 for Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands, Portugal, in 2002-05 for Greece) or openness indicators, with country and year fixed effects. Sample: EU15, 1995-2004; openness data for Belgium not available in the first 7 years.

	<b>Long term unempl.</b>	<b>Long term unempl.</b>	<b>Long term unempl.</b>	<b>Long term unempl.</b>
EPL(tmp)	0.5826	-0.2611	-0.4094	-0.5466
<i>t</i>	2.38	-1.26	-2.09	-2.80
EMU		-2.5391		-1.5068
<i>t</i>		-5.16		-2.81
EPL(tmp) * EMU		0.2487		0.2521
<i>t</i>		1.31		1.50
Country effects	Yes	Yes	Yes	Yes
Year effects	No	No	Yes	Yes
N	115	115	115	115

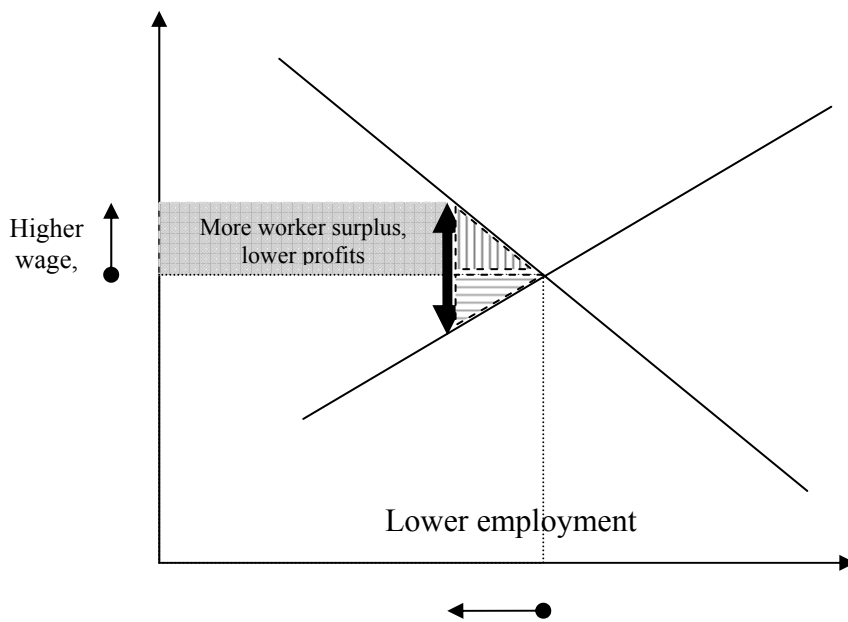
**TABLE 4B:** Regressions of long term unemployment rate on an EPL indicator and its interactions with EMU dummy (equal to unity in 1999-2005 for Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands, Portugal, in 2001-05 for Greece) or openness indicators. Sample: EU15, 1995-2003; openness data for Belgium not available in the first 7 years, EPL indicator not available for Greece.

	<b>Inc.ineq.</b>	<b>Inc.ineq.</b>	<b>Inc.ineq.</b>	<b>Inc.ineq.</b>
GDPp.c.	-0.1749	-0.1622	-0.1921	-0.1482
<i>t</i>	-13.98	-10.27	-24.70	-6.96
EMU	0.2901	-0.0021	0.1323	0.0308
<i>t</i>	2.18	-0.02	1.25	0.25
Pub.Soc.Exp.		-0.0765		-0.0815
<i>t</i>		-2.51		-2.49
Unemp.(tot)		-0.0547	-0.0580	
<i>t</i>		-2.24	-2.26	
IneqDef		0.5451	0.4733	0.5762
<i>t</i>		6.06	4.99	5.61
N	154	151	154	151

