

Economic Integration, Growth, Distribution:

Does the euro make a difference?

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Abstract

International economic integration influences not only the average level of income, but also its inequality and instability, and each Nation's ability to equalize and stabilize its citizens' income and consumption by means of policy instruments. This paper discusses whether and how the relevant mechanisms may be at work in the European Economic and Monetary Union context, and inspects available data seeking evidence of relationships between economic integration, adoption of the euro, income and unemployment dynamics, and disposable income inequality. At the same time as in the Eurozone aggregate production and employment performances appear to have improved in comparison to other EU15 countries, its member countries also appear to have experienced increasing inequality and decreasing generosity of social policy. This evidence, while admittedly preliminary and open to a variety of interpretations, suggests that improvement of public and private instruments of income redistribution and risk sharing should have high priority in order to ensure the political and economic sustainability of the Eurozone's and other integration processes.

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1. Introduction

Inequality is an important concern for European citizens, income redistribution is intense at the National level within European Union countries, and feelings of economic insecurity are an important factor in the recent stasis of the European integration process. European countries' economic woes had many causes in the early 2000s, including the worldwide cyclical downswing, competition from newly industrializing trading partners, and slow adoption of new technologies. For public opinion and National politics, however, it has often been easiest to blame them on the most novel and most apparently avoidable aspect of recent experience: the euro and, more generally, deeper and wider economic integration in the European Union (EU).¹

For researchers, economic integration has been a fertile field. Much has been written about the macroeconomic, trade, and productivity implications of economic and monetary integration.² And an extensive if somewhat inconclusive body of theoretical and empirical work has dealt with interactions between economic integration and income inequality within and across countries at vastly different levels of development.³ But little attention has been paid by researchers to inequality issues in the context of the European economic and monetary union experience, or any other experiment of single currency adoption, as the early stages of the European process of economic integration focused on deregulation and production efficiency.

This paper analyzes the implications for growth and income inequality of Stage Three of the European economic and monetary integration process, i.e. adoption of the euro as the single currency (EMU, for brevity, in what follows). Its theoretical discussion and empirical exercises focus specifically on the relationship between inequality, social policy, and inception of the euro. Section 2 outlines possible inequality effects of EMU, through macroeconomic channels

¹ Eurobarometer (see http://europa.eu.int/comm/public_opinion/flash/fl171_en.pdf) found that top reasons for a 'no' vote to the European Constitution referendum by French citizens included '*loss of jobs*' (31%), '*too much unemployment*' (26%), '*economically too liberal*' (19%) and '*not enough social Europe*' (16%). Opposition to the first draft of the Services directive was similarly rooted in the fear that supply of cheap, unregulated labor in Continental European countries would endanger their social welfare models.

² See for example the papers in Baldwin, Bertola, Seabright (2003), and their references to other studies of the impact of EMU on a variety of structural features and economic outcomes, notably the intensity of trade.

³ See, e.g., Spilimbergo, Londoño, and Székely (1999), Sala-i-Martin (2006).

and, especially, because of its implications for market and policy reactions to tight and irrevocable integration of goods and financial markets. Section 3 computes simple statistics in order to try and assess the empirical association between EMU, economic performance, inequality, and social policy. Section 4 concludes outlining the policy implications of the paper's theoretical perspective and results.

2. Income distribution, market integration, and policy

Monetary union's main consequence is the removal of independent macroeconomic policy tools from the member countries. By renouncing its own currency and monetary policy, countries can no longer conduct an independent monetary policy, and exchange rates cease to affect competitiveness. To the extent that the Growth and Stability pact is a binding constraint, fiscal policy instruments are also less than fully available under EMU. As discussed in more detail by Sapir et al (2004), macroeconomic policies can stabilise an economy in the face of imperfectly co-ordinated savings and investment decisions and imperfectly flexible price and wage arrangements. The same fiscal and monetary instruments that can be useful in that context, however, can also generate and propagate aggregate shocks if used in pursuit of objectives different from macroeconomic stability, and can precipitate crises if implemented in unsustainable ways. Monetary union has undoubtedly allowed member countries to achieve stability: in some cases by granting previously elusive credibility; in the case of countries that already implemented sound macroeconomic policies, by preventing spillovers from trading partners' unstable policies.

Stability can clearly foster growth, in that long-horizon investment and innovation decisions are easier and better informed in a more predictable environment. Its relationship with income inequality is less obvious. Of course, macroeconomic volatility can influence incomes differently across different individuals. Wage and unemployment developments are very important determinants of personal income inequality, and labour market features, such as the structure of contracting and the influence of unions in wage setting, affect distribution as well as macroeconomic developments.⁴ If nominal prices and wages are rigid, for example, foregoing

⁴ Arpaia and Pichelmann's (2007) careful analysis uncovers a number of differences in wage adjustment mechanisms across European countries; and it would be interesting in future work to see assess the extent to which country-specific patterns of adjustment reflect institutional and/or economic structure features.

devaluations may require sharper activity slowdowns, unemployment increases, and consumption wage reductions for the purpose of restoring competitiveness. Credibly ruling out devaluation options may however enforce wage moderation at any given level of unemployment, while in conditions of poor monetary policy credibility wage negotiations would routinely discount devaluation and imply real wage rigidity, attempting to shift purchasing power losses toward bondholders or to fixed-income earners other than workers.

More generally, it is doubtful that National macroeconomic policy and labor market reactions would be able to support favorable 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, blunting 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 to be a source rather than a remedy for national economic fluctuations (Darvas, Szapáry, and Rose, 2005). 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.

From this market-oriented perspective, EMU does not only deprive its member countries' of macroeconomic policy independence: it also opens the way to new market forces and new sources of shocks. Adopting a single currency is also an extremely important step towards full integration of microeconomic market interactions. The absence of currency risk improves price transparency, reduces the extent to which price and wage stickiness may blur relative productivity signals, and supports economies of scale in deeper, no longer segmented markets for goods, services, and financial products. Wider and deeper market integration fosters efficiency both through such direct channels, and 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).

2.1 Integration, distribution, and risk

Like any change, however, economic integration affects not only the aggregate economic system's efficiency, but also the distribution of income and welfare. Diversion of trade from within to across countries' borders can benefit some producers and damage others. Most intuitively, integration with poorer countries may increase inequality in rich countries, as their poor citizens' incomes are bid down by competition from substitutable workers in poor countries. More generally, however, factors of production can be complementary rather than substitutable across borders.⁵ And factors can move or accumulate over time, in ways that influence patterns of production and income across countries and individuals interacting in integrated markets. If income is higher and returns to investment lower where more capital is available, integration should reduce inequality as production grows faster where it is initially low; but if production exploits increasing returns instead, market integration can increase income inequality.⁶

The interplay between these channels implies that the inequality impact of integration is theoretically ambiguous overall, and amenable to empirical investigation. In practice, inequality in most advanced countries has been increasing since the 1970s, bringing to an end a long decline in the earlier part of the 20th century.⁷ This pattern broadly parallels that of global economic integration indicators, but it is difficult to identify the effects of economic integration separately from those of technological change. On the one hand, because the extent of economic integration is shaped by progress in transportation and communication technologies, as well as by trade liberalization and other policy trends. On the other hand, because the two phenomena have similar effects on the distribution of incomes in advanced countries. A portion of the observed increase in income inequality is accounted for by widening pay differentials across education levels, and may be explained by mechanisms whereby unskilled workers are substituted (and skilled workers complemented) by machines and/or by less developed countries' labour.

A particularly welfare-relevant portion of income inequality, however, may reflect *ex post* random events rather than *ex ante*, permanent factors. The volatility of each worker's income

⁵ See O'Rourke (2001) for a very clear overview of mechanisms and evidence.

⁶ Bertola, Foellmi, and Zweimueller (2006) offer an exhaustive introduction to the relevant interaction channels, with particular emphasis on the role of financial market structure in determining convergence or divergence across individuals as well as across countries and regions.

⁷ See Piketty and Saez (2006) and their references.

over his or her lifetime may also be related to economic integration: as more widely integrated markets react more promptly and more sharply to differences in prices, small cost shocks can have dramatic effects on production. Survey evidence indicates that perceived labour market risk is higher for workers working in more internationalized sectors (Scheve and Slaughter, 2004), and that, even though integration is expected to be beneficial on average, the average individual is against immigration and trade in most countries. Higher aggregate production levels are not unambiguously beneficial when markets (especially financial markets) are imperfect and incomplete, making it impossible to assess welfare on a “representative individual” basis. As integration changes the distribution of income and of consumption across heterogeneous agents, attitudes towards it depend on whether individual agents expect to find themselves above or below the average of income changes. In surveys, opposition to economic integration is indeed sensibly stronger on the part of individuals who are theoretically more likely to be damaged by it, such as low-skilled workers in countries that receive low-skilled migration inflows (see Mayda, O’Rourke, and Sinnott, 2007).

Studies of such channels of interactions have mostly focused on economic integration between countries at vastly different levels of development, as in the case of North/South globalization patterns or of the EU’s enlargement to transition countries. Economic integration among countries with similar endowments, such as the original six members of what is now the European Union and the current Eurozone members, has often been supposed to yield mostly economies of scale and of variety, with little (if any) implications for within-country income distribution. Different aspects coexist in all economic integration experiences, however, and there is no reason to expect any income-volatility implications of economic integration to be less pronounced in the case of Eurozone countries than in that of more diverse, but less tightly integrated economies. And in light of Continental Europe’s pervasive Welfare State tradition, it is particularly interesting in the EMU context to consider interactions between integration of the markets where individual agents’ decisions take place, and implementation of collective policies.

2.2 Social policy

Citizens of countries do not only interact through markets. Reducing *ex ante* inequality can be desirable in order to foster social cohesion, and redistribution policies can offset *ex post* income shocks when information and implementation problems prevent insurance markets from smoothing out their welfare impact. If imperfect and incomplete information does not make it

possible to distinguish random events from the effects of individual efforts, however, then redistribution decreases production efficiency at the same time as it reduces the role of luck in the determination of individual welfare.

Thus social policy, like all policies, has desirable and undesirable effects, whose relative strength depends on the economy's characteristics. The impact of economic integration on its implementation is twofold. On the one hand, new cross-border sources of risk increase the appeal of policies meant to buffer the welfare implications of uninsurable risk, and may explain why more open countries' governments are more deeply involved in economic matters (Rodrik, 1998).

On the other hand, international economic integration also affects on the viability of National redistribution policies. Wider, less constrained market interactions improve efficiency because they offer more choices to individual economic agents. But they also make it more difficult for policies to shape individual choices differently from what would be implied by unavoidably imperfect market mechanisms. Depending on whether demand or supply influences dominate, accordingly, integration may in practice increase or decrease the intensity of collective redistribution and other interferences with laissez fair markets at the country level (Agell, 2002; Bertola and Boeri, 2002). Survey evidence indicates that attitudes towards economic integration are also shaped by their impact on redistribution policies (Facchini and Mayda, 2006). Hence, economic integration's political sustainability may well require coordination of social policies at the same level as that of market interactions (Bertola, 2006).

3. Income distribution in EMU

The previous section's review of theoretical insights suggests that the impact of integration on inequality is ambiguous overall, but plays out through well-defined and policy-relevant channels of interaction. Identifying such channels and assessing overall inequality effects is an essentially empirical problem, albeit a very difficult one, which this section explores focusing on the possible effects of EMU on social policy and inequality.

For a useful set of countries and periods, Eurostat reports on a harmonized basis the "quintile ratio" inequality indicator, i.e. the ratio of income earned by the top quintile of the population to that earned by the bottom quintile, for household equivalised disposable income. This statistic, which would be equal to one in the case of perfect equality, ranges up to infinity as less income accrues to the bottom fifth of the households, and more to the top fifth. It is of

course not an ideal index of inequality, both because it may fail to capture important changes in the middle of the income distribution, and because it may or may not be related to income volatility and consumption dispersion. It cannot be beaten for this paper's purposes, however, because no other suitably comparable data are available for the countries and period of interest.

Eurostat publishes measures of the quintile ratio for a variety of EU aggregates. As shown in Figure 1, a rather sharp swing occurred in this measure of EU15 inequality around adoption of the euro. According to the Eurostat indicator, inequality was declining until 2000, remained flat through 2001, and increased very sharply back to its 1996 level by 2004. The swing is if anything sharper, in both directions, for the aggregate of the first 12 Eurozone countries. The latest available data refer to 2005, when Eurostat reports that inequality declined in the Eurozone and remained flat across all the EU15.

What may account for these inequality dynamics? Across EMU countries, not only individual incomes but also many other economic variables have begun to diverge after adoption of the euro. One reason why individual incomes may become more unequal is, of course, increasing inequality across countries. As Figure 2 shows, however, country-level incomes have continued to converge in Europe (Luxembourg is omitted, to reduce the size the horizontal axis and improve legibility). Convergence rates, as measured by the slope of the regressions of growth on initial income shown in the Figure, are very similar before and after EMU, and for countries that did and did not join the Eurozone. Thus, there is no indication that tighter economic integration fosters convergence, as is theoretically possible in the absence of strong agglomeration effects; more detailed studies paint a similarly pessimistic picture of macroeconomic variables' convergence in EMU (see Roubini, Parisi-Capone, and Menegatti, 2007, and its references). The data in Figure 2 also make it clear that growth has certainly slowed down rather uniformly after 2000 in most countries. Slower and/or more variable growth in the cyclical slowdown phase may or may be affected by EMU, as both fiscal and monetary policy were already blunt in the after-Maastricht run-up to EMU when individual countries faced stringent exchange rate and budget constraints. But it will be important in what follows account for aggregate dynamics when characterizing the association between EMU membership and within-country inequality.⁸

⁸ Countercyclical variation in wage inequality and volatility has been documented by many authors, including Storesletten, Telmer and Yaron (2004), mainly on American data. The

Eurostat also publishes similar indicators of within-country inequality. The raw data plotted in Figure 3 for each of EU15 countries between 1995 and 2005 in several cases also follow a U-shaped path around the turn of the millennium. While changes in inequality statistics may appear small, they are relevant because the efficiency effects of integration are also apparently small,⁹ and because small changes in broad inequality statistics can hide dramatic changes in individual circumstance. *Ex ante* uncertainty about who exactly will lose out can foster resistance to reforms (inducing in policy choices the “status quo bias” of Fernandez and Rodrik, 1991). And to the extent that higher inequality across individuals results from more pronounced instability over time of individual incomes, the associated increase in uninsurable consumption volatility may well be such as to more than compensate higher levels and faster growth of consumption and income (see Krebs, Krishna, and Maloney, 2005, for a model and some relevant evidence).

The data shown in Figure 3 also indicate that inequality levels are very different across countries. A portion of the large swing in Figure 1 is accounted for by composition effects, i.e., by high-inequality countries growing in importance within the aggregate at times of increasing inequality and vice versa, but the available data are too scarce to ascertain whether any such composition effects may be structural. The next subsections studies the relationship between inequality levels and other variables of interest, and the joint dynamics of EMU, growth, and country-specific inequality developments that, while smaller than those observed in the EU15 and Eurozone aggregates, prove to be statistically significant, and can arguably be very important for attitudes towards integration in country-level political debates.

3.1 Configurations

regressions below assess inequality developments controlling for both income and unemployment fluctuations and trends. In European countries wages tend to be inflexible and cyclical fluctuations might instead be reflected in unemployment, which however tends to reflect structural and institutional as well as cyclical factors. Detailed analysis of the influence of labour market institutions on wage dispersion and more general inequality measures and may be found in Checchi and Garcia Peñalosa (2005) and Koeniger, Leonardi, and Nunziata (2004).

⁹ The Single Market Program was estimated in the 1988 Cecchini Report to increase European GDP by some 2-6%, and in 1996 the effects of the first four years was estimated to be some 1.1-1.5% higher GDP; completion of a single market in services, according to the European Commission’s revised Lisbon Strategy communication (COM(2005) 24), would increase GDP by 0.6% and employment by 0.3% in the medium run.

Table 1 displays summary statistics for a sample of 11 yearly observations in 14 countries.¹⁰ All 154 observations are available for the measures of income, unemployment, inequality, and country size defined in the table's notes. In the sample, the inequality indicator ranges between 2.9 and 8.2 across countries and over time. These and other summary statistics may be useful in order to assess the quantitative relevance of the coefficients in the following tables.

Before turning to statistical assessment of the relationship between inequality and EMU, it is useful to inspect the available data graphically in order and assess the size and character of variation across relevant dimensions of cross-country heterogeneity. Figure 4 displays the remarkably strong negative relationship between the available inequality indicator and real per capita income. In these data, there is a strong tendency for richer countries to feature lower disposable inequality (while, as the regressions below document, the relationship of inequality to country size is significant, but not as strong as one might expect, and its relationship with unemployment is significant in interesting ways).

As shown in Figure 5, richer countries also devote a larger fraction of their larger income to redistribution. In this and the other figures it is possible to detect well-known patterns of clustering across countries: Nordic ones such as Sweden, Denmark, and Finland feature particularly generous social spending and particularly low inequality; Mediterranean ones such as Portugal and Greece are at the opposite extreme in both respects; and the Anglo-Saxon observations for Ireland and the United Kingdom tend to feature more inequality and lower social spending than would be expected on the basis of their income and of overall cross-country relationships.

Income does appear to be very strongly related to inequality and social spending in these data, but of course the relationship need not be read as in causal terms. Taxes and subsidies may in principle perform efficiency-enhancing roles that are beyond reach of imperfectly and incompletely informed markets. As mentioned above, however, governments' attempts to do so, however, may well encounter much the same information and incentive problems as private market participants, so that more social spending may improve equality only at the expense of

¹⁰ Luxembourg observations are outliers, and excluded for the sake of sample homogeneity. While Luxembourg's inequality indicator is very similar to that of Belgium and of the Netherlands in Figure 3, that country's small size, very high per capita GDP, and peculiar financial specialization may spuriously affect relationships between these and other relevant variables, which are different enough from those prevailing across the countries to affect the results' significance.

efficiency and aggregate production. Countries may well differ not only in terms of the political appeal of movements along such trade-offs, but also in terms of their ability to produce aggregate income. As the negative side effects of social policy are less serious for countries that are richer to begin with for geographical and historical reasons, such countries may well implement more extensive redistribution than poorer ones where strenuous effort is absolutely necessary. Figure 6 conversely shows that across the United States there is a negative relationship between per capita income and (net) transfers, financed in good part by uniform taxes and contributions. This is doubtlessly also the case across regions within European countries, and indeed across households within each. But over a roughly comparable range of income levels (the United States 2002 data are in current dollars, while the EU income variables in the various years are in 1995 euro) citizens of the EU receive more generous subsidies when they live in richer member countries, for reasons that are obvious in light of the National character of social policy in the EU, and will be discussed further in the conclusions below.

While these strong relationship between income and social policy cannot easily be interpreted in structural terms, social policy does matter for inequality. Figure 7 shows that more generous social spending is negatively associated with disposable income inequality. And the same is also true after accounting for the relationship between (possibly exogenous) income levels and inequality, as shown in Figure 8. In these as in all other bivariate relationships illustrated by this section's figures, observations were pooled over time as well as across countries. It is however clear, particularly in Figure 8, that not only income but also social policy and inequality feature interesting time-series variation along these relationships, and that there is substantial variation around each of the regression lines that might be driven through the data. This makes it interesting to explore next how such variation may be related to EMU membership along both the time-series and cross-sectional dimensions.

3.2 What has happened?

The effects of EMU are hard to gauge on inequality, and any other outcome of interest, because many confounding factors may affect observed correlations. The coincidence of EMU developments with enlargement and global cycles, the limited time elapsed from adoption of the euro, the uncertain timing of the latter; all makes it difficult to rely on statistical methods. But the issues are sufficiently important to warrant investigation, albeit on the basis of imperfect data and imprecise assessments. The empirical exercises below are in the spirit of Barr, Breedon, and Miles (2003), which focuses on trade, foreign direct investment (FDI) flows

and financial market activity and also briefly considers aspects of macroeconomic performance. In that and other papers in Baldwin, Bertola, Seabright (2003), difficult choices are necessary as regards the definition of EMU in terms of the country composition and dating of the newly integrated economic entity. The analysis and results of this subsection have the same important limitations and qualifications, but also have the advantage of a longer post-EMU observation span, and offer a novel set of findings on income distribution and social policy indicators.

The time interval covered by the data set introduced above is conveniently symmetric around dates that might correspond to adoption of the euro. Available data also span a boom-bust episode, and this makes it possible to control for cyclical influences on inequality and social spending. Unfortunately, lack of comparable data for earlier cycles makes it impossible to assess whether the relationship between inequality and macroeconomic conditions has been affected by EMU. Needless to say, countless other high-order issues cannot be addressed by these data, which however appear to be the best available and suitable enough to provide at least rough insights into very important issues.

In the spirit of the “differences in differences” methodology, two dummy variables account for the common characteristics of countries that have so far joined the Eurozone, and for the effects that are peculiar to those countries after joining. EMU0 is equal to unity throughout the available sample for all the countries that have adopted the single currency as of 2005, and equal to zero for the other EU15 countries. Some specifications allow for country-specific intercepts, and omit the (redundant) EMU0 dummy. Another dummy variable, 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. Anticipation and lags may be relevant to those effects, of course, but one-year changes in the dating of the EMU=1 observations make very little difference to the results reported below.

In practice, in each of the regressions below the coefficient of the EMU0 dummy variable captures the effect of being a country that (sooner or later, in the sample) joins the Eurozone, and the coefficient of the EMU dummy captures the effect (given that you are that kind of country, if EMU0 also appears) of actually having joined the Eurozone. The presence in the sample of countries that did not adopt the euro controls, to the limited extent possible, for the influence of the global cycle, of EU enlargement, and of other developments occurring at

roughly the same time as EMU: the coefficient of the EMU dummy may be influenced by events occurring over the period it identifies only to the extent that such events affects Eurozone countries differently from Denmark, Sweden, and the UK. While this comparison group is of course far from ideal, the results are reassuringly robust to exclusion of any one of these three countries, and to inclusion in the non-EMU group of EFTA countries for which reasonably complete data are available.¹¹

Closer economic integration is expected to foster productivity and growth. The regression coefficients reported in the first two columns of Table 2 indicate that economic performance, both in terms of per capita income and in terms of unemployment, does improves significantly with EMU for countries that, as indicated by the coefficient of the EMU0 dummy, tend as a group to do worse than the comparison group of Denmark, Sweden, and the United Kingdom. The estimates of the EMU0 and EMU coefficient are robust in terms of sign and significance when country dummies are included among the explanatory variables in columns (3) and (4). The striking improvement of the regression's fit indicates that, not surprisingly, a very large proportion of the variation is across countries rather than over time. Examining the data from this perspective will prove informative, in different ways, in many of the regression specifications that follow: the variables of interest vary mostly across countries, within as well as across EMU and non-EMU groupings; but while time-series within-country variation is modest, it is sufficient and sufficiently related to the EMU dummy to yield significant coefficients in most cases for that dummy and for interesting control variables below.

The simple results reported in the Table indicate that Eurozone countries' output is higher after joining than that of countries that opted out. Higher output may result from lesser interference with efficient market interactions unemployment, which is over the full sample higher in current Eurozone countries, has after their adoption of the single country indeed declined more than in the control group. Higher efficiency is also expected to result from deeper integration itself. Columns (5-7) regress indicators of economic integration, in the form of 'openness' ratios for goods, services, and FDI, on the EMU and EMU0 dummies as well as on

¹¹ Data for Norway (available from 1997) and for Iceland (only available in 2004-05) make a small difference to the results when included in the regressions below as part of the non-EMU control group. Inequality data are not available for Switzerland. Data for EU27 countries other than the EU15 and for Turkey offer interesting additional insights into the relationship between inequality, income, and social spending. But new member states' data only begin to be available in 2000, and as of 2005 do not as yet include any Eurozone member. Hence, they are not useful for this paper's purpose of assessing empirical patterns before and after EMU.

country population, as a rough control for the fact that larger countries are naturally less open to international transactions. The significantly negative coefficient of population confirms this prior, and the positive coefficient of the EMU dummy indicates that the economic effects of adopting the single currency do work through international channels.¹² The effect on FDI is especially strong and (in results not shown) remains roughly as large and highly significant also when controlling for income and for country effects.

Integration is expected to make it more difficult for countries to implement uncoordinated policies interfering with market outcomes. As mentioned, evidence of lower unemployment is consistent with this prediction, to the extent that unemployment is a consequence of such interference, as well as with the fact that high unemployment may have been a consequence of attempts to achieve credibility on the part of National macroeconomic policy maker in the run-up to EMU. But lower output and higher unemployment may also be side effects of interference with market outcomes that is meant to reduce labour income dispersion and instability: from this perspective, economic integration may foster efficiency and “growth” at the expense of equality or “cohesion”, an example of the tension between different policy objectives of the type discussed in Sapir et al (2002).

In order to begin to assess the relationship between euro adoption on the one hand, and the level and changes of inequality on the other hand, Table 3 applies the same approach of Table 2 to the quintile ratio indicator of income inequality as the dependent variable of descriptive regressions including as explanatory variables per capita income (as suggested by the strong association with inequality in Figure 4), population (as a rough control for the likely higher heterogeneity of larger countries), and unemployment (which begs to be included in light of its large variation across countries and EMU status in Table 2 and, as we shall see, has significant and interesting coefficients). Social policy, as we saw in Figures 5 and 8, is also significantly associated with inequality, but the available indicator is not yet included in this Table’s regression: accordingly, the association between social policy and inequality is absorbed by the coefficients of EMU and of other variables that co-vary with social policy indicator.

¹² While efficiency-enhancing competitive pressure does not need to result in larger imports and exports, exploitation of comparative advantage and economies of scale does imply larger measured openness, and there is a vast literature on the trade effects of the euro and other common currency: see e.g. Micco, Stein, and Ordóñez (2003) and its references.

The estimates in the first column indicate that the EMU membership dummy is associated with higher inequality. The coefficient of the EMU0 dummy, included in the specification reported in column (2), indicates that higher inequality is to some extent a permanent characteristic of the group of countries that eventually joined EMU, rather than a possible effect of EMU observed in those countries after joining. But including a full set of country dummies, in column (3), yields a very significant and again sizable effect of EMU, while inequality is not significantly higher in EMU when all controls are omitted (the simple mean difference between EMU and other observations is sizable at 0.21, but the t statistic is only 0.60), and it is significantly lower if country-specific intercepts (not reported) are allowed for.

To interpret these mixed results, it is important to recognize that in these descriptive regressions any effect of closer integration on unemployment and income reduces the information conveyed by the coefficient of the EMU dummy. Hence, the coefficients of the control variables also deserve to be discussed briefly. Country size, as captured by population, has a small but fairly significant positive coefficient. Income's coefficient is positive, consistently with the strong bivariate relationship shown in Figure 4 above. Interestingly, the coefficient of unemployment is negative: inequality of household disposable income, after controlling for the other variables in the regression, is lower when a country's average unemployment rate is higher.¹³ This may indicate that most of the variation in unemployment is due to institutional features that keep wages higher than market clearing, rather than to differences in the efficiency of worker-job matching. If employed workers earn higher wages, tend to be older, and live in the same households as more numerous unemployed youth, there will be little impact on income inequality across working households.¹⁴

Another indicator that may be affected by economic integration and is potentially relevant to personal inequality is the share of labour income. As discussed in Section 2, economic integration may affect income distribution by allowing private agents to exploit cross-border opportunities. The higher mobility of capital may make it better able to do so

¹³ Experimenting with indicators of regional unemployment dispersion yields no significant results.

¹⁴ The relationship between unemployment and inequality is indeed interestingly different when the latter is measured in terms of wages rather than of equalised income. Bertola, Blau, and Kahn (2002), for example, find that when wage inequality and unemployment are measured in terms of deviations from country means, so as to control at least roughly for other factors influencing both, they are negatively related, consistently with the idea that tighter wage compression generates more unemployment among low-productivity workers.

(consistently with the large FDI effects measured in Table 2) and this may affect personal income distribution if, as is realistic, financial wealth is more unequally distributed than labour earnings, and/or workers have limited access to financial instruments. A readily available proxy variable for the relevance of this phenomenon is the share in GDP of gross wages and salaries, provided by Eurostat for all countries and years in the sample of interest (with the exception of Portugal 1999-2005). As shown in columns (4-6) of Table 3, the wage income share does decline with the EMU dummy and rather sharply, by some 3 to 5 percentage points depending on the presence of other control variables. Interestingly, however, the wage share is completely irrelevant to personal income inequality when included in the regression of column (7).

As shown in Figures 7 and 8, conversely, the share of social expenditure in aggregate income is very importantly associated with inequality. The regressions reported in Table 4 add that variable to regression specifications that are otherwise similar to those in Table 3. If social expenditure is controlled for, the coefficient of EMU as a determinant of inequality is only very mildly positive and insignificant. When country dummies are included in the column (4) of Table 4, the EMU coefficient is negative and marginally significant, and the signs of unemployment and income interestingly switch signs. Income was negatively associated with inequality in Figure 5 and in regressions that allow its coefficient to be influenced by cross-country variation, but cyclically low aggregate income increases inequality when permanent country effects are controlled for. Similarly, high average unemployment has a negative partial association with disposable income inequality across countries, but the regression in column (4) of Table 4, indicate that, within each country, cyclical or trend variations in unemployment and in per capita are both positively associated with inequality.

While the direct influence of the EMU dummy in regressions that control for social spending is small and ambiguous, the negative and rather significant coefficient of social spending in inequality regressions begs the question of whether EMU may influence inequality indirectly, through differences in social spending in the aftermath of euro adoption. The regressions in Table 5 tell us that social expenditure is lower on average in Eurozone countries, both overall – as indicated by the negative and significant coefficient of the EMU0 dummy – and, more interestingly, after adoption of the euro (if less significantly if EMU0 is included, and insignificantly if country effects are allowed in the last column, which is a mirror image of the previous table's corresponding well-fitting specification of relationships between within-country dynamics of jointly endogenous variables). The negative coefficient of population size may be interpreted in terms of the administrative difficulties and additional distortions entailed by

social policies when countries are highly heterogeneous, perhaps in terms of ethnic fractionalization (Alesina et al, 2004).

4. The future

The statistical results reported in Section 3 have to be taken with a large grain of salt, because the data's quality and quantity are certainly not such as to provide fully reliable information. But the various pieces of evidence may be painting a picture of post-EMU evolution that is intriguingly consistent with highly policy-relevant theoretical perspectives. EMU appears to be associated with better aggregate economic performance, but also with somewhat higher inequality and lower social spending within countries joining the Eurozone. This may indicate that economic integration's inequality effects are mediated by (comparatively, in comparison to pre-EMU and non-EMU) less generous social policy, and that some of the apparent increase in country output may well reflect smaller incentive effects of redistribution, rather than more efficient international market interaction.

Whether such developments should be viewed as good news depends of course on the side of redistribution budgets one finds himself on, and on whether one views redistribution as a suitable or a misguided tool for pursuing goals that financial markets should in principle but might in practice fail to achieve. Interestingly, rather sharp declines in unemployment and wage shares appear to play a minor role in determining inequality developments. This may indicate that changes in the overall size and distribution of capital income have fostered income equality, and that EMU and other structural and policy developments may be inducing substitution of private financial instruments for the labour market regulations and decentralized public redistribution schemes that are less viable in a tightly integrated system of markets. Financial market development can indeed fulfil some of the needs addressed by social policy in theory. It would be interesting to find out whether it does so within EMU countries as well as at the global level (see Bertola, 2007b, for further discussion and evidence). But exploration of the World Bank data used in that paper uncovers no relationship between EMU dummies and quantitative indicators of financial development, at least when the comparison group is the admittedly weak one including non-Eurozone members of the EU15.

The evidence of possible difficulties in the implementation of uncoordinated social policy in tightly integrated economies, with positive effects on aggregate income but higher inequality, is only circumstantial, and no verdict may be passed yet: the jury will have to remain out until

more plentiful and better data become available. In the meantime, however, it would be wrong to disregard linkages between economic integration and not only growth, but also the sources and remedies of income inequality.

While this paper focuses on inequality within rather than across countries, the two are related in obvious and less obvious ways. Within the EU and within EMU, richer countries tend to feature higher social spending. Hence, any lack of convergence of relatively poor countries' per capita incomes also hinders decline of their within-country inequality: high incomes are associated with generous social policies across EU member countries (see Figure 6) and, as argued by Sapir et al (2004), aggregate income growth is also a necessary condition for the feasibility of redistributive social policy. When trying to speculate about the possible evolution of the EMU project as regards inequality and social policy, it is very interesting to consider the contrast between the EU and United States configurations in terms of the relationship between income levels and transfer levels. As shown in Figures 6 and 7, the sign of the income-transfers correlation is the opposite in the US, where residents of poor States receive more from a largely Federal welfare system, and in the EU, where country-specific welfare systems are more generous in poorer member countries. The overall generosity of the United States welfare system is also lower than that of comparably rich EU countries, as Federal co-financing schemes may not suffice to prevent race-to-the-bottom tendencies in a tightly integrated economy with high labour mobility.

But can EU countries continue to develop an ever tighter web of private markets without reforming and integrating their social policy systems, possibly to the lower levels and Federal configuration of their United States counterparts? In the current configuration of the EU, free mobility of goods and factors, local decision-making powers in the social protection area, and inequality prevention similarly coexist uneasily (Bertola, 2007b). All three are desirable goals of the European Union's system of policies: unfettered market interactions foster efficiency and growth; country-level social policy decisions have obvious appeal in light of the vast variety of configurations and historical traditions across member countries; and effective poverty-prevention policies are needed, in Europe as in the US, both to foster social and political peace, and to remedy the efficiency consequences of financial market imperfection. But pursuing two of the three goals implies forsaking the third, just as before EMU uncoordinated macroeconomic policies, fixed exchange rate, and free trade with capital mobility could not be consistent with each other: one had to be abandoned.

In the Eurozone, macroeconomic policy independence was given up, and the tight and irrevocable integration of its markets may call for forms of effective policy integration in the social policy area as well. Difficulties arise from the fact that different countries approach similar problems differently, in ways that reflect their own history and economic structure and lack of common grounds for political debate. So far, effective economic integration has been limited, especially as regards labour mobility and trade in services. Over time, as ever deeper integration takes place in all markets, solidarity schemes may develop across the European Union as they did in the United States. As long as some risk management pertains to policy rather than markets, the scope of policy should coincide with that of markets to the extent possible, and it is no less inconsistent to imagine a Single Market without a coherent welfare policy system as it was to try and run independent macroeconomic policies under fixed exchange rates in conditions of free capital mobility. But the very wide heterogeneity of economic circumstances and social traditions across the Eurozone and the EU may well make it difficult to build a harmonious common welfare infrastructure. And the importance of redistribution policy may well have to decline relative to that of markets, perhaps approaching a configuration similar to that of the United States where, for example, interstate private financial flows play an important consumption-smoothing role alongside local and Federal taxes and transfers (see Salemlı-Ozcan, Sorensen, and Yosha, 2004, and its references).

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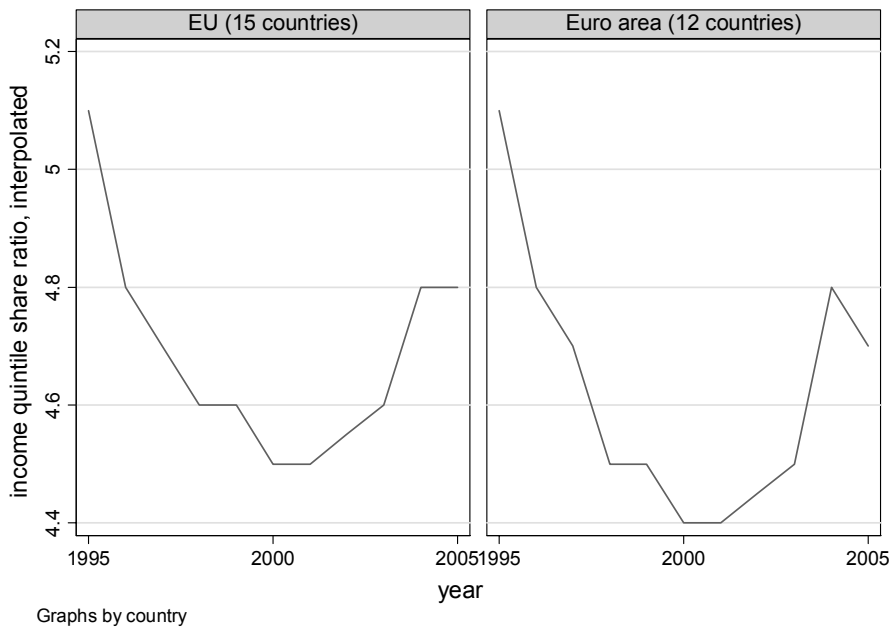


Figure 1 - Evolution of inequality, as measured by the income quintile ratio, in the EU15 and Euroarea12 aggregates. *Source: Eurostat.*

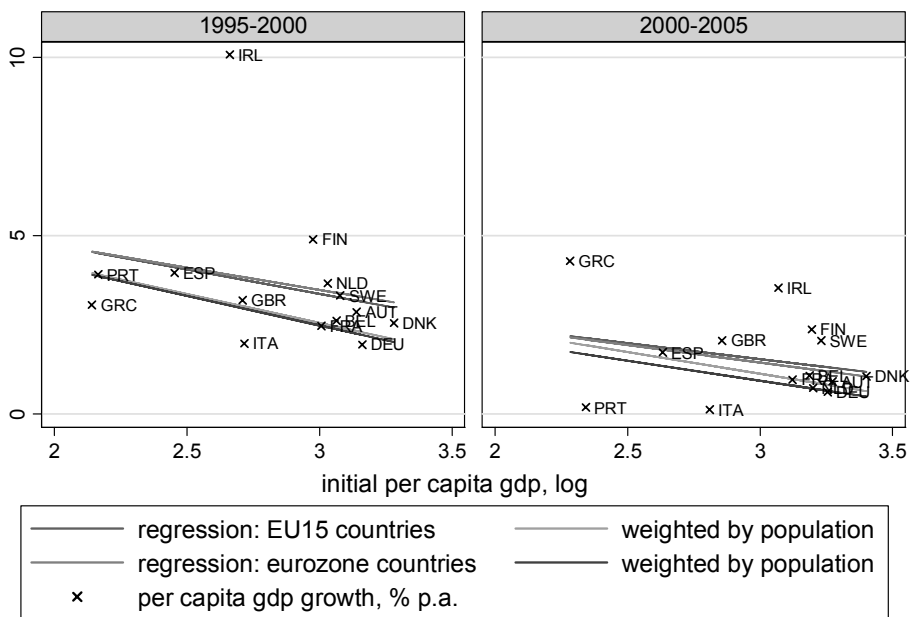


Figure 2 - Relation between initial per capita GDP and subsequent growth across EU15 countries (Luxembourg is excluded); GDP is measured in constant 1995 euro, its growth in annual percentage points. The slope of the regression lines gauges the strength of inequality-decreasing convergence forces. *Source: Eurostat.*

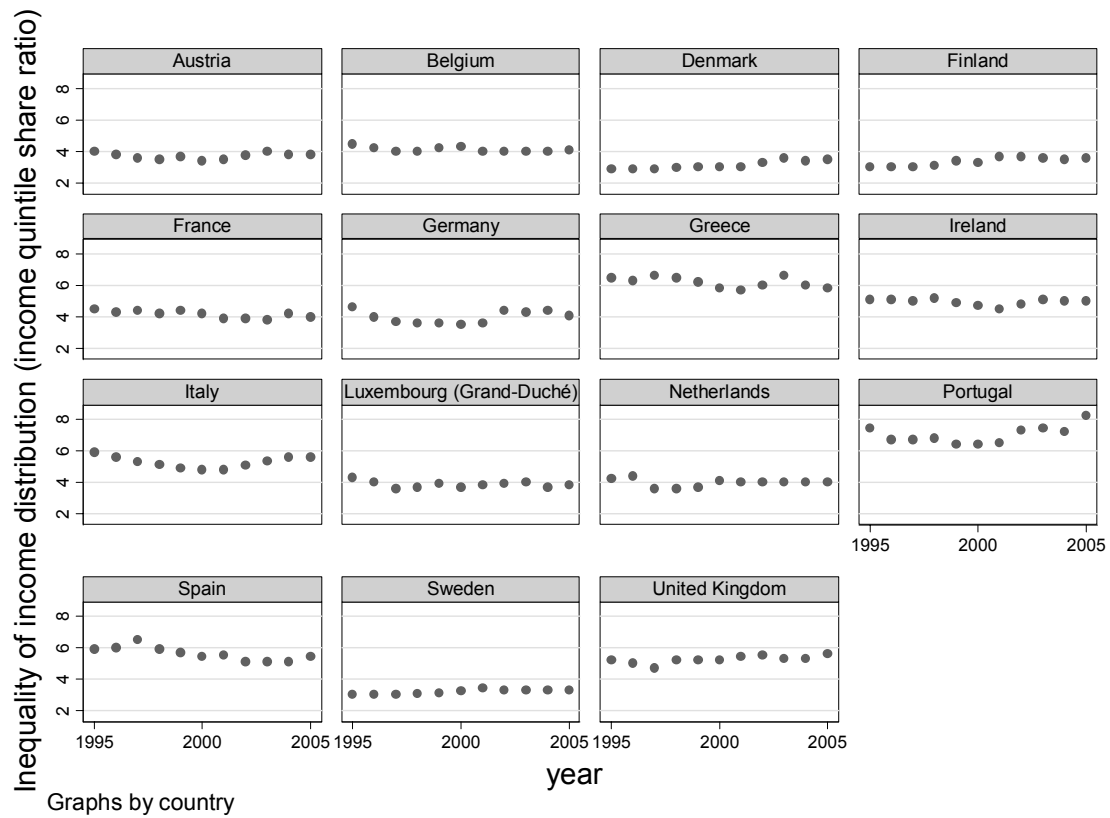


Figure 3 - Yearly 1995-2005 income quintile ratios for EU 15 countries. *Source: Eurostat.*

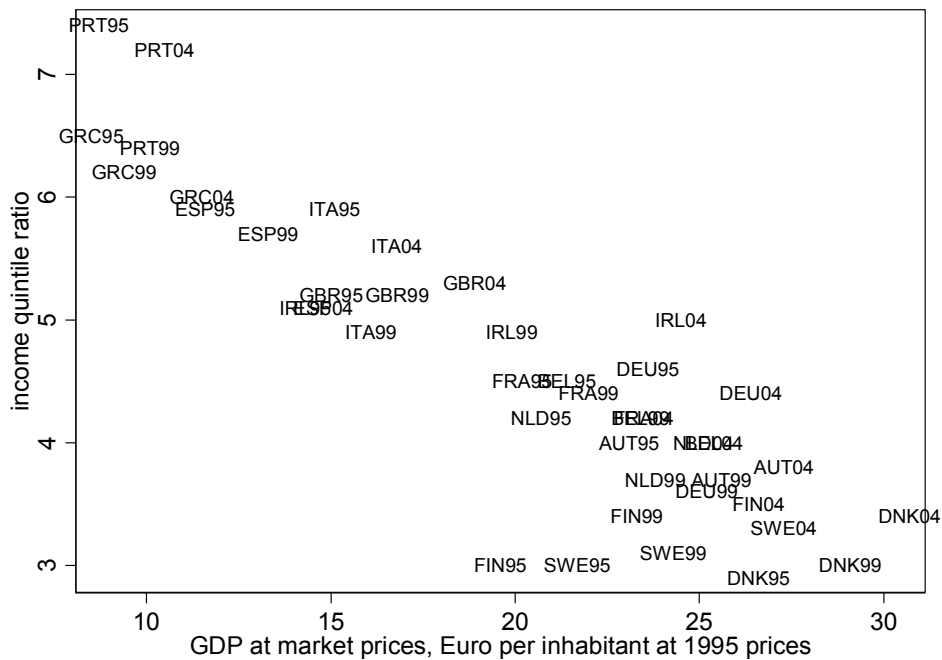


Figure 4 - Per capita GDP in constant 1995 euro and contemporaneous income quartile ratio; EU15 countries (except Luxembourg), 1995, 1999, 2004. *Source: Eurostat.*

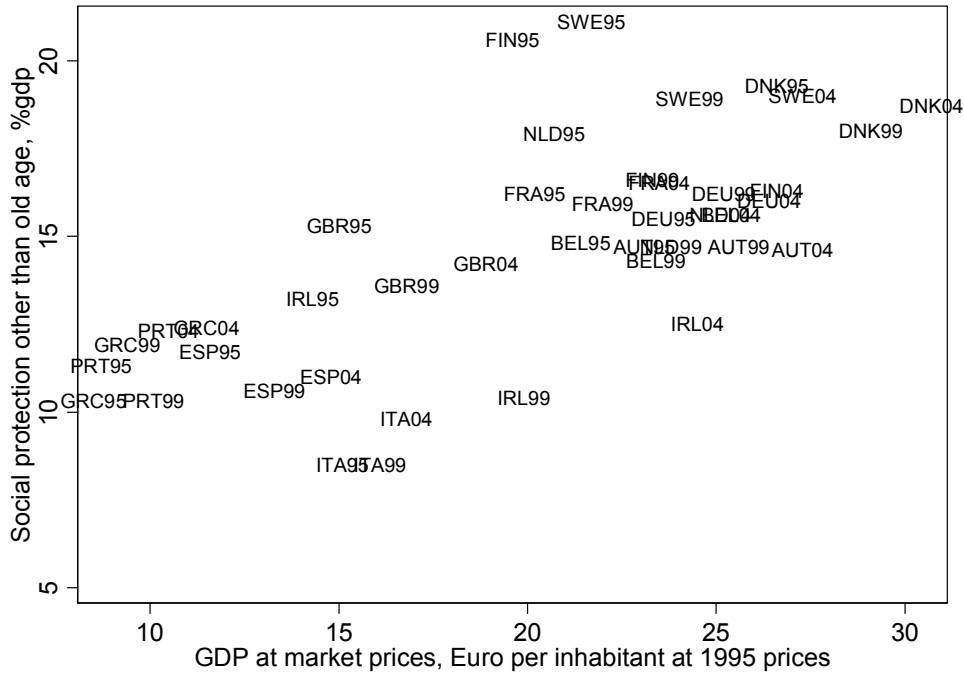


Figure 5 -Per capita GDP in constant 1995 euro and public social protection expenditure (ESSPROS definition, excluding old-age pensions) as a percentage of GDP; EU15 countries (except Luxembourg), 1995, 1999, 2004. *Source: Eurostat.*

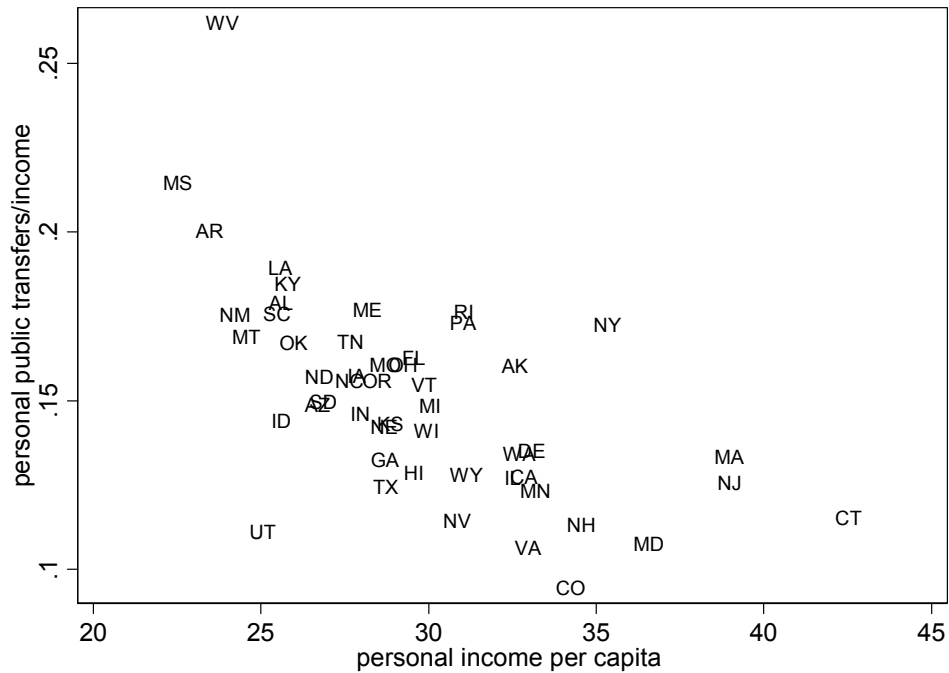


Figure 6 - Personal income in current dollars and Federal+State+local transfers to persons as a fraction of personal income; States of the US, 2002. *Source: Bureau of Economic Analysis*

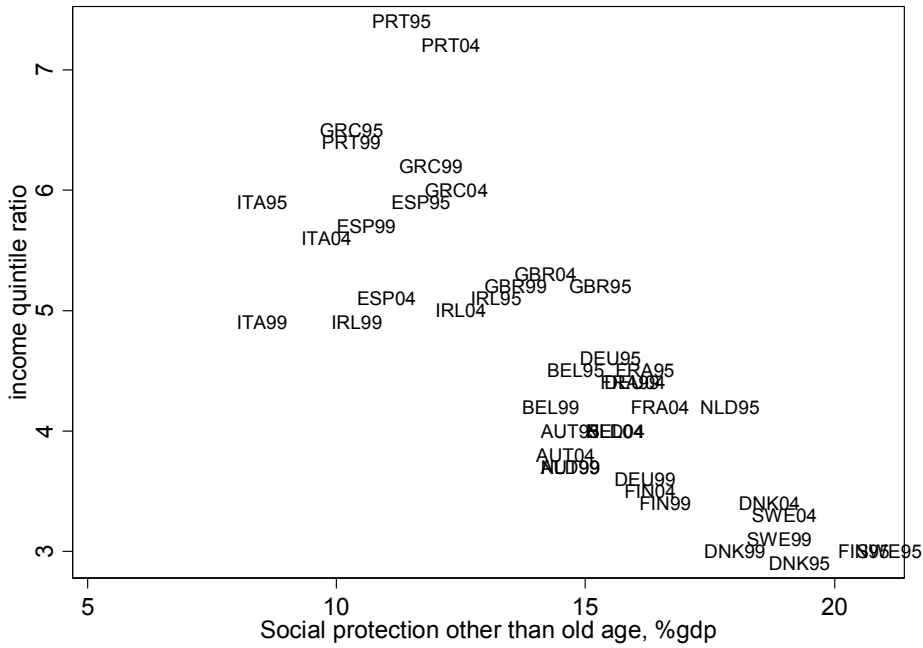


Figure 7 - Social protection expenditure (ESSPROS definition, excluding old-age and survivors pensions) as a percentage of GDP, and contemporaneous income quartile ratio in 1995, 1999, 2004. Source: Eurostat.

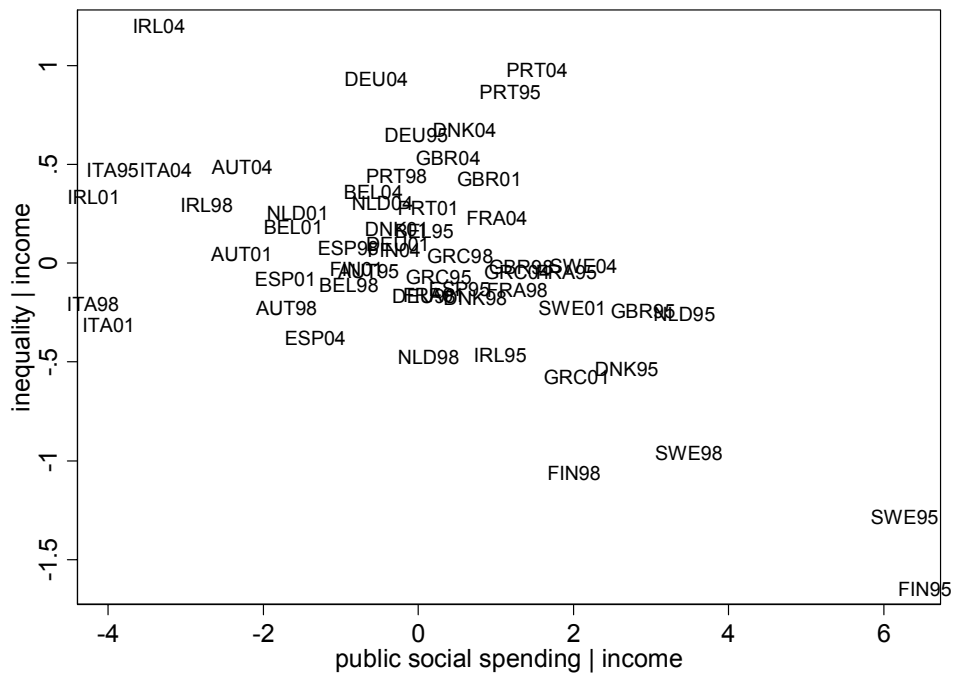


Figure 8 - Residuals from regressions of public social protection expenditure (as in Figures 5 and 7) and of income quintile ratios (as in Figures 4 and 6) on a constant and per capita GDP (as in Figures 4 and 5). The regression is run on 1995-2005 annual data, but only 1995, 1998, 2001, 2004 residuals are plotted to reduce clutter.

Table 1: Summary statistics.

	Mean	Std. Dev.	Min	Max
GDPp.c.	20.4	6.11	8.5	31.6
Unemp.	7.9	3.10	2.2	18.4
Ineq.	4.6	1.17	2.9	8.2
Pop.	27.0	26.01	3.6	82.5

Variable definitions:

GDPp.c.: GDP at market prices, Euro thousands per inhabitant at 1995 prices.

Unemp.: Harmonized unemployment rates, -/+ 25 years, yearly averages, in percentage points.

Ineq.: Inequality of income distribution, "income quintile share ratio: The ratio of total income received by the 20 % of the population with the highest income (top quintile) to that received by the 20 % of the population with the lowest income (lowest quintile). Income must be understood as equivalised disposable income."

Pop.: total population as of Jan 1st, millions.

Sample: 1995-2005 annual data for Austria, Belgium, Germany, Denmark, Spain, Finland, France, United Kingdom, Greece, Ireland, Italy, Netherlands, Portugal, Sweden.

Source: Eurostat.

Table 2: Growth, unemployment, integration and EMU.

	GDPp.c. (1)	Unemp. (2)	GDPp.c. (3)	Unemp. (4)	Economic integration		
					Goods (5)	Services (6)	FDI (7)
Pop.					-0.2197 <i>-2.43</i>	-0.1073 <i>-2.70</i>	-0.0334 <i>-2.06</i>
EMU	3.42 <i>4.88</i>	-2.44 <i>-4.16</i>	7.91 <i>4.73</i>	-1.10 <i>-2.07</i>	5.8866 <i>2.37</i>	2.8597 <i>1.95</i>	2.1582 <i>3.77</i>
EMU0	-6.35 <i>-1.80</i>	3.78 <i>3.30</i>			0.8685 <i>0.19</i>	-1.1574 <i>-0.87</i>	-2.5067 <i>-3.14</i>
Constant	23.72 <i>7.89</i>	6.07 <i>13.08</i>			31.8119 <i>12.55</i>	12.0258 <i>8.94</i>	6.2026 <i>9.91</i>
BEL			18.65	9.08			
DEU			20.33	9.15			
DNK			29.26	5.22			
ESP			8.49	13.77			
FIN			18.70	11.47			
FRA			17.13	10.77			
GBR			17.18	5.91			
GRC			6.35	10.83			
IRL			15.47	7.36			
ITA			11.19	10.50			
NLD			18.60	4.82			
PRT			4.93	6.57			
SWE			24.73	7.08			
N	154	154	154	154	147	147	133
r2	0.14	0.21	0.92	0.95	0.26	0.31	0.11

Robust t statistics are in italics below the slope coefficients (clustering of errors by country is accounted for in regressions without country fixed effects).

Variable definitions (in addition to those given in Table 1):

Economic integration, Goods: imports plus exports of goods in percent of GDP;

Economic integration, Services: imports plus exports of services in percent of GDP;

Economic integration, FDI: inward plus outward foreign direct investment flows in percent of GDP.

EMU0: dummy, equal to unity for Austria, Belgium, Germany, Spain, Finland, France, Greece, Ireland, Italy, Netherlands, Portugal.

EMU: dummy, equal to unity in 1999-2005 for Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherlands, Portugal, and in 2001-2005 for Greece.

The specification of columns (3) and (4) include a full set of country-specific dummies.

Sample: as in Table 1, except: no economic integration data for Belgium are available before 2000 (the results are very similar if all Belgium observations are omitted). Some other observations of FDI flows are also missing: Denmark in 2004, Greece in 1995-99 and 2002-05, and Sweden in 2000 and 2002.

Source: Eurostat.

Table 3: Inequality and EMU.

	Ineq. (1)	Ineq. (2)	Ineq. (3)	wage s. (4)	wage s. (5)	wage s. (6)	Ineq. (7)
Unemp.	-0.08 <i>-2.74</i>	-0.09 <i>-2.60</i>	0.09 <i>5.22</i>		-0.40 <i>-1.09</i>	-0.20 <i>-0.66</i>	-0.08 <i>-2.15</i>
Pop.	<0.01 <i>1.71</i>	<0.01 <i>1.91</i>	0.02 <i>0.50</i>		0.05 <i>1.29</i>	0.04 <i>1.37</i>	<0.01 <i>2.30</i>
GDPp.c.	-0.19 <i>-15.48</i>	-0.19 <i>-15.62</i>	0.13 <i>8.89</i>		0.66 <i>3.44</i>	0.59 <i>3.27</i>	-0.18 <i>-15.48</i>
wage s.							<0.01 <i>0.39</i>
EMU	0.28 <i>2.40</i>	0.20 <i>1.47</i>	-0.26 <i>-2.84</i>	-3.31 <i>-1.76</i>	-5.00 <i>-3.51</i>	-2.71 <i>-2.52</i>	0.14 <i>1.18</i>
EMU0		0.18 <i>0.79</i>				-4.80 <i>-1.82</i>	0.24 <i>0.89</i>
Intercept	Constant	Constant	Country effects	Constant	Constant	Constant	Constant
N	154	154	154	147	147	147	147
r2	0.85	0.85	0.99	0.07	0.60	0.66	0.84

Robust t statistics are in italics below the slope coefficients (clustering of errors by country is accounted for in regressions without country fixed effects).

Variable definitions (in addition to those given in Table 1 and Table 2):

Wage s.: Gross wages and salaries, percent of GDP.

Sample: as in Table 1, however Wage share is not available for Portugal between 1999 and 2005.

Source: Eurostat.

Table 4: Inequality, public social expenditure, and EMU.

	Ineq. (1)	Ineq. (2)	Ineq. (3)	Ineq. (4)
P.social exp.	-0.11 <i>-2.13</i>	-0.09 <i>-2.20</i>	-0.08 <i>-1.89</i>	-0.05 <i>-1.21</i>
GDPp.c.	-0.13 <i>-5.43</i>	-0.16 <i>-7.28</i>	-0.16 <i>-7.05</i>	0.08 <i>3.54</i>
Unemp.		-0.06 <i>-2.68</i>	-0.07 <i>-2.36</i>	0.07 <i>2.25</i>
Pop.		<0.01 <i>1.60</i>	<0.01 <i>1.73</i>	-0.10 <i>-1.67</i>
EMU	0.12 <i>0.94</i>	0.10 <i>0.96</i>	0.08 <i>0.71</i>	-0.17 <i>-2.00</i>
EMU0			0.05 <i>0.26</i>	2.94 <i>3.43</i>
Intercept	Constant	Constant	Constant	Country effects
N	140	140	140	140
r2	0.86	0.88	0.88	0.99

Robust t statistics in italics below the slope coefficients (clustering of errors by country is accounted for in regressions without country fixed effects).

Variable definitions (in addition to those given in Tables 1 and 2):

P.social exp.: Social protection expenditure, all ESSPROS classifications except “old age” and “survivors,” in percent of GDP.

Source: Eurostat.

Sample: as in Table 1, however social expenditure data are not available in 2005.

Table 5: Public social expenditure and EMU.

	P.social exp. (1)	P.social exp. (2)	P.social exp. (3)	P.social exp. (4)	P.social exp. (5)
GDPp.c.	0.37 <i>7.26</i>	0.34 <i>6.25</i>	0.40 <i>6.90</i>	0.37 <i>5.90</i>	0.18 <i>3.70</i>
Unemp.			0.15 <i>1.20</i>	0.24 <i>1.72</i>	0.56 <i>12.53</i>
pop			-0.01 <i>-0.72</i>	-0.01 <i>-0.85</i>	0.93 <i>6.08</i>
EMU	-1.94 <i>-3.52</i>	-1.29 <i>-2.41</i>	-1.78 <i>-3.31</i>	-0.77 <i>-1.73</i>	0.15 <i>0.84</i>
EMU0		-1.57 <i>-1.56</i>		-2.24 <i>-2.47</i>	
Intercept	Constant	Constant	Constant	Constant	Country effects
N	140	140	140	140	140
r2	0.61	0.64	0.63	0.68	0.99

Robust t statistics in italics below the slope coefficients (clustering of errors by country is accounted for in regressions without country fixed effects).

Variable definitions, sources, and sample: as in previous tables.