European Commission

ISSN 1725-3187

Fellowship initiative
The future of EMU

EUROPEAN ECONOMY

Economic Papers 490 | April 2013

Policy Coordination, Convergence, and the Rise and Crisis of EMU Imbalances

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Economic and Financial Affairs

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KC-AI-13-490-EN-N
ISBN 978-92-79-28572-1
doi: 10.2765/42965

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Directorate-General for Economic and Financial Affairs

Policy Coordination, Convergence, and the Rise and Crisis of EMU Imbalances

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Abstract

If economic integration fosters expectations of institutional and productivity convergence, then international capital flows should be driven by consumption-smoothing anticipation of future income growth patterns as well as by factor-intensity equalization. In the euro area, financial market integration eased accumulation of international imbalances but does not appear to have resulted in the expected institutional convergence. The resulting crisis casts doubt on the sustainability not only of international imbalances, but also of the current configuration of the European integration process. A robust and coherent European market and policy integration process would require supranational implementation of the behavioral constraints and contingent redistribution schemes that traditionally operate within National socio-economic systems, and have been weakened in recent experience by uncoordinated policy competition.

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ACKNOWLEDGEMENTS

This Economic Paper is published as part of DG ECFIN's Fellowship Initiative 2012-13.

The initiative was coordinated by a steering group comprising of Anne Bucher, Ines Drumond, Karl Pichelmann, Eric Ruscher and Michael Thiel.

Helpful comments and suggestions by Alfonso Arpaia, Narcissa Balta, Nicolas Carnot, Carlos Cuerpo Caballero, Stefan Ciobanu, Francesca D'Auria, Ombeline Gras, Isabel Grilo, Alexandr Hobza, Anton Jevcak, Robert Kuenzel, Staffan Linden, Alienor Margerit, Kieran McMorrow, Silvia Merler, Josefa Monteagudo, Plamen Nikolov, Peter Pontuch, Werner Roeger, Georges Tournemire, Geza Sapi, Hylke Vandenbussche and Stefan Zeugner are gratefully acknowledged, as is the very efficient administrative support provided by Filomena de Assis, Agnieszka Budzinska, Mariyana Ivanova, Nancy Saba and Kristine de Winter.

1. Introduction

One might view the euro area crisis as the consequence of credit mistakenly granted to borrowers who did not mean to repay their debts. Maybe borrowers were aided and abetted in fooling lenders by financial intermediaries who disguised dubious loans as safe assets, or maybe both borrowers and lenders counted on taxpayer third parties to fill the gap between promised and actual repayment. If such deception is the cause of unsustainable debt accumulation, its consequences are easily characterized in terms of short-run macroeconomic mechanisms, whereby opportunities to borrow at low interest rates boost domestic aggregate demand in debtor countries. This view has fairly obvious policy implications. Debtors should not be bailed out, but be punished severely; the macroeconomic consequences of financial excesses should be preemptively detected and corrected not only by enforcing public debt and deficit limits, but also by keeping under control international financial imbalances and competitiveness indicators, as envisioned by the Macroeconomic Imbalances Procedure laid out in EU Regulations 1174/2011 and 1176/2011.

This paper explores the empirical fit and deeper policy implications of a less conspiratorial and longer-run perspective on the sources and implications of the rise of international imbalances. The inter-temporal approach to current account dynamics suggests that observed international financial imbalances incorporate market participants' best forecast of future developments (Obstfeld and Rogoff, 1995). Just like optimal consumption and saving behavior reveals expectations about future labor income growth for individuals (Campbell and Deaton, 1989), so international capital flows provide information about countries' expected total factor productivity growth (Aguiar and Gopinath, 2007). During the euro's first decade, the consensual financial transactions eased by adoption of the single currency were plausibly driven not only by capital flows towards initially capital-poor countries, but also by expectations that tighter market integration would accelerate the institutional and productivity convergence promised by the European integration process. Financial imbalances that take the form of non-contingent debt can become unsustainable if realizations diverge from expectations. From this perspective, the euro area crisis is rooted in the weakness or absence of the expected cross-country convergence, in the asymmetric implications of the global economic and financial crisis, and in the inability or unwillingness on the part of markets and governments to share the resulting unforeseen losses.

If the crisis reveals less obvious mistakes than those highlighted by the simpler views outlined above, it should be analyzed in the context of broader structural vulnerabilities of EU markets and public policies, and has less obvious and more difficult policy implications. The European Union can achieve its growth, cohesion, and stability objectives only in the context of a coherent system of National and supranational policies (Sapir et al, 2004). A dynamic perspective on the rise and crisis of euro area imbalances relates that experience to deeper problematic features of the European economic and monetary integration experiment. To prevent the problems made clear by the euro area debt crisis, a sustainable policy framework should on the one hand foster institutional and productivity convergence, on the other feature orderly risk-sharing and redistribution mechanisms in the face of unexpected shocks. While politically legitimate behavioral constraints and tax-and-transfer schemes fulfill such roles within traditional Nations, the 2000s international imbalances trajectory highlights key shortcomings in these respects of the European Union's policy framework. International imbalance accumulation was rational from the point of view of market participants and National policymakers, but was inadequately supported by policy-shaping and risk-sharing institutional mechanisms. Such hitherto missing features of the European policy framework might have avoided the current crisis, but revised perceptions of economic integration's promises and pitfalls may self-fulfilling trigger a breakdown of the integration process itself.

The rest of the paper develops this argument using simple theoretical insights and empirical observations. Section 2 outlines how economic integration influences the distribution and dynamics of income within and across countries, through both factor reallocation and international policy competition, and characterizes the international financial imbalances arising both from investment by residents of capital-abundant countries in capital-poor countries' domestic production, and from prospects of productivity convergence in relatively backward countries. After reviewing earlier empirical evidence on regional and international convergence, Section 3 inspects the data generated by the European monetary integration experience. Before the crisis, total factor productivity growth accounted for a substantial portion of observed convergence patterns across other EU member countries but not within the euro area, where deteriorating productivity was accompanied by worsening institutional quality indicators and declining inequality in increasingly indebted countries. As the convergence expectations that could plausibly justify imbalance accumulation were not realized within the euro area, the recent crisis can be interpreted in terms of the imbalance sustainability problems resulting from revision of those expectations, as well as from

asymmetric shocks. Section 4 offers such an interpretation, and highlights the role in this context of weak and unclear contingent loss-sharing provision. During the crisis, financial valuation effects do not appear to have reacted systematically and appropriately to international income shocks. In sharp contrast to the role performed across US States by taxes and transfers, the absence of contingent risk-sharing instruments across EU member countries implied disorderly adjustment and divergent disposable income developments. Section 5 outlines how the EU-level and country-specific policy frameworks may in theory prevent recent problems from arising again in the future, and Section 6 concludes summarizing the implications of the paper's theoretical arguments and empirical findings for the desirable but difficult evolution of the European integration process.

2. Integration implications

This section outlines how the total size, distribution, and dynamics of production and incomes respond to market integration, which shapes cross-border reorganization of production as well as country-specific institutions and policies.

2.1 Production efficiency and income distribution

Since previous patterns of production and consumption remain feasible when markets cross the boundaries of previously separated economies, economic integration is generally expected to increase aggregate income. Box 1 illustrates this general insight in the simplest possible formal way, showing that international mobility of some (but not all) production factors across countries that use similar technologies with initially different factor intensities improves overall efficiency, implies convergence of production levels, and changes the relative unit income of factors within each economy.

The size of the three effects can be illustrated quantitatively on the context of the Box 1's simple analytical framework. Suppose a country's per capita production is 50% lower than that of a similar (in terms of immobile-factor stocks, or population) country. If all of that difference were due to factor intensity, an income share of the mobile factor equal to 1/3 would require a more than four-fold increase of the stock of the mobile factor employed in the lower-income country, where its unit income should decrease by about 65% and he unit income of the immobile factor increase by a similar percentage. In the richer country, the unit income of the mobile factor should increase by some 45%, and that of the immobile factor should decrease by about 18%. Such sizable factor flows and income changes would imply large differences

between domestic production and income, but only increase the integrated economy's total production by about 10%.

These computations illustrate simply more general insights as to the extent to which market integration may improve economic efficiency, and as to its distributional implication. [1] Rather than through factor mobility, economic integration can influence income through trade in goods and services, or intermediate inputs, which are produced with different factor bundles. In such a setting, the elasticity of real income to the inverse of the share of domestic production in domestic expenditure is shown to Arkolakis, Costinot, and Rodríguez-Clare (2012) between 1/5th and 1/10th, so that when removal of trade barriers increases imports and exports by 10 percentage points of an economy's production, its real income increases by only 1 or 2 percentage points.

As international factor mobility or domestic factor reallocation both bid down the income of factors that were scarcer in autarky than in the integrated economy, they change income distribution across individuals who own different factors in different proportions within each country. The derivations in Box 1 establish that while economic integration certainly benefits the "representative" individuals who earn income from mobile and immobile factors in each country's autarkic proportions, it can reduce the income of individuals who disproportionally own factors that are less scarce in the integrated economy than in autarky. The same international market barriers that reduce the income of hypothetical country-specific representative individuals, they do protect the incomes of many real-life individuals. For this reason, as discussed by e.g. Bean et al (1997), removing them is not easy. Redistributing the gains from trade would in principle make it possible to let all individuals benefit from economic integration. In practice, however, it is hard to do so, because gains and losses occur through mechanisms less obvious than those driven by factor income and wealth distribution patterns. [2] Economic integration generally benefits owners of factors that can exploit new

[1] Sapir (2011) thoroughly reviews the literature on economic integration in the European context, and on many of the policy issues analyzed here. Economies of scale can foster intra-industry trade as each country specializes in differentiated products, and can influence aggregate growth and local agglomeration patterns. While increasing returns to scale can lead to divergence and justify regional corrective policies, convergence expectations appear more relevant to the imbalance accumulation experience of interest in this paper.

[2] When more than two factors are used in production, economic integration can exploit complementarity as well as substitution possibilities (Feenstra and Hanson, 2001). If for example countries differ not only in terms not only of capital availability but also of the mix of skilled and unskilled labour, then integration makes it possible for a poor country's skilled labour to work with the

opportunities, and damages owners of factors that become exposed to international competition, and the channels through which such effects occur can be difficult to disentangle from other income determinants. By making it easier for all Europeans to spend their vacation on Mediterranean rather Baltic coasts, for example, the single tourism market increases the relative price of Mediterranean vacations, and the income of the beaches and workers that produce them. Those relative prices and incomes, however, are also influenced by business choices, market developments, and technological and organizational progress in the travel industry. So it would be hard precisely to determine the impact of removal of trade barriers and harmonization of technical specification implied by the European Union's Single Market policy measures, or by the clearer and more stable price comparisons afforded by adoption of a single currency.

While in reality it can be difficult to predict the effects of economic integration on personal income inequality, the distributional implications of the simple international capital mobility framework in Box 1 are clear if wealth realistically more unequally distributed than other sources of income. Economic integration should increase inequality in capital-rich countries, where wealthier individuals can enjoy the higher rate of return offered by investment in capital-poor countries; symmetrically, inequality should decline in countries where capital inflow bid down returns on wealth and increase the marginal productivity of the immobile factors they complement in production.

Box 1: Factor intensity equalization and income distribution

Consider two countries that in autarky produce output flows $k^{\alpha}(na)^{1-\alpha}$ and $K^{\alpha}(NA)^{1-\alpha}$ using amounts k and K of a potentially mobile factor ("capital"), n and N of an immobile factor ("labor"); a and A index the overall productivities productivity. If capital can move, its marginal productivity should be equalized at $\alpha((K+k)/(AN+an))^{\alpha-1}$, so $m = ANan(K/(AN) - k/(an))/(AN+an)$ units should move across borders. Domestic production levels converge, with a decline in the initially capital-rich country. Income levels converge by less, as net international factor income payments are negative for the

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rich country's complementary capital rather than with substitutable unskilled labour, to imply wider wage differentials across skill levels.

country with initially lower capital intensity and domestic production. To see that aggregate income increases in both countries, consider its change in one country from $k^{\alpha}(na)^{1-\alpha}$ to $(1-\alpha)(k/(na))^{\alpha}x^{\alpha}na+\alpha(k/(na))^{\alpha-1}x^{\alpha-1}$ where $x=((k+K)/(an+AN))/(k/(an))$, the ratio of the integrated economy's and the country's factor intensity, may be larger than or smaller than unity; since $(1-\alpha)(x)^{\alpha}+\alpha(x)^{\alpha-1}>1$ for all $x\neq 1$ economic integration increases aggregate income in any case, and in each country. However, economic integration may increase or decrease the individual income generated by n_i units of the immobile factor and k_i units of the newly mobile factor, which depends on the factor intensity variation x according to $an_i(1-\alpha)(k/(an))^{\alpha}x^{-\alpha}+k_i\alpha(k/(an))^{\alpha-1}x^{1-\alpha}$ and, if $n_i/k_i\neq n/k$, may be lower at $x\neq 1$.

2.2 Policy competition

Economic integration has ambiguous direct effects on income inequality and instability. Depending on the relationship between factor price changes and factor ownership patterns, factor income equalization may as discussed above increase or decrease personal income inequality within each country; and as removal of international market barriers opens the way to new shocks as well as to new adjustment channels, it may amplify or reduce income fluctuations over time. Less ambiguously, however, internationalization of markets also reduces the efficacy of national policies meant to reduce the inequality and volatility of incomes, because the broader freedom of choice afforded by goods and factor mobility makes it easier for private agents not only to pursue more efficient allocation, but also to escape policy prescriptions.

A large literature shows that when economically integrated entities independently choose tax and spending policies, then it is more difficult for each to pursue collective objectives. This general tax competition insight can be made more precise and qualified in a variety of interesting ways (Wilson, 1999; Keen and Konrad, 2012). Not only should tax burdens tend to fall on immobile factors, but also the tax policy of relatively small countries should be more responsive to economic integration, because their tax base is more elastic than that of countries which comprise a large fraction of the integrated economy. Box 2 illustrates these

insights with a simple formal model where policy choices, like economic integration, influence effective factor use and unit factor incomes. The deregulation pressure exerted by policy competition may be welcome when it affects policies that benefit small powerful groups at a large cost in terms of aggregate production efficiency, or that have become obsolete in light of new circumstances (such as demographic and technological trends or private insurance market development) that call for less generous and pervasive redistribution and regulation. But it is unpopular when it affects policies that benefits large segments of society and aim at goals that markets are poorly equipped to pursue. While competition among individuals in well-regulated markets fosters efficiency, competition among policymakers replicates across systems the market failures that collective policies are meant to correct (Sinn, 1997).

Local production and market infrastructure should not be subject to race-to-the-bottom tensions, and aspects of regulation that enhance productivity should also be more attractive for competing systems. To the extent that a social welfare safety net may encourage entrepreneurial innovation, and job security may similarly encourage risk-taking behavior by employees, neither should be pressured by international competition. Policies that pursue other objectives at a cost in terms of production efficiency, conversely, are harder to implement and enforce when markets cross the boundaries of policy-making constituencies. This is particularly relevant for redistribution policies, which can be motivated by solidarity towards one's neighbors or by the unpleasant implications of extreme poverty within reach of one's property, but also provides security over each individual's lifetime. Labor income is the most important resource for most people and, since it cannot be easily diversified in financial markets, collective action often aims at increasing its size and reducing its inequality. Such policies and institutions can improve imperfect market outcomes if they exploit better information than is available to market participants on the probability distribution of shocks, and the implications of individually optimal behavior. Within a given set of markets, collective policymakers have obvious informational advantages on public goods and externalities, and can correct coordination failures also when sticky prices and wages would imply inefficient fluctuations. Their informational advantage is smaller for observation of the effort choices that, along with random shocks, determine individual income. Hence, the same policies that smooth incomes across individuals and over time also generally decrease effort, employment, and aggregate income.

Factor and product market integration strengthens the negative implications of such efficiency losses. Redistribution policies have stronger side effects when tax bases react very elastically

to taxation, transfers may be paid to members of other jurisdictions (either directly through immigration, or indirectly through product and labor market interactions), and production activities can be relocated in order to escape regulation of working conditions and wages. In the absence of coordinated collective action spanning the scope of relevant market interactions, theory predicts that policy choices should tend to privilege production efficiency over other objectives. This tendency may be stronger when adoption of a single currency removes devaluation escape routes to temporarily better competitiveness, but may be weaker if competitiveness losses can be easily financed by international imbalances.

Box 2: Factor income redistribution and economic integration

Consider how individual incomes, which depend on factor ownership and unit factor payments, may be determined by country-specific institutions and policies as well as by economic integration. As in Box 1, let unit market income correspond to their marginal productivities $\alpha(k/(anl))^{\alpha-1}$ for "capital" and $(1-\alpha)al(k/(anl))^{\alpha}$ for the other factor, n. The latter, which in Box 1 was characterized by its international immobility, here is only partly made available for market production, and may in both respects be interpreted as "labor". If its employment amounts to nl, and differs from the available aggregate amount n, and non-market use yields an income-equivalent flow b, then the income of an individual who owns k_i and n_i is

$$\alpha(k/(anl))^{\alpha-1}k_i + ((1-\alpha)al(k/(anl))^{\alpha} + (1-l)b)n_i = (k)^{\alpha}(anl)^{1-\alpha}(\alpha(k_i/k) + (1-\alpha)(n_i/n)) + (1-l)bn_i$$

and the first order condition for maximization with respect to l is $(1-\alpha)(k/(anl))^{\alpha} a\omega_i = b$ where $\omega_i = 1-(1-(k_i/k)/(n_i/n))\alpha$ captures the role of factor income sources. For the "representative" individual who owns the two factors in the aggregate proportions, $\omega_i = 1$, and welfare is maximized when the marginal productivity of the immobile factor to its opportunity cost b. Individuals with $k_i/k < n_i/n$ instead benefit from collective policies that decrease l below that competitive equilibrium level, and equate that factor's marginal product to b/ω_i for $\omega_i < 1$. In the case of labor, this outcome can be achieved by binding minimum wages and/or by payroll taxes that finance non-employment subsidies. Distributional motives may also be relevant for country-specific factors other than labor, which may benefit from market power and other economically inefficient product market distortions.

To see how policies motivated by such distributional concerns are influenced by the economic integration represented as in Box 1 by capital mobility, denote with $k(l,L)$ and $K(l,L)$ the stocks of capital used in each of two policymaking entities. These depend on the immobile factor amounts employed in each of the two locations, because the total amount available κ of capital should be allocated so as to equalize its marginal productivity. Under constant returns, unit factor incomes depend on effective capital intensity, to imply that $k(l,L) = nl\kappa/(nl+NL)$. For l to maximize an expression that represents distributional concerns with $\omega_i \neq 1$ it should satisfy a first order condition in the form $(1-\alpha(anl)/(anl+ANL))(\kappa/(anl+ANL))^{\alpha} a\omega_i = b$. Economic integration influences this optimality condition, and the policies that implement it, both through the level effect of capital intensity, and because capital mobility increases the employment elasticity of production. The latter effect reduces the markup implied by the policy problem's solution, bringing it close to the competitive outcome when $anl/(anl+ANL)$ is small. Policy competition across economically integrated countries implies higher production and less attention to other policy objectives than what would be implied by each country's choices in autarky at the same capital intensity, and by the first order condition $(1-\alpha)(\kappa/(anl+ANL))^{\alpha} a\omega = b$ of a joint maximization problem where both l and L are chosen and enforced at the integrated economy's level.

2.3 Convergence

Across closed economies, decreasing returns to investment and savings imply production convergence towards possibly country-specific steady states (Barro and Sala-i-Martin, 1992). When non-zero current accounts allow investment to differ from savings, capital flows tend to equalize marginal productivity and rates of returns and imply stronger convergence, as domestic investment declines in capital-abundant countries and increases in countries that are farther from exhausting returns to capital accumulation. Across economies that are fully financially integrated, capital mobility should immediately and completely equalize returns to accumulation and mobile factor incomes, to imply equally immediate and complete convergence of production levels across countries using similar technologies. Financial market imperfections can slow down convergence: if only a portion of each country's capital can serve as collateral for international financial transactions, for example, income convergence is a prerequisite for return equalization, and occurs slowly over time (Barro, Mankiw, and Sala-i-

Martin, 1995). Even when integration implies complete convergence of factor marginal productivity, per capita income or consumption of course remain different across individuals who own different bundles of factors. Moreover, economic integration only implies factor price equalization across economies that use identical technologies, but the unit income of immobile factors depends on the environment in which they are employed: just as land in arid mountains is different from land in fertile plains, so labor income depends on each country's organizational and legal institutions.

Production efficiency can explain why income differs vastly across imperfectly integrated countries at a point in time, and can contribute to its convergence over time. Technological knowledge need not be uniform across geographically and culturally distant locations, and may diffuse more readily across those that are connected by market and institutional channels. In models where firms may adopt techniques previously introduced by "frontier" innovators anywhere within an area where knowledge can be shared, economic integration makes it possible to select the best technologies from a wider set and may speed up aggregate growth (Rivera-Batiz and Romer, 1991) at a rate which reflects decreasing returns to imitation (Barro and Sala-i-Martin, 1997) and can be influenced by taxes, subsidies, and other institutional features that influence the cost of technology adoption (Parente and Prescott, 1994).

For this paper's purposes, it is useful to entertain the possibility that international integration may also lead to convergence of the institutional and organizational features that determine not only practical adoption of abstract technological knowledge but also, as in Box 2, taxes, regulations, market structure, and other more or less observable distribution-motivated factor-use distortion. Production dynamics within an integrated economic area then reflects not only factor accumulation or reallocation in technologically similar economies, but also gradual international assimilation of technological and institutional features. Under the simple assumption of a constant rate of convergence of country-specific productivity, which may in less succinct models reflect institutional as well as technological features, Box 3 shows that such a process implies equally steady convergence over time of immobile factors' unit incomes within an integrated market where factor mobility (or trade) imply more immediate equalization across countries of other factor incomes.

Box 3: Productivity convergence

Suppose that a portion of per capita production across the countries modeled in Box 1 reflects different absolute productivities. Unit capital incomes are immediately equalized upon integration, and afterwards remain determined by the integrated economy's capital intensity. After integration, in the country denoted with lower-case letters the immobile factor's marginal productivity increases from $a(1-\alpha)(k/(an))^{\alpha}$ to $a(1-\alpha)((k+K)/(an+AN))^{\alpha}$, and differs from that of the other country's if $a \neq A$. Such absolute productivity differences may partly depend on policy-induced factor use distortions as in Box 2, but for simplicity this will not be made explicit here. If productivity converges across countries over time, immobile factor incomes in the country denoted by lower-case symbols amount to $a(t)n(1-\alpha)((k+K)/(a(t)n+AN))^{\alpha}$ at time t, and grow over time if that country is initially less productive. If this process eliminates a constant fraction per unit time of the difference between $a(t)$ and a limit value a_{∞}, which may differ from A because of permanent geographical or cultural features, then $a(t) = a_{\infty}(1-e^{-\nu t}) + a(0)e^{-\nu t}$.

2.4 Financial imbalances

Factor-price equalization may not be immediate, both because labor mobility and capital accumulation entail adjustment costs and because capital flows may be slowed down by cross-border financial market imperfections. A slow evolution is also plausible for the technological and institutional features represented by aggregate productivity parameters in Box 3. Hence, both may explain slow convergence of GDP per capita, but their implications are different for the character of financial imbalances and for the dynamics of income and expenditure. If productivity differs across countries and converges slowly, then the unit incomes of immobile factors and individual consumption levels are not equalized by economic integration. In integrated financial markets, however, the growth rate of consumption should not depend strongly on incomes. As expectations of increasing productivity are capitalized in consumption levels, this implies international financial imbalances that have interestingly different sources and implications from those implied by "downhill" capital flows.

In general, expectations of productivity convergence make it optimal for owners of immobile factors in relatively backward countries to anticipate in their consumption the higher income promised by productivity growth. This consumption-smoothing mechanism can be characterized easily if the growth rate of consumption is constant across individuals who can

borrow and lend from each other, which is the case if their preferences are identical and isoelastic or, even more simply, if in the integrated economy the utility discount and return rates are equal to each other, so that optimal consumption is constant. The analytical derivations in Box 4 show that in such a setting the aggregate consumption of a country that expects upwards productivity convergence exceeds its national income by a sizable fraction of the immobile factor's income share. Should for example productivity be expected to eventually increase by 100%, rates of convergence and discount of 2% and 3% would imply a current account in the order of some 25% of income if the immobile factor income share is 2/3. More conservative parameters imply smaller optimal borrowing in the formula derived in Box 4, but even a fast convergence rate of 10% per year and a small immobile-factor income share of 50% would imply an initial external deficit in excess of 10% of income.

The "downhill" capital flows that equalize rates of return do not need to be reversed, as their accumulated stock is serviced by the returns to investment. In a stationary economy, the current account remains balanced as factor income payments correspond exactly to the trade-balance excess of domestic production over domestic consumption. More generally, as productivity (or employment) varies over time capital should continue to flow towards countries where its factor intensity would otherwise decline, and imbalances to be funded at marginal productivity rates.

Imbalances resulting from consumption smoothing and expectations of convergence, conversely, do need to be repaid. The derivations in Box 4 indicate that the difference between consumption and income change sign after a time and at imbalance levels that, while necessarily finite, are quite long and large for plausible parameter values. For example, if productivity is expected to eventually double, a 3% yearly real rate of return implies that consumption-smoothing debt begins to fall more than 25 years after the start of a convergence process at a rate of 2% (and almost 15 years at a 10% convergence rate), and at the peak debt is more than 200% of the country's production if the immobile factor income share is 2/3.

Box 4: Consumption-smoothing imbalances

Consistently with the external imbalance interpretation given to factor mobility, suppose that the same factor that is geographically mobile can be accumulated. Disregarding for notational simplicity both capital depreciation and growth of the integrated economy, consider a steady

state where the return to capital $\alpha\left((K+k)/(AN+an)\right)^{\alpha-1}$ equals the utility discount rate, ρ. In a country that at some time 0 begins to experience the productivity convergence process outlined in Box 3, consumption is optimally constant at the level that satisfies the budget constraint,

$$c(0) = \alpha\left(\frac{K+k}{AN+an}\right)^{\alpha-1} k(0) + \rho n(1-\alpha)\left(\frac{K+k}{AN+an}\right)^{\alpha} \int_0^{\infty} \left(a_{\infty}\left(1-e^{-\nu t}\right) + a(0)e^{-\nu t}\right)e^{-\rho t}dt$$
$$= \alpha\left(\frac{K+k}{AN+an}\right)^{\alpha-1} k + n(1-\alpha)\left(\frac{K+k}{AN+an}\right)^{\alpha}\left(\frac{\nu a_{\infty} + \rho a(0)}{\nu+\rho}\right).$$

The first term in the consumption expression corresponds to capital income, the second to the permanent income of the immobile factor which, under exponential convergence, is a weighted average of its initial and asymptotic levels, and exceeds the current level if $\nu > 0$ and $a_{\infty} > a(0)$.

The country's consumption initially exceeds its national income by a fraction $(a_{\infty} - a(0))\nu/(a(0)/(\nu+\rho))$ of immobile factor income, which is in turn a fraction $(1-\alpha)$ of aggregate production. The international liabilities incurred for such consumption-smoothing purposes evolve according to

$$b(t) = n(1-\alpha)\left(\frac{K+k}{AN+an}\right)^{\alpha}(a_{\infty} - a(0))\frac{e^{-\rho t} - e^{-(\nu+\rho)t}}{\nu+\rho}$$

and peak $T = \left(\ln(\nu+\rho) - \ln(\rho)\right)/\nu$ years after integration, when they amount to

$$b(T) = n(1-\alpha)\left(\frac{K+k}{AN+an}\right)^{\alpha}(a_{\infty} - a(0))\frac{\nu}{(\nu+\rho)^2}\left(\frac{\rho}{\nu+\rho}\right)^{\rho/\nu}$$
$$= (1-\alpha)\left(\frac{a_{\infty} - a(0)}{\nu a_{\infty} + \rho a(0)}\right)\frac{\nu}{\nu+\rho}\left(\frac{\rho}{\nu+\rho}\right)^{\rho/\nu}\left[n\frac{\nu a_{\infty} + \rho a(0)}{\nu+\rho}\left(\frac{K+k}{AN+an}\right)^{\alpha}\right]$$

where the expression in square brackets corresponds to domestic production.

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3. Before the crisis

The theory outlined above suggests that imbalances across integrating countries may be driven not only by factor reallocation (with efficiency and distributional implications) but also by expectations of productivity convergence (driven by policy adaptation as well as by diffusion of technological and cultural best practices). This section reviews, updates, and extends previous studies of the relationship between economic integration, international imbalances, and income dynamics and distribution within the EU and the euro area, and assesses the extent to

which the imbalances patterns observed in a situation of increasingly tight economic and financial integration was associated in the data with income, production, and productivity convergence, as well as with the inequality developments implied in theory by the relative factor income and policy competition implications of market integration.

3.1 Convergence of production, productivity, and institutions

The European integration process is mainly focused on removal of barriers to international market competition, but the production efficiency gains outlined in Box 1 are not large enough to motivate it. The Cecchini (1988) estimates of the Single Market Program's production impact, in the 2-6 percentage points range, are a significant but non-essential byproduct of a process that, in the tragic aftermath of World War Two, deployed economic instruments in order to pursue essentially cultural and political objectives. In the European integration context, market unification is a means to the end of fostering convergence not only of economic production methods, but also of institutions, cultures, and policies that, with or without explicit coordination and political agreement, could be expected to become increasingly similar across Nations that, faced by similar problems and interacting in common markets, would select better policies among those adopted by fellow member states. From this point of view, adoption of a single currency is a step towards full integration of market interactions, rather than as a factor of macroeconomic policy credibility and stability. Like removal of barriers to trade and factor mobility, elimination of currency risk improves price transparency, reduces the extent to which price and wage stickiness may blur relative productivity signals, and supports broader and deeper integration of markets for goods, services, and financial products.

The convergence and policy competition mechanisms outlined in Sections 2.1 and 2.2 could then plausibly be stronger across the area countries than across less tightly integrated European Union member countries. Elimination of currency risk, however, is also a crucial necessary condition for financial market integration (Jappelli and Pagano, 2010), and this makes Section 2.3's perspective on international financial imbalances especially relevant to the euro area experience. Capital flows and productivity dynamics can both lead to convergence of production, income, and consumption, and either or both may do so more strongly within more tightly integrated economies.

As market forces quickly equalize mobile factors' marginal productivities within a uniform market environment, only cultural, institutional, and technological dynamics can account for

longer-run convergence across fully integrated geographical locations. The simple computations reported in Section 2 indicate that the financial imbalance implications of such convergence are very large over a wide range of possible convergence rates. At the time of the euro area's inception, however, expected convergence rates were not easy to estimate on past data. As income level and growth patterns are generally driven by imperfectly observable phenomena and disturbed by sizable shocks, spurious forces can easily dominate the rather slow average convergence rate economic agents may expect in light of long-run historical experiences.

A potentially suitable gauge of convergence forces within fully economically and politically integrated areas may be obtained from regional data. Some 2% per year of relative income differences across regions appears to be eliminated within completely integrated nations according to the data and methods of Barro and Sala-i-Martin (1992, for US States) and Sala-i-Martin (1996, also for regions of Japan, Germany, the UK, France, Italy, Spain, and Canada); but productivity failed to convergence across Eastern and Western Germany after the country's unification (Burda and Hunt, 2001), and the European regional data analyzed by Boldrin and Canova (2001) were essentially silent as to the speed and character of convergence, whether spontaneous or influenced by regional policies. Empirical studies of regional convergence cannot be very informative, because plausible determinants of income dynamics are not always observable at regional level. De La Fuente (2002) uses Spanish regional data to estimate technological convergence parameters between 2.7% and 6.6% per year when convergence is assumed to be complete in the long run, and up to 22% per year when regional fixed effects are allowed to represent unexplained permanent income differences. Fixed-effects regression estimates may however be biased by measurement and specification errors, since determinants of steady state production and productivity are unlikely to be accurately measured in available data, or constant over time and unrelated to growth realizations.

Convergence rate estimates are also much larger when allowing for fixed effects in country-level regressions (Caselli, Esquivel, and Lefort, 1996), and the vast cross-country convergence literature reviewed by De La Fuente (1997) and Islam (2003) could also offer some imprecise indications as to the speed of convergence to be expected in the European integration context. That literature, however, was motivated by models of endogenous (to factor accumulation) growth. Treating country trajectories as unrelated realizations of a common data generating process, it aimed at interpreting convergence estimates as indicators of returns to accumulation in closed economies, but its methods cannot shed light on that issue if the

knowledge spillovers that prevent exhaustion of returns to capital accumulation are not restrained by the borders of culturally integrated countries. Productivity convergence is an obviously realistic component of observed cross-county income dynamics when it is disturbed by business-cycle shocks (den Haan, 1995), and may plausibly be faster in the early aftermath of regime changes such as those implied by international economic integration.

When savings and investment do not balance across countries linked by integrated financial markets and common institutions, domestic production convergence patterns are driven by international capital, technology, and policy connections rather than by country-specific decreasing returns to accumulation. The implications of this more complex data generation process for consumption and income convergence implications have not been as widely studied as those of production convergence across essentially closed economies. Verdier (2008) explores the empirical fit of the Barro, Mankiw, and Sala-i-Martin (1995) model of financial market imperfections, using external debt data, however, and the evidence on savings, investment, and current accounts in Europe (Blanchard and Giavazzi, 2002, and other references in Jappelli and Pagano, 2010) is of course relevant to assessment of interactions between economic integration and various convergence notions.

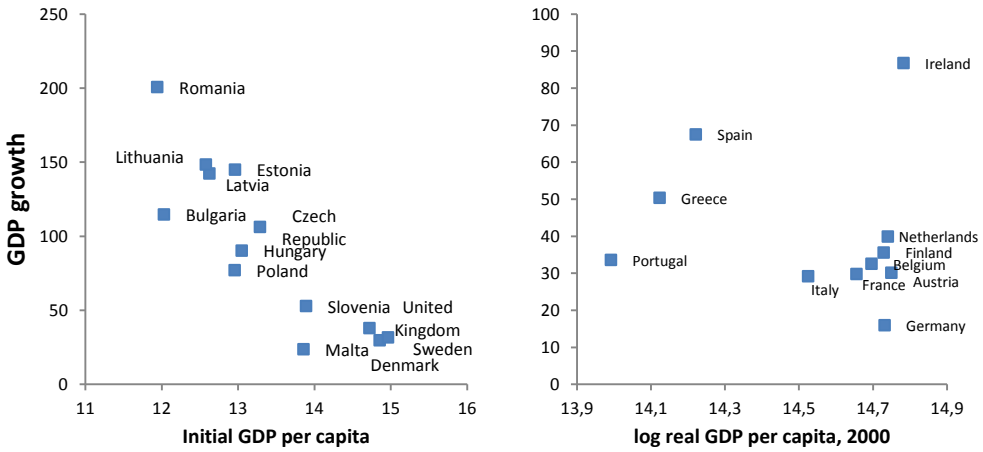

Figure 1. Domestic production convergence across non-euro area and euro area members of the EU27, 2000-2007. Initial GDP is measured as the log volume per capita in 2000 (2001 for Greece; source: Eurostat); GDP growth refers to the 2000-2007 period (2001-2007 for Greece; source: Eurostat).

While convergence estimates may be imprecise in general, pre-crisis European experience did feature significant production convergence. As shown in Figure 1, 2000-2007 domestic production growth was systematically faster in countries with relatively low initial per capita

income across the EU27. The message conveyed by this figure, like those of the following similarly illustrative pictures, does not much depend on the period considered. It will however prove informative to inspect the relevant relationships separately across the groups of European Union member countries that did or did not adopt the single currency at the beginning of the decade.

The growth rate of domestic production was very negatively and tightly related to initial income levels in the EU27 as a whole, where most Central and Eastern European new member countries grew very fast: the slope coefficient estimated in the left-hand panel of Figure 1 indicates that about half of initial proportional income gaps are erased on average in seven years, to imply a converge rate of about 15% per year. Little convergence was instead observed in the cross-section of euro area countries, where Irish and Portuguese data do not conform with convergence predictions and, on average, only a little more than 1% per year of income gaps was disappearing. This does not necessarily falsify convergence expectations, because the number of observations and the variation of initial income levels are small in the euro area sample, and the imprecisely estimated slope coefficient is not significantly different from values that imply substantial convergence.

The dynamics of domestic production levels may result from international factor reallocation, from changes of factor utilization within each country (possibly as a result of policy reforms), or from different productivity growth dynamics. The third source of production convergence is of particular interest, because it explains international financial imbalances in terms of consumption-smoothing rather than factor-intensity-equalizing mechanisms. Figure 2 shows that in 2000-2007 total factor productivity growth was generally faster in initially poorer countries within the EU27, but developed very differently inside and outside the euro area.

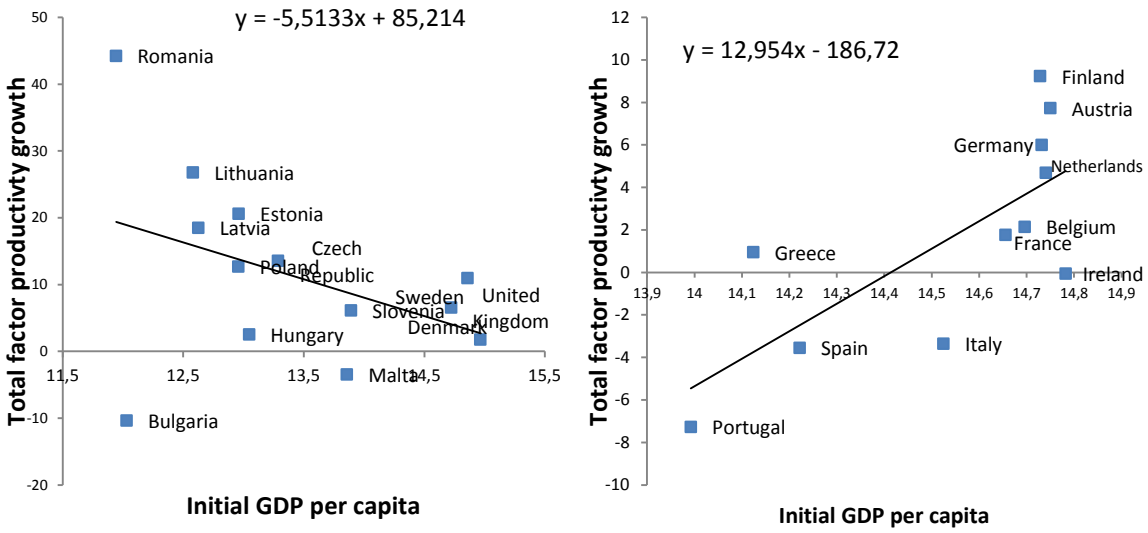

Figure 2. Total factor productivity growth and initial income across non-euro area and euro area members of the EU27, 2000-2007. Initial GDP is measured as the log volume per capita in 2000 (2001 for Greece; source: Eurostat). Total factor productivity growth, measured as percent log difference, refers to the 2000-2007 period (source: Conference Board).

Across the non-euro area members of the EU27 in the left-hand side panel of Figure 2, the regression coefficient implies convergence of productivity at about 1.5% per year. This accounts for a significant, if not very large, proportion of the production convergence detected in Figure 1, of which about 9/10ths turns out to be explained by different speeds of capital accumulation and other factors' growth. Within the group of countries that joined the euro area at its inception, productivity growth is positive and unrelated to initial per capita GDP across the group of Northern countries that withstood the crisis well, but negative and inversely related to initial GDP per capita in Ireland, Italy, Spain, and Portugal.

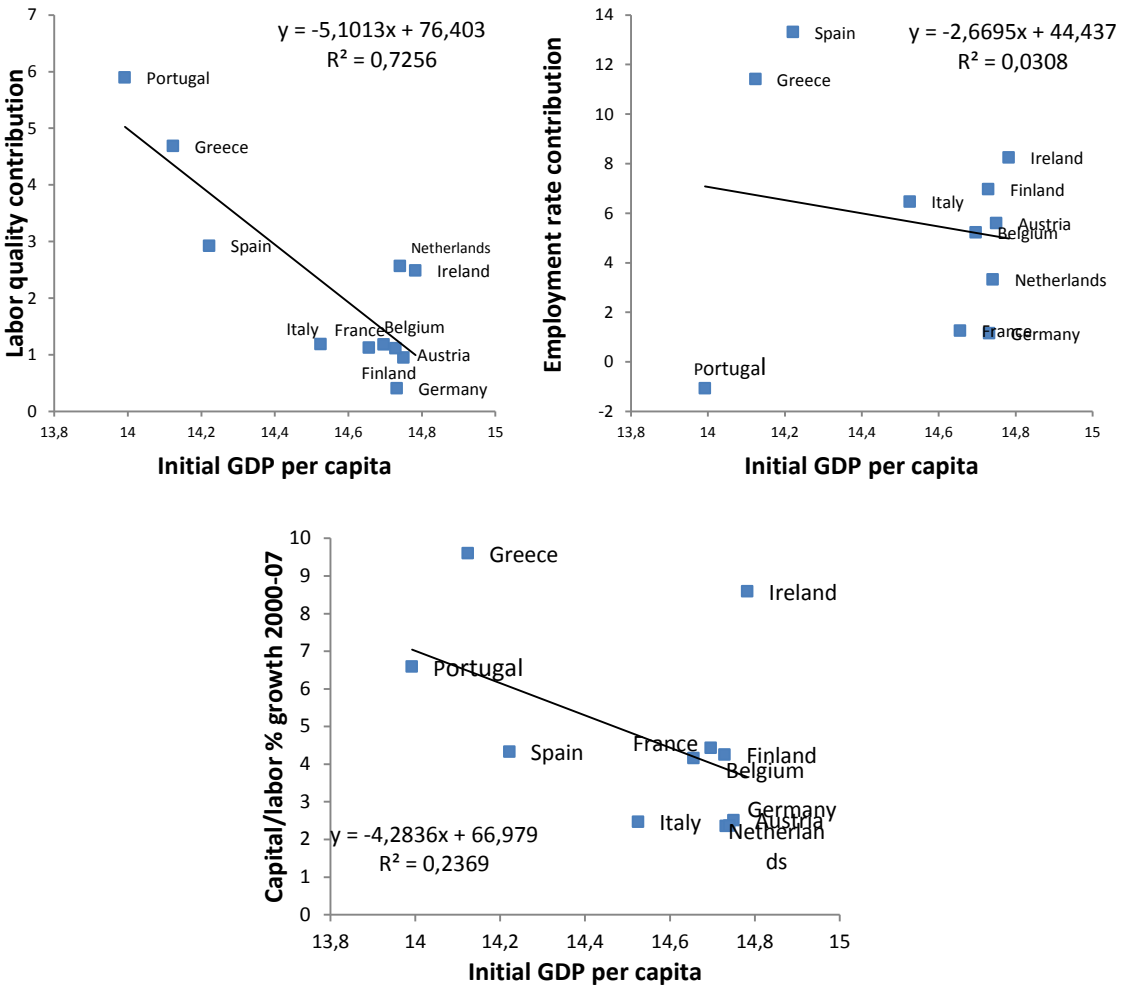

Figure 3. Growth and convergence in the euro area: contribution of factors other than total productivity. Contributions to per capita GDP growth, measured as percent log difference, refer to the 2000-2007 period (source: Conference Board). Initial GDP is measured as log volume per capita in 2000 (2001 for Greece; source: Eurostat).

Thus, absolute productivity differences explain an increasingly large portion of the diminishing income differentials observed in the euro area. As shown in Figure 3, the dynamics of labor's quality did imply strong convergence across the euro area. A milder tendency for production to grow faster in initially poorer countries was due to labor quantity, which did not increase in relatively poor Portugal, and by stronger "capital deepening" investment, which was also strong in relatively rich Ireland.

If income differentials only depended on technological knowledge, it would be very hard to understand why productivity growth could be slower in initially low-income countries. While the core European countries had by the 1990s exhausted their catch-up opportunities in the post-War Golden Age, and found it difficult to grow because its institutional structure is not

conducive to frontier advancement (Sapir et al, 2004), sizable catch-up opportunities remained to be exploited for relatively peripheral countries in the 2000s. Europe as a whole could still improve the efficiency of its factor allocation and, more generally, of its production structure.

Before the crisis, opportunities to do so were still taken up in the Central and Eastern European countries displayed in the left-hand panel of Figure 2, but the right-hand panel of the same figure makes it clear that production growth was not driven by productivity developments in peripheral euro area countries (similar evidence is uncovered and discussed by Giavazzi and Spaventa, 2010, and their European Commission and European Central Bank references).

In these countries, economic activity was influenced by the aggregate demand impact of the low interest rates and capital inflow implications of euro adoption, which eased their financial integration more strongly than that of other European Union member countries. It is not easy to see how this could imply that the evidence displayed in the right-hand panel of Figure 2 is spuriously driven by biased factor productivity estimates. While those estimates rely on the potentially problematic assumption that factors are compensated according to their marginal productivity, slow wage adjustment would typically imply that labor's marginal productivity exceeds its current compensation along the upward swing of macroeconomic cycles, and that measured total factor productivity growth is more positive than true technological progress. Thus, it is all the more remarkable to observe negative estimated productivity growth in countries that, before the crisis, were experiencing strong aggregate demand growth, declining unemployment, and growing employment of more educated workers.[3]

The theory outlined in Section 2 suggests that measured total factor productivity reflects not only purely technical efficiency, but also policies and institutions that, for a variety of distributional purposes, distort factor employment away from production efficiency. The legal and physical infrastructure that supports property rights and market competition certainly accounts for important portion of international productivity variation, and is determined in turn by collective choices shaped by distributional concerns as well as by the efficiency considerations that would maximize by a hypothetical representative individual. Rather than by implausible regress of the technological know-how that total factor productivity estimates

[3] Total factor productivity estimates may also suffer from difficult aggregation and measurement problems in the presence of large reallocation into the production and distribution services sectors, and of the significant labor quality changed implied by immigration and educational achievement progress. The direction of the resulting biases is ambiguous.

would measure in perfectly competitive markets, actual measured productivity growth can be influenced by changing distributional concerns. These, and the policy instruments available to address them in more or less distortive ways, differ across countries for historical reasons. Countries, however, are not condemned by history (Rodrik et al., 2004): their institutions and policies can and do evolve over time, in ways that may plausibly be related to the international integration forces at work within Europe and at the global level. There may be "no established theory of convergence or divergence of government policies across countries and regions" (Barro and Sala-i-Martin, 1997), but Europe's historic economic integration experiment did mean to foster processes that could dismantle some of the institutional factors that (as in Parente and Prescott, 1994) perpetuate income differentials. Adoption of the acquis communautaire establishes a common and sensible legal and policy framework, and elimination of market barriers allows external competition to counter any rent-seeking tendencies in National policymaking processes. Thus, it could be hoped that imitation would trigger convergence not only through technological knowledge flows but also, and more importantly, through adoption of institutional features that support efficient use of resources.

Much as it could be hoped that productivity would converge as a result of tighter economic integration, this did not happen in the euro area, and it is interesting to seek in institutional developments the reasons why growth expectations were not realized. As a rough gauge of such developments, Figure 4 uses changes of the sum of the six World Bank Worldwide Governance Indicators.[4] The relationship it displays between that measure of institutional quality and the Conference Board's estimate of total factor productivity growth is remarkably tight for measures constructed by independent organizations with complex and unrelated data collection and processing procedures. Growing (or declining) total factor productivity was indeed broadly associated with improving (or deteriorating) institutional quality in 2000-2007 across European Union countries.

[4] The indicators, downloadable and documented at http://www.govindicators.org, aggregate and normalize by cross-sectional standard deviations a large number of underlying indicators (drawn from individual opinions surveys and a variety of reports by private and public information providers) for six subject areas. The evidence uncovered here of a relationship between their changes and total factor productivity growth extends and updates studies of their relationship to production levels and growth rates in International Monetary Fund (2003) and European Commission (2004). Hall and Jones (1999) included a similar average of "government anti-diversion policies" indicators as an explanatory variable in productivity level-accounting regressions.

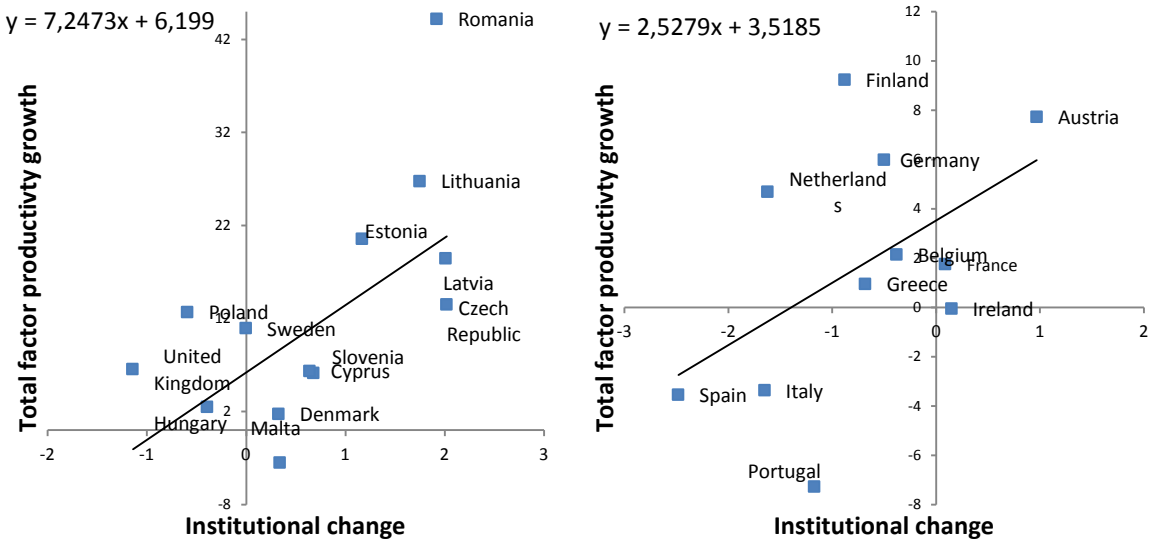

Figure 4. Relationship between changes of institutional quality and total factor productivity in non-euro area and euro area members of the EU27, 2000-2007. Institutional change is measured as the difference between 2000 and 2007 of the sum of the six institutional quality indicators compiled in the World Governance Indicators database (source: World Bank). Total factor productivity growth is measured as percent log difference over the same he 2000-2007 period (source: Conference Board).

The overall pattern of this suggestive relationship is more interesting and reliable than specific noisy observations. It would be moot, for example, to try and explain why Finland's and Portugal's productivity growth differs so dramatically for similar declines in institutional quality. The association between economic productivity and institutional quality developments, however, is strong over other periods and country samples. While it is difficult to disentangle precisely the relationship between total factor productivity and specific dimensions of institutional quality, which are likely to be measured even less precisely than the average displayed in Figure 4, the poor productivity performances of some euro area countries with negative international imbalances are very intriguingly associated with sharp declines of the World Bank's assessment of their institutional quality.

As Figure 5 shows, the remarkable co-variation of the two independently measured aspects especially strong in Greece, Italy, Portugal, and Spain. In these countries, total factor productivity and institutional quality both decline in lockstep, the latter as a result of disparate changes of the various measured institutional dimensions. In data not shown here, the relationship was similarly strong in the Central and Easter European accession countries where both increase over the period when data are available. Just like Central and Eastern European

countries improved their institutions recently, so the 1980s accession countries that are currently troubled by the crisis might have experienced convergent dynamics before the late 1990s, when the WGI institutional quality data (compiled only every 2 years from 1996 to 2000) become available.

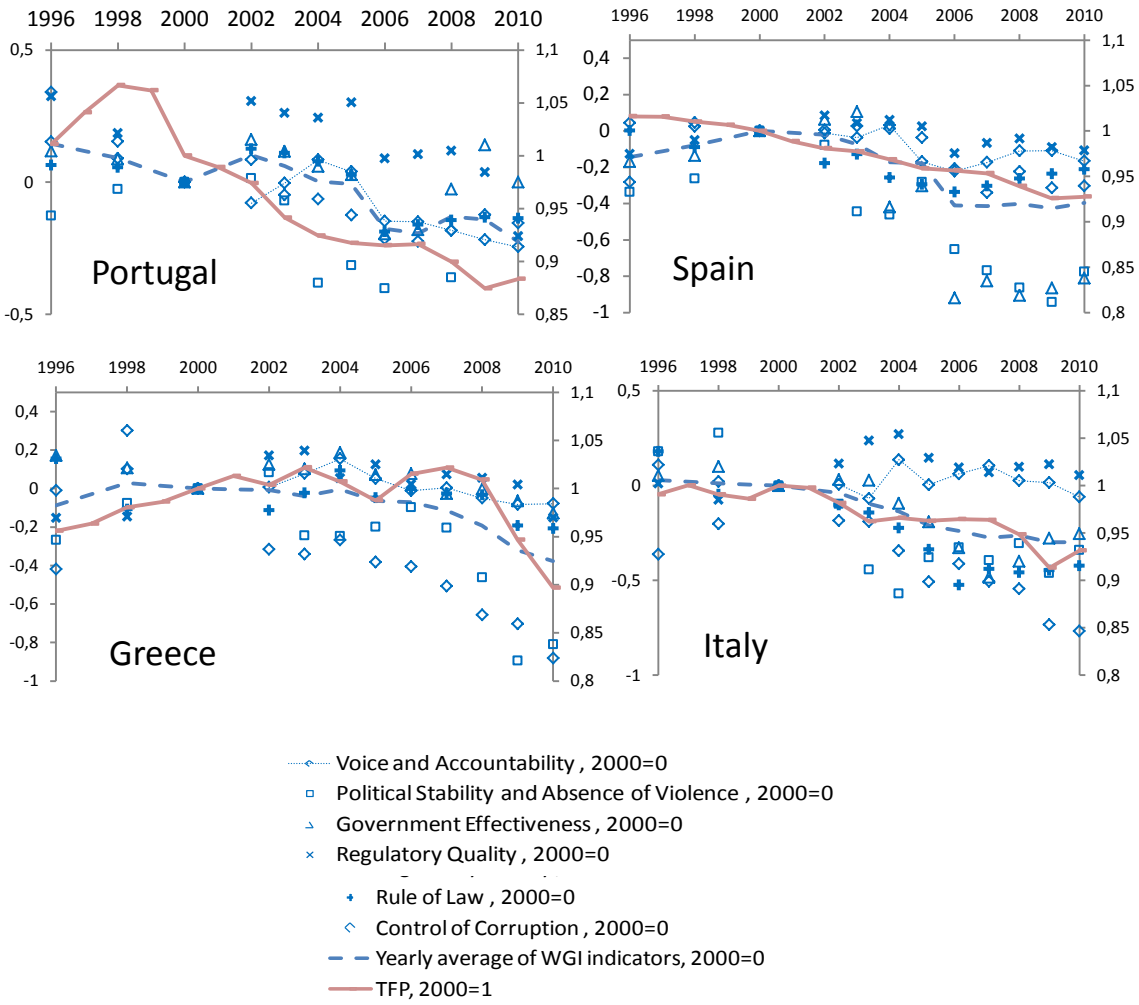

Figure 5. Time path of institutional quality indicators and total factor productivity in Greece, Italy, Portual, Spain. For every year when data are available and each of the four countries, symbols plot the difference from the 2000 value of the six institutional quality indicators compiled in the World Governance Indicators database (source: World Bank).

Since Figure 4 establishes a significant relationship between measured productivity growth and changes of institutional quality, and ever tighter integration was supposed to foster convergence of both, it is natural to wonder whether that particular institutional quality measure did converge across European countries. Figure 6 indicates that over the 2000-2007 pre-crisis period this was the case across the EU27: even thought the institutional quality measure displays no convergence or divergence over the full sample, EU accession by Central and Eastern European new Member States does appear to imply strong convergence in the left-hand panel of Figure 6. Across early adopters of the euro, conversely, Institutional quality indicators actually diverge slightly in the right-hand panel. [5] By implication of the relationship illustrated in Figure 4, the same was true of productivity levels.

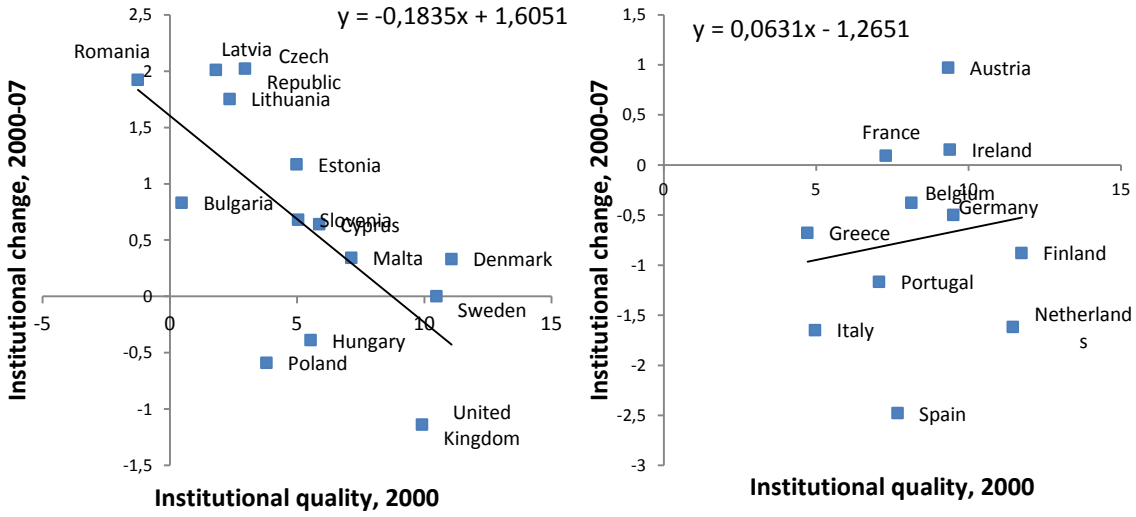

Figure 6. Convergence of institutional quality in non-euro area and euro area members of the EU27, 2000-2007. Change over 2000-2007 and level in 2000 of the sum of the six institutional quality indicators (source: World Governance Indicators database, World Bank).

While there is no doubt that adoption of the single currency deepened financial market integration among euro area member countries, productivity growth patterns may also have been influenced within that group by other similarly timed factors. Eastern enlargement of the European Union plausibly strengthened reform pressure in Germany and other neighboring countries, and diverted some foreign direct investment away from peripheral Western member counties. Any direct effects of monetary unification may also have been confounded

[5] Most of these countries display declining institutional quality: however, the data are cross-sectionally normalized in each year at the global level, so this only indicates that institutions were not improving in the euro area as fast as in the world.

by globalization trends.[6] Regardless of whether these or other processes drove part of the productivity dynamics, the evidence displayed in the figures indicates that those dynamics did not foster convergence within the euro area, as already observed by Giavazzi and Spaventa (2010) and others. And it also suggests that this problematic development was related to institutional convergence processes that, while still at work in other European countries, ceased in the pre-crisis euro area group of financially integrated countries.

3.2 International imbalances

While monetary union was not ex post associated with faster institutional and productivity convergence, it certainly eased accumulation of international imbalances within a more tightly integrated financial market. As discussed in Section 2, to the extent that efficiency gains were expected for relatively backward member countries, financial integration would make it natural for imbalances to grow. Figure 7 shows that more negative net international asset accumulation in 1998-2003 was indeed associated with stronger domestic production growth in 2003-07. This can be consistent with the theoretical relationships implied by both factor-intensity-equalizing and consumption-smoothing flows, each of which should be negatively related across countries with expected (and, until 2007, realized) domestic production growth.

[6] The data analyzed by Chen, Milesi Ferretti, and Tressel (2012) detect a correlation between patterns of trade with China and current account changes within the euro area.

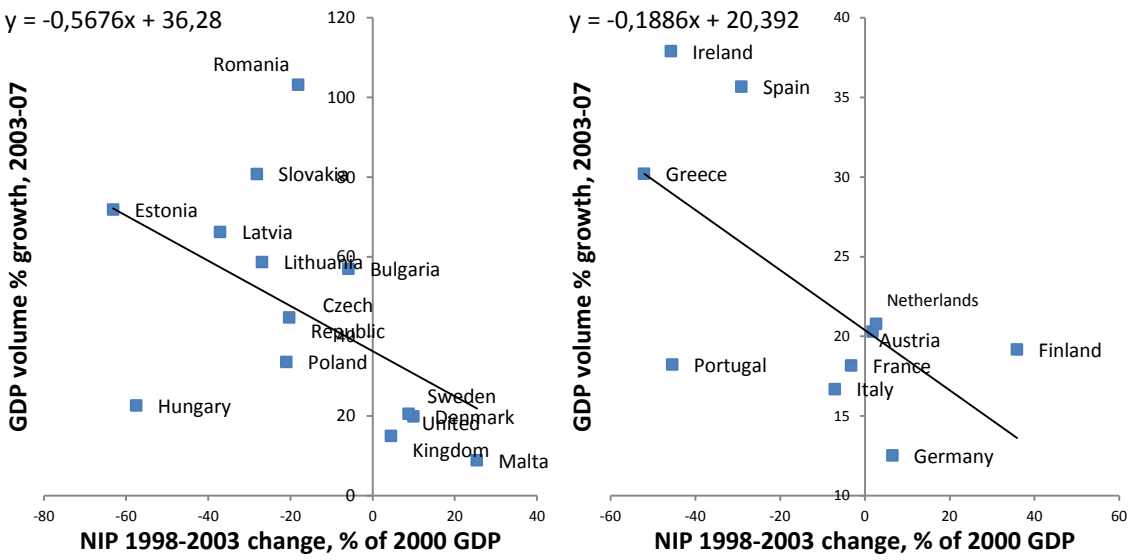

Figure 7. International imbalance accumulation and subsequent domestic production growth in non-euro area and euro area members of the EU27, 2000-2007. GDP growth in 2003-2007 and international assets change over the 1998-2003 period, measured as the variation of the Net International Position normalized by the 2000 nominal GDP (source: Eurostat).

Capital intensity is not directly observable in the absence of reliable and internationally comparable capital stock estimates. It can be approximated by initial per capita production if the latter's other determinants (such as employment rates and technological parameters) are sufficiently similar across countries, to imply that (as long as factor reallocation is not instantaneous) convergence should be driven by different investment rates. The Single Program and Economic and Monetary Union did result in such "downhill" capital flows running from capital-rich to otherwise similar capital-poor countries (Blanchard and Giavazzi, 2002). Inasmuch as the European *acquis communautaire* and adoption of the single currency relaxed the financial constraints implied by e.g. imperfect access to international collateral as in Barro, Mankiw, and Sala-i-Martin (1995), this convergence process should have been fast throughout the European Union, and particularly so in the euro area.

More prolonged and delicate convergence and imbalances are implied by the evolution of the structural factors summarized by "disembodied" or "total" factor productivity. While there are good reasons for capital not to move to poor countries when their poverty is due to inferior technology or institutions rather than to capital scarcity, international imbalances should be driven not only by the better investment returns offered by relatively capital-poor countries,

but also by inter-temporal consumption smoothing when relatively backward countries can be expected to develop as a consequence of *acquis communautaire* adoption and market integration. Within fully integrated financial markets, consumption levels should not converge slowly. Residents of countries where productivity is expected to grow faster should anticipate future income growth in their consumption, and save less so as to align the across borders their consumption's dynamic profile. This perspective offers a structural interpretation for the often voiced "over-optimism" view of intra-euro area imbalances. Very large external imbalances can be consistent with relatively weak capital accumulation when they are supported by expectations of productivity-driven growth. It might have been plausible to expect monetary unification to accelerate productivity convergence across the euro area, but no relevant precedent existed for that experiment. With hindsight, adoption of a single currency (but not of a common policy framework in many other policy areas) should not have been expected to foster convergence of productivity-relevant institutions, but it certainly did foster financial market integration.

Many aspects of various countries' experiences, including most of the Macroeconomic Imbalance Procedure indicators, are plausible manifestations of the inter-temporal profiles implied by expectations of slow upward productivity convergence. It has been abundantly documented that growing imbalances across EU member countries were mirrored by changes in relative unit labor costs. From the proposed dynamic perspective on current account imbalances, such losses of competitiveness are driven by the same expectations that rationalize imbalances. One may view wage moderation in Germany as a consequence of difficult labor market conditions in the aftermath of reunification and of labor market reforms. The proximate cause of strong wage growth in Spain may well be the strength of insider unions, and large increases of the number and pay of Greek public employees may be explained by political consensus-seeking motives. At a deeper level, however, these and other determinants of relative inflation and competitiveness patterns may be related to the same productivity convergence patterns that explain international imbalances. Between 1998 and 2007, Germany was growing slowly, and ageing faster than any other EU country (and indeed than any country worldwide except Japan). This and other observable relative demographic factors may well explain why Germany consumed much less than its slowly-growing production, and to invest its savings looked beyond domestic investment opportunities concentrated in traditional "old economy" sectors at a time when financial services and new technologies appeared to offer more attractive.

Expectations of income growth and unrestricted international borrowing imply stronger demand for non-traded goods (such as distribution services and housing), draw production factors out of the tradable sector, bid up wages, reduce exports and increase imports. Just like natural resource windfalls lead to "Dutch Disease" loss of competitiveness, a country expecting fast productivity growth may just run up external debt rather than pay for imports with natural resource revenues. The theory and evidence discussed so far characterized the relationship between income dynamics and imbalances in real terms, measuring consumption and production units in terms of a single unit, and drew implications for financial imbalances from the assumption that some factors, and some technological or institutional features, are tied to specific locations within integrated markets. In reality, some production is also immobile. If consumption anticipates prospects of increasing productivity, stronger demand for such non-traded components of consumption baskets should increase their price as long as their supply is not perfectly elastic. Housing did become pricier in countries where private consumption grew faster (Figure 8), and international imbalances became more negative. Not only housing and retail distribution, but also police, and other services are predominantly consumed by local residents. To the extent that public expenditure increases more than proportionally to the standard of living, the same growth expectations that justify higher consumption can imply a tendency to provide more generous welfare benefits, and better public services. While the former effect appears hard to disentangle in available data from that of international policy competition, the data indicate that the growth of government consumption's volume and prices are both related to consumption changes, and to lower (more negative) international imbalances Like international imbalances, these and other price and wage inflation differentials may all be implications of the better standard of living, willingly financed by international investors, that relatively backward countries can afford when integration promises income and productivity growth.

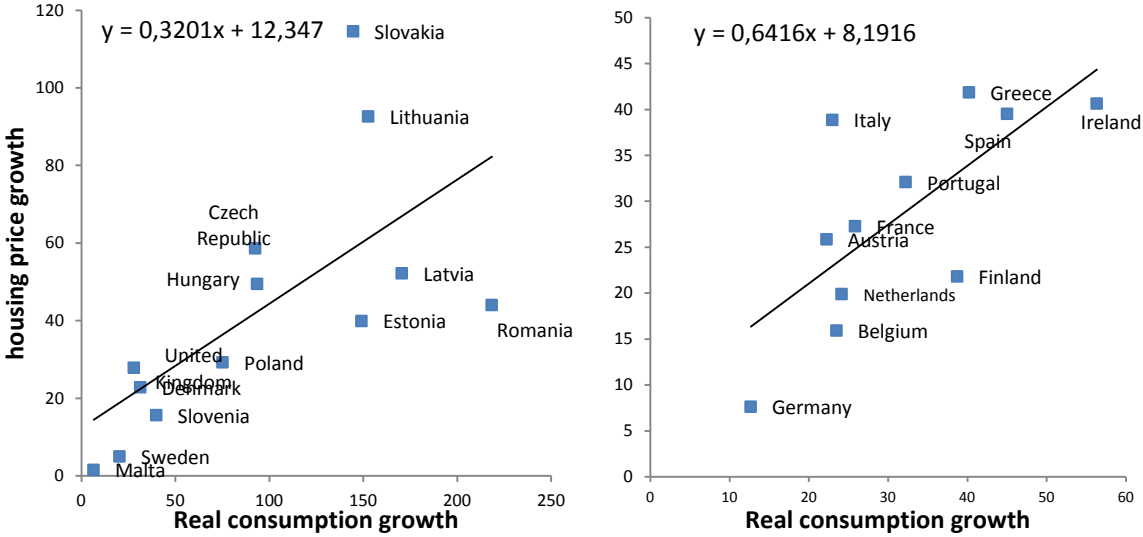

Figure 8. Housing prices and consumption growth in non-euro area and euro area members of the EU27, 2000-2007. Growth of imputed rental housing consumption deflator and of private consumption in volume terms, 2000-2007 (2001-2007 for Greece; source: Eurostat).

Consumption smoothing can explain imbalances, and these and other phenomena can in turn be explained by expectations of productivity growth, which if realized would explain the relationship between imbalance accumulation and subsequent production growth as in Figure 7. But Figures 2 and 3 indicate that productivity growth expectations were excessively optimistic for some countries. With the benefit of hindsight, it is clear that a crucial element of plausible convergence mechanisms was amiss. Figure 9 plots total productivity growth in 2003-07 against an indicator of imbalance growth in the previous five years. Across the EU27, total factor productivity did tend to grow faster where more negative imbalances had been accumulated, in particular because the negative changes in many Central and Eastern new member countries were followed by positive productivity growth. But no such tendency is apparent across early euro area members: in Portugal, Ireland, Greece, and Spain, large negative net international position changes in 1998-2003 were followed in 2003-2007 by negative productivity growth, mirroring the opposite experience of Germany and its neighbors. While these observations cover rather short periods, temporary aggregate demand fluctuation as noted above do not really offer an alternative interpretation of observed productivity dynamics which, while very noisily measured, can plausibly reflect the deeper phenomena indicated by their correlation with changes of broad institutional quality indicators.

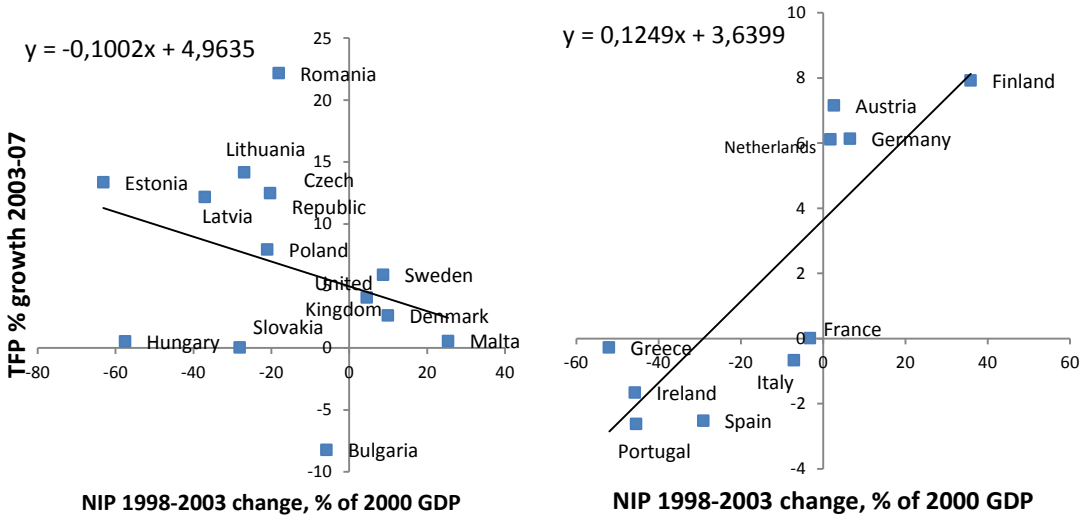

Figure 9. International imbalance accumulation and subsequent productivity growth in non-euro area and euro area members of the EU27, 2000-2007. Variation in 1998-2003 variation Net International Position, normalized by the 2000 nominal GDP (source: Eurostat) and 2003-07 total factor productivity log difference percent growth (source: Conference Board).

3.3 Income distribution

Across EU member countries, inequality is negatively related to per capita income, which is positively associated with (tax-financed) public social expenditure as a fraction of GDP, which are in turn negatively related to inequality (Bertola, 2010a). It is of course unsurprising to find that generous social spending reduces disposable income inequality. The negative relationship between income and inequality, and the positive relationship between income and social spending, can also be interpreted in terms of underlying structural factors from the theoretical perspective outlined in Section 2. While taxes, subsidies, and regulations may in principle perform beneficial roles that are beyond reach of imperfectly and incompletely informed markets, governments' attempts to do so encounter the same information and incentive problems as private market participants. To the extent that improving equality reduces production efficiency, richer countries may well find it easier to bear the efficiency costs of more extensive redistribution. The following subsections discuss how economic and financial integration may influence such relationships between income levels and redistribution-oriented policies.

3.3.1 Policy competition

Inequality is a concern not only of country-specific policies but also of the EU policy framework, which aims at "cohesion" as well as at "growth" and "stability". Relevant tools, however, are practically absent from the Union-level layer of the European policy framework reviewed by Sapir et al (2004). At the supranational level, structural funds have been deployed to enhance acceptability of integration across asymmetric areas, as well as to ease adjustment; open subsidization of industry is kept in check by State Aid rules; and relaxation of work and safety rules is also prevented by supranational legislation. But regulatory and tax competition are allowed in the social and employment policy fields, which are viewed as subsidiary and subject only to looser monitoring and comparison processes. The reasons why social and employment policies have in practice been neglected, despite many statements of principle in the Treaties, were analyzed by Bean et al (1998) and Bertola et al (2001) in earlier stages of the Economic and Monetary Union process. It is difficult for supranational policies to address the redistribution issues targeted by pervasive country-level welfare systems, because the political support and technical implementation of those systems is very much rooted in the history of European Nations. While "positive" supranational harmonization of social and labor market policies is very difficult across countries with different histories and income levels, its absence allows "negative" international market integration to undermine National policies.

In the European process of ever-closer market integration and incomplete policy harmonization, reforms of National policies can therefore be shaped, as discussed above, by incentives for each country to attract business with lower taxes, or to improve competitiveness with deregulation. Tighter economic integration may be expected to result in lower social policy expenditure, labor market deregulation, and stronger labor income instability. Lower social spending generosity and higher labor market flexibility were plausible outcomes also as other margins of adjustment and financial market development could be expected to reduce the need for protection from labor market risk, and the benefits of flexible labor reallocation could be expected to be stronger as shocks hitting labor markets were more likely to be region- or industry-specific than country-specific.

It is not surprising from this perspective to observe patterns of increasing inequality and flexibility-oriented reform at times of increasingly close integration not only within the euro area, but in the enlarging EU, and globally. Comparing countries that did and did not join the euro area, and the 1995-99 and 2000-04 periods, Bertola (2010a,b) finds that the tighter economic integration implied by the 'One Market, One Money' paradigm was indeed associated with substantially faster deregulation of their product markets, some deregulation

of their labor markets, and lower social policy expenditure. As a result, disposable income inequality grew faster in countries adopting the single currency, and these differences (like similar ones in employment and unemployment developments, analyzed in Bertola 2010b) were completely accounted for by differences in social policy and other policy indicators, rather than by economic integration directly. It is also possible, albeit on a case-study basis, to verify that incentives to do so are stronger for countries experiencing more elastic market responses to relative policy differences. Which country is more strongly subject to systems competition pressure depends on the specific integration experiment. When the Netherlands found itself the smaller partner of an essentially complete economic and monetary union with Germany, it was logical for it to adopt wage moderation and deregulation implemented by the 1982 Wassenaar agreement. The German "Agenda 2010" reform framework only took a similar path in the first half of the 2000s (Rinne and Zimmermann, 2012), after the country's reunification, euro adoption, and Eastern enlargement had changed the trade-off between high wages and idle labor on the one hand, and better competitiveness on the other.

3.3.2 Inequality and imbalances

The evidence just reviewed confirms the empirical realism of theoretical constraints on the extent to which competing policymakers may effectively control inequality within an integrated economic area. The impact of economic integration on inequality within each country, of course, also depends on the interaction of factor income changes and factor ownership patterns. Figure 10 illustrates a previously unnoticed empirical pattern that is particularly relevant to this paper's proposed interpretation of pre-crisis European Union imbalance accumulation. While within-country inequality broadly increased across the initial membership of the euro area before the crisis, it declined in Spain, Ireland, Greece, and Portugal, and increased more strongly in countries that accumulated international asset surpluses.

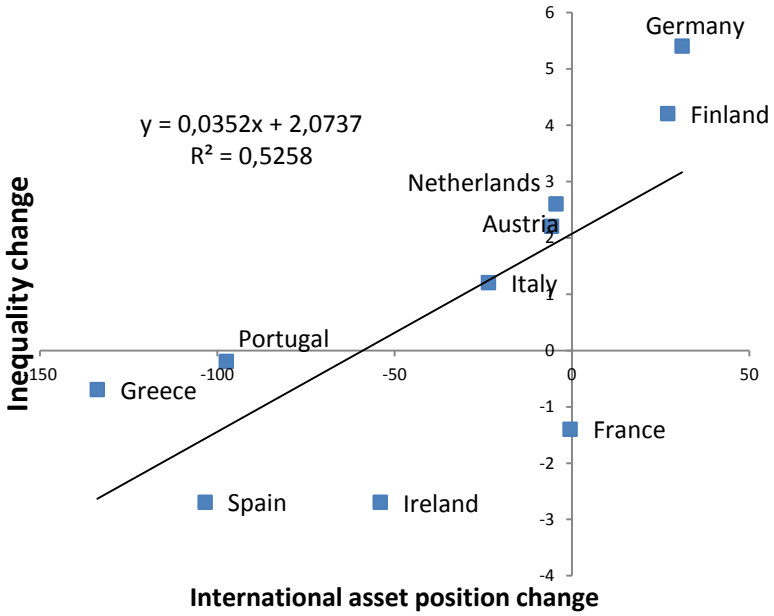

Figure 10. Changes of inequality and of international asset positisions across euro area members of the EU, 1998-2007. Variation of the Gini coefficient of equivalized household income (source: Eurostat); variation of the Net International Position normalized by the 2000 nominal GDP (source: Eurostat).

This pattern offers admittedly imprecise and indirect, but intriguing evidence that the theoretical mechanisms reviewed in Section 2 may have been at work during this period. The relationship between inequality and external imbalances could be superficially interpreted in terms of exogenously higher wages and loss of competitiveness. At a deeper level, it can be a reflection of structural mechanisms linking wages and redistribution to market internationalization. Economic integration and capital mobility allow wealthier individuals to earn the higher rate of return offered by investment in capital-poor countries, where relatively wealthy individuals no longer earn the high income of scarce capital. If ownership of internationally mobile factors is more concentrated than that of other factors, and international imbalances are driven by factor-intensity equalization forces, then theory predicts that inequality should indeed increase in countries that experience capital outflows, and decrease in countries where inflows imply capital deepening and, as shown in Figure 3, account for a large portion of production growth.

Depending on whether per capita production is more strongly influenced by capital/labor intensity or by the technological and organizational features summarized by total factor productivity as well as on capital intensity, capital inflows and decreasing inequality need not in general be associated with higher initial income. In Europe, before the crisis, income inequality did increase in Germany and other relatively richer countries experiencing

"downhill" capital outflows before the crisis, while decreasing in Spain and other initially poorer countries receiving capital inflows. As Figure 11 shows for all euro area countries where data are available, a general and in some cases remarkably close relationship can also be observed at the country level between the dynamics of inequality and net international positions.

Inequality changes are driven by multiple factors and mechanisms, including deregulation patterns driven by international policy competition. Countries that were poorer at the beginning of the period also tended to be those where social spending declined relatively faster as a proportion of their more strongly increasing income. While this may reflect stronger incentives to implement competitiveness-oriented reform, surplus countries (which also tend to be ageing faster over this period) may be those where lower social spending and labor market deregulation more strongly increased the volatility as well as the inequality of labor income, to imply stronger precautionary motives and external balance accumulation as an implication of weak domestic demand.[7]

[7] Carlin and Soskice (2009) argue that this mechanism can account for part of Germany's macroeconomic developments since the country's unification. Bertola and Lo Prete (2012) study in theory and document empirically in a panel of OECD countries the relationship between indicators of labor market deregulation and current account surpluses in the pre-crisis period.

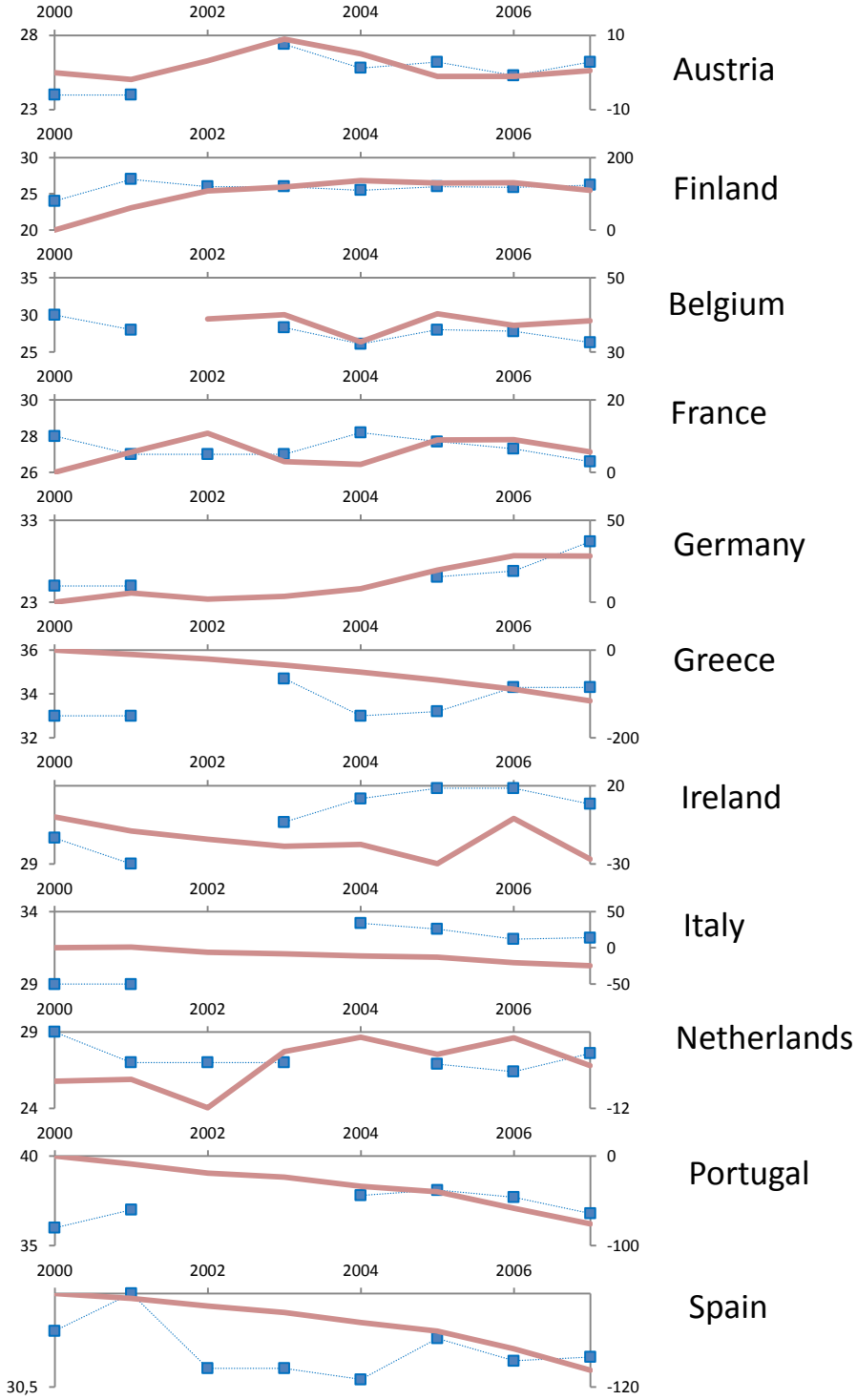

Figure 11. Time path of inequality and international asset positions in euro area countries, 2000-2007. On country-specific scales, symbols joined by dashed lines plot the Gini coefficient of equivalized household income (source: Eurostat) on the left-hand axis; the continuous line plots the international asset position change since 2000 as a percentage of 2000 GDP (source: Eurostat; data for Belgium are not disaggregated from Luxembourg before 2002).

While the data are too scarce and sparse for the purpose of disentangling convincingly various plausible theoretical forces, it is interesting to find that while openness changes are positively and significantly related to inequality changes (consistently with the evidence reviewed in Section 3.3.1), the significantly positive correlation displayed in Figure 10 is robust to controlling for the trade implications of economic integration. Empirical patterns are consistent with a plausible relaxation of competitiveness concerns when international borrowing opportunities are made available by financial market integration and expectations of productivity convergence. The slow factor productivity growth and declining inequality observed in countries that accumulated negative imbalances may in part have resulted from a tendency to trade production efficiency for social protection: a tendency that would have been justified if productivity growth had materialized but, possibly because the resulting production inefficiency was compounded by political and institutional deterioration, proved misguided in hindsight.

4. Crisis

Available data are generated by efforts on the part of market participants to update expectations on the basis of painful experiences, and of policymakers to identify constructive resolution paths. Hence, it is not possible to formulate a fully convincing and falsifiable interpretation of an unprecedented and still evolving crisis. While admittedly impressionistic, however, the evidence reviewed in Section 3 does provide suggestive support for the channels of policy and integration interaction outlined in Section 2. Consistently with the implication of economic integration for income distribution and policy competition, the path leading to the crisis was characterized in Europe by cross-country domestic production convergence and broadly increasing within-country inequality. The other theoretically sensible and problematic element of the integration experience, namely international imbalances driven by expectations of income convergence and consumption-smoothing behavior, is also quite apparent in the pre-crisis period, and intriguingly related to inequality developments. While it is not easy precisely to assess empirically the convergence implications of EU and euro area membership, the imbalances resulting from financial integration and the other phenomena briefly reviewed above offer intriguing evidence of the relevance of convergence expectations to pre-crisis imbalance accumulation.

The proposed perspective and the evidence reviewed in Section 3 offer insights as to the sources and implications of the following phase of financial and possibly economic disintegration. Social and employment policy reforms could be beneficial in a Europe where the Golden Age of post-war growth had in the 1970s been followed in many countries by widespread interference with labor market mechanisms, debt-financed social expenditures, and slowdowns of output and employment growth. Reform pressure is however a source of instability if, within each country, social objectives are still felt to be important, and unduly constrained by international competition. In the cyclical downturn of the early 2000s, it was common for public opinion and some National politicians to blame feelings of economic insecurity 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).[8] The financial and economic crisis has focused and will continue to focus attention on distributional issues, and more specifically on implications of fiscal, welfare, and labor policies for the distribution and stability of income, and of economic integration for the sustainability of the European system of economic policies.

The international imbalances explained by the policy convergence that the evidence reviewed above suggests was expected, but not realized, are vulnerable to the heterogeneity of such concerns across countries, and to the resulting difficulties in forecasting uncoordinated reform trajectories. As discussed above, sharply growing external imbalances were at least partly motivated by productivity convergence expectations across a financially integrated area. As discussed below, sustainability issues may have been triggered not only by a global economic and financial crisis that had asymmetric implications within the area, but also by realization that expectations of productivity convergence were to some extent mistaken.

The following subsections discuss how this perspective can help interpret the euro crisis in terms of mechanisms similar to those observed in developing-country experiences. In the data generated by emerging countries since the beginning in the 1980s of global trade and financial integration, business and policy cycles are well characterized by trend growth shifts (Aguiar and Gopinath, 2007), which can plausibly explain external debt sizes and default frequencies in

[8] Eurobarometer found in the mid-2000s that 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.

that experience from the perspective of theoretical models where default entails loss of output as well as of access to international financial markets (Aguiar and Gopinath, 2006). Models meant to fit the repeated debt accumulation and default experiences of such countries aim at reproducing the size of both debt stocks and interest rates spreads. While it is not possible to assess statistically the fit of any specific explanation for the single observation of the euro area's boom and crisis, it is interesting to examine how trend-shifting shocks, and the similarly crucial role of market-wide "risk factors" in determining financing difficulties for developing countries in international capital markets (González-Rozada and Levy Yeyati, 2008), may help interpret the euro area's international financial imbalances experience.

4.1 Expectations and imbalances

Imbalances generated and supported by convergence expectations can obviously be destabilized by revision of those expectations. Such a revision may plausibly have taken place when, by the late 2000s, the evidence was casting serious doubt on the realism in the euro area of the integration-related convergence that, as discussed in Section 2, can through consumption smoothing channels rationalize potentially very large and long-lived imbalances.

Assessing the persistence of growth processes is always empirically difficult in short time series, and even more so in the context of such an unprecedented experience as that of the European economic and monetary integration. Backward countries can certainly become more productive through imitation and adoption of better practices. In a world of partial and asymmetric information, however, this process is neither as automatic as in the simple illustrative models outlined in Section 2, nor as easy to predict on the basis of past experience as assumed by simple empirical representations of the interaction between economics, politics, and institutions (MacLeod, 2013). The evidence reviewed in Section 3 provided financial market transactions with only very diffuse priors as to the speed to convergence that might be expected in the euro area, and observation of realizations only very slowly provides information about average growth rates (Guneven, 2007). While the convergence that rationalizes very large debt accumulation is a central feature of the process envisioned by European integration, it is empirically elusive. Countries and regions may well converge only slowly, if at all. The difference between "slowly" and "at all" is well within the confidence intervals of plausible estimates, and has intuitive and dramatic implications for the appeal and sustainability of debt.

With hindsight, productivity convergence in the euro area was far from following the mechanical exponential expectations of the simple illustrative formalizations outlined in Section 2. To interpret simply the boom-and-crisis implications of uncertainty about the convergence implications of an unprecedented monetary unification experience, it may not be inappropriate to treat changes of convergence expectations as unexpected events. In a setting where future productivity growth expectations as in Box 4 imply large accumulated imbalances, Box 5 derives formally the resource transfers implied by a an unexpected permanent shock that decreases output of an indebted country to a level from which convergence may resume at a revised rate towards a possibly different final level. Under the simple assumption that default implies foregoing all past and future productivity convergence, the formula derived in Box 5 shows that forsaking integration can very well be attractive for a country hit by a negative income shock at a time when a large debt has been accumulated, and the expected rate and/or limit of the convergence process are revised downwards. Just like default can be deterred by disruption of economic activity and loss of access to international financial markets in developing-country models, so imbalances can remain sustainable across integrating economies as long as convergence expectations remain stable. But default and disintegration are possible, and somewhat self-fulfilling, if faith in convergence is lost.

This simple example illustrates more general insights. In the absence of other loss-sharing mechanisms, redefining the real value of legal obligations is more attractive when it becomes more burdensome to honor them because asymmetric shocks are associated with a decline of the expected rate of convergence, and/or coincide with increases of market-required rates of interest. Not only default on debt, but also devaluation (i.e. exit from the single currency) and inflation may on the one hand be deterred by the disruption they imply for pre-existing contractual arrangements and future developments, on the other become attractive in the face of unexpected shocks that change the future outlook in ways that make disruption and loss of credibility appear less damaging.

To the extent that imbalances were related to expectations of convergence in the euro area, revision of those expectations implied loss of confidence in the sustainability and character of economic integration. In the framework of Box 5, asymmetric shocks trigger default if they occur when imbalances are already very large, but only a little productivity growth has been realized. The global economy shocks that triggered the financial and economic crisis just a few years after inception of the euro certainly had asymmetric implications within Europe. The shock was less negative in surplus countries such as Germany, which had previously introduced

a more flexible layer in its labor market, possibly in response to the international competitive pressure discussed in Section 2. The German economic system proved able to withstand the crisis well, but this outcome was no more closely related to its institutional framework (which largely remained shaped by "social market economy" features, such as co-determination and relatively generous social policies) than to the financial and services character of crisis that turned out to be sharp but brief in Germany (Rinne and Zimmermann, 2012). Unreformed temporary layoff programs and a strong manufacturing export orientation made it possible for the country to limit employment losses, and for its export-oriented structure to recover quickly from the crisis as emerging countries growth resumed and the euro was weak against the US dollar and especially against the Japanese yen. To the extent that the crisis had more permanent implications for less manufacturing- and export-oriented economies, it also implied a revision of relative growth expectations for countries that found themselves mired in a more prolonged slump, and burdened with less sustainable financial imbalances.

Box 5: Sustainability

In the context of the previous Boxes' simple framework, suppose that at some time t' a shock reduces the level of productivity by a proportion z and induces an update to $\nu' \leq \nu$ and $a' \leq a_\infty$ of the rate and/or asymptotic limit of the convergence process. The present value of the country's immobile factor income is then updated to

$$\frac{1}{\rho} n(1-\alpha)\left(\frac{