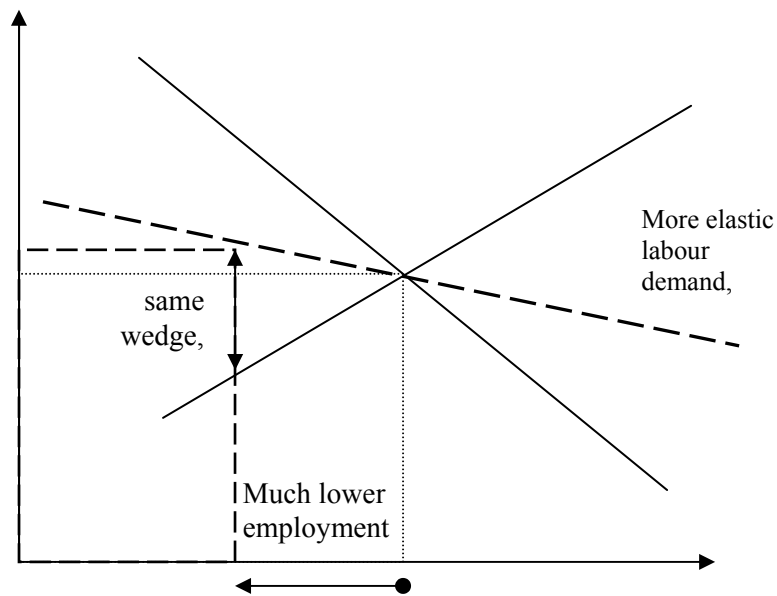
**TABLE 5:** Regressions of income inequality indicators on unemployment, social policy, and EMU dummy (equal to unity in 1999-2005 for Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands, Portugal, in 2001-05 for Greece), all regressions include a constant, all but the first control for inequality definition and measurement method (see Data Appendix). Sample: EU15, 1995-2005 where data available.

	<b>Priv.credit</b>	<b>Priv.credit</b>	<b>Priv.credit</b>	<b>Priv.credit</b>	<b>Priv.credit</b>
Inc.ineq.	7.9252		13.2088		
<i>t</i>	1.29		2.42		
Unemp.(tot)		-4.4948	-4.8482		
<i>t</i>		-5.21	-5.66		
EMU				20.3908	-1.6491
<i>t</i>				2.96	-0.39
Country eff	No	No	No	yes	Yes
Year effects	No	no	no	no	yes
N	116	116	116	94	116
Sample	EU15, 95-05	EU15, 95-05	EU15, 95-05	EMU11, 95-05	EU15, 95-05

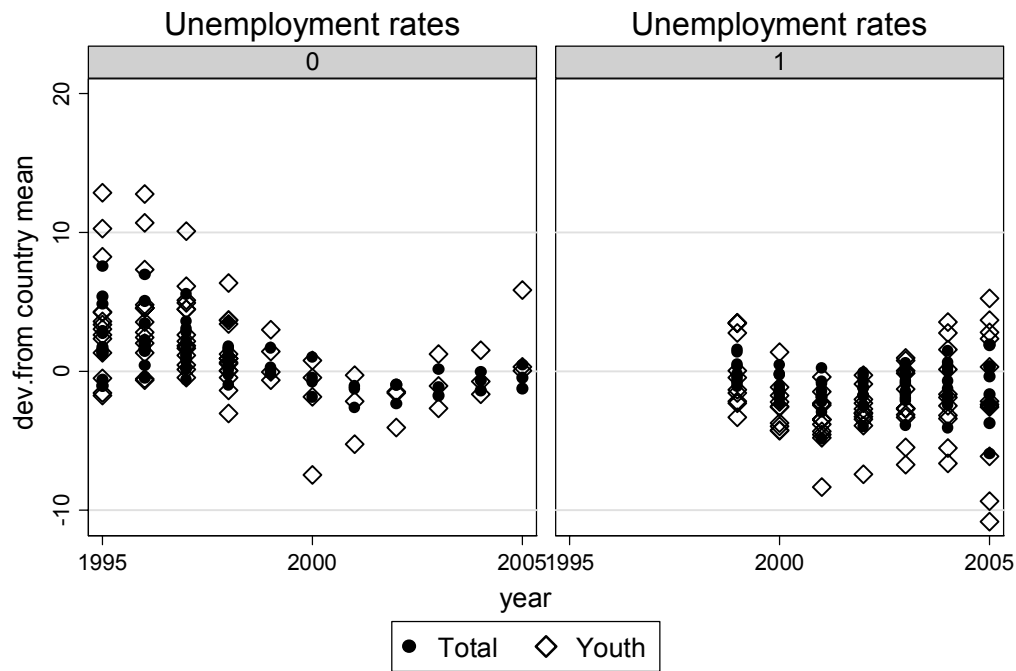
**TABLE 6:** Regressions of private credit/GDP on EMU dummy (equal to unity in 1999-2005 for Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands, Portugal, in 2001-05 for Greece), unemployment, social policy. Regressions include a constant when they do not include country or year fixed effects. Sample: see last row.



**Figure 1:** The effect of minimum wages or labour taxes that finance subsidies to workers. Labour’s surplus increases (and non-labour income declines) by the area of the shaded rectangle. The triangles near the equilibrium points are a labour surplus loss (horizontal shading), and a further profit loss (vertical shading).

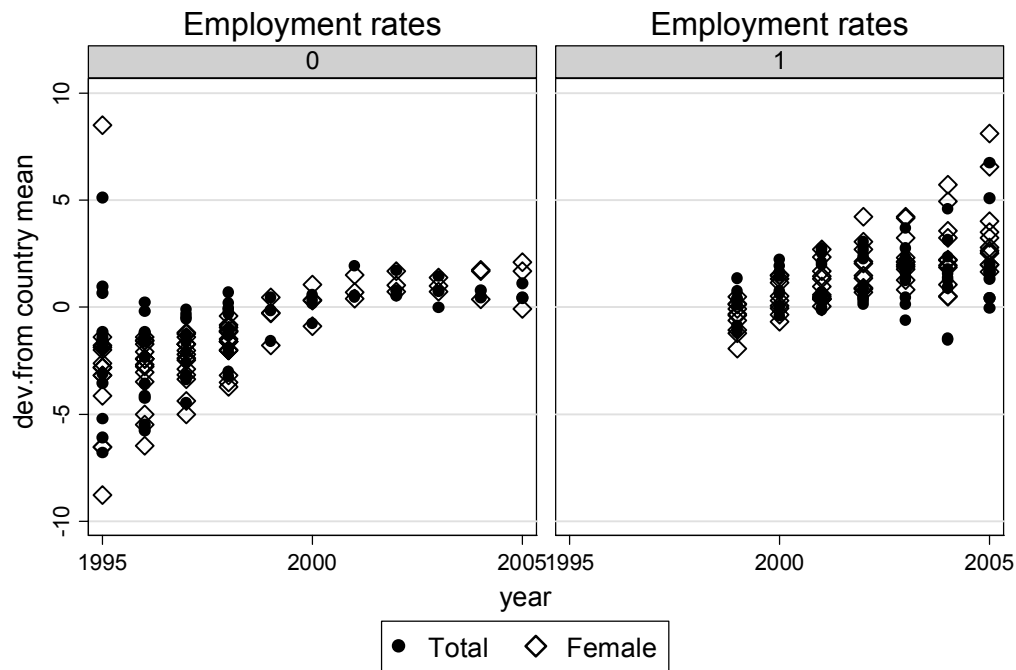


**Figure 2:** Flatter slope of labour demand strengthens the employment and unemployment impact of policy wedges.



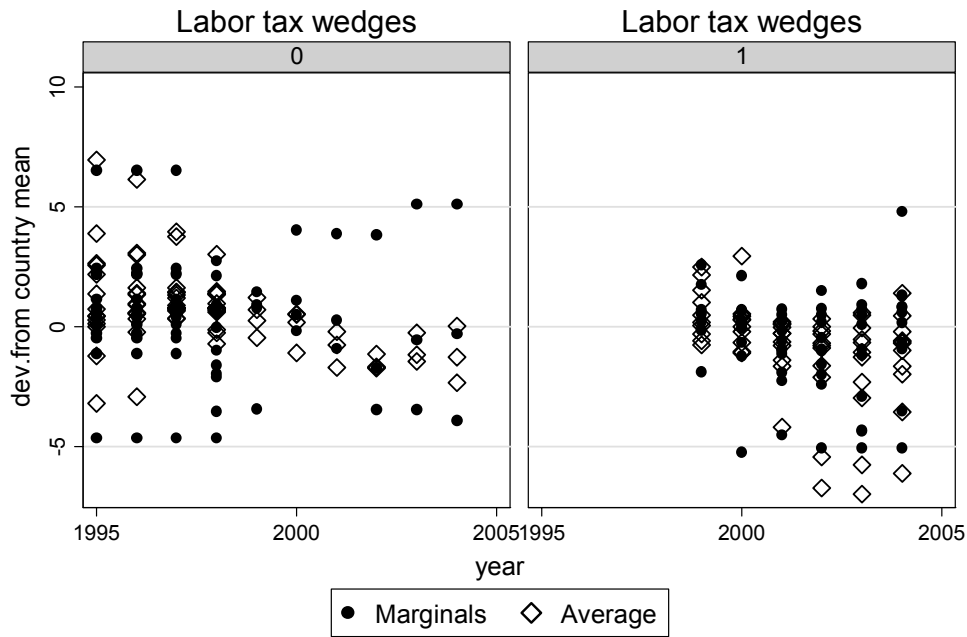
Graphs by emu

**Figure 3:** Deviations from country means of unemployment rates in the EMU and non-EMU subsamples of the EU15. Definitions and sources: see Data appendix.



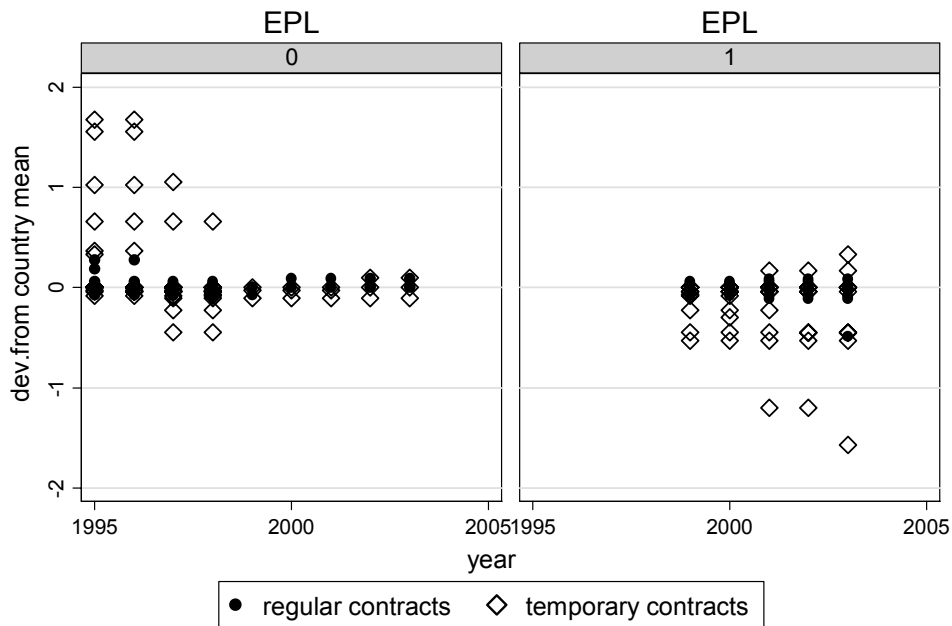
Graphs by emu

**Figure 4:** Deviations from country means of employment rates in the EMU and non-EMU subsamples of the EU15. Definitions and sources: see Data appendix.



Graphs by emu

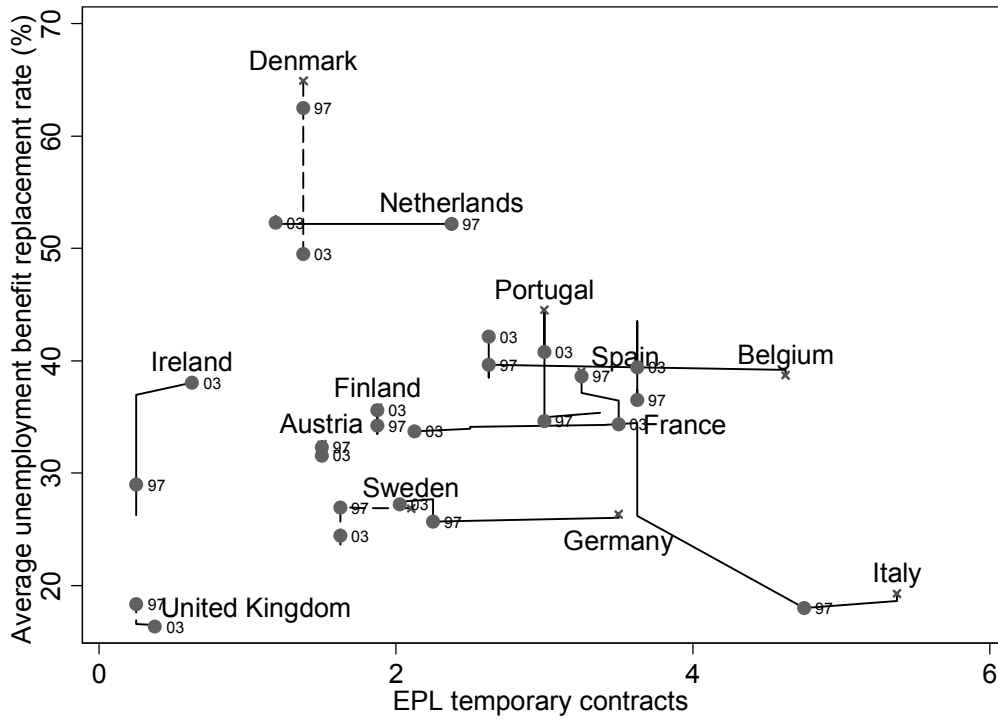
**Figure 5:** Deviations from country means of labor tax rates in the EMU and non-EMU subsamples of the EU15. Definitions and sources: see Data appendix.



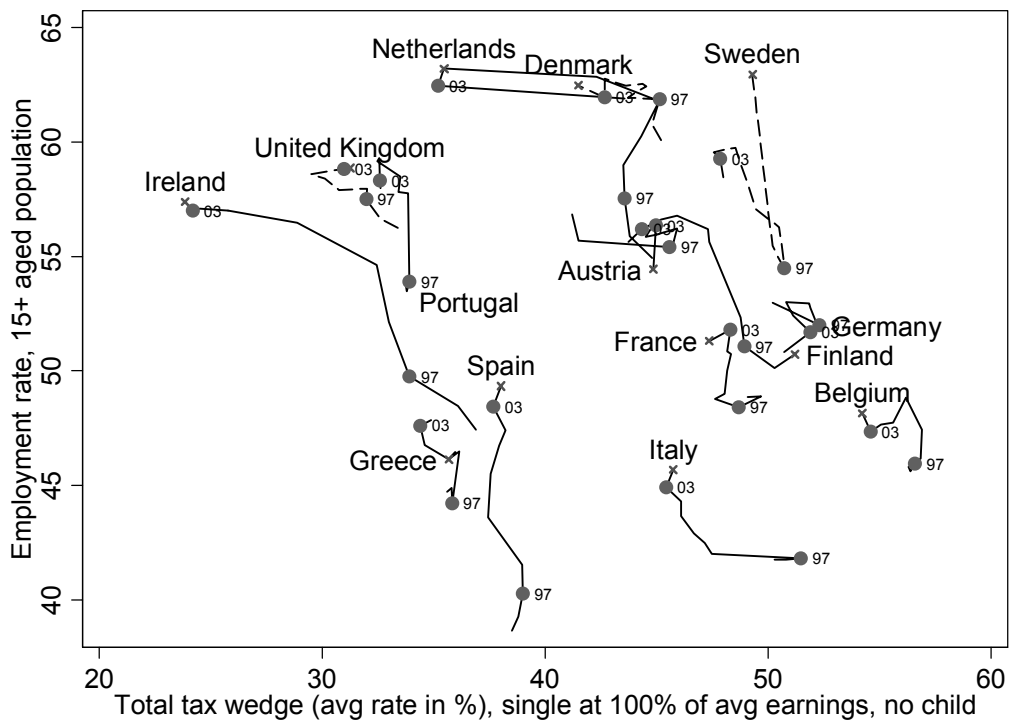
Graphs by emu

**Figure 6:** Deviations from country means of employment protection indicators in the EMU and non-EMU subsamples of the EU15. Definitions and sources: see Data appendix.





**Figure 7:** Employment protection and unemployment insurance in the EU15, 1995-2003. Definitions and sources: see Data Appendix.



**Figure 8:** Employment and labour tax rates in the EU15, 1995-2005. Definitions and sources: see Data Appendix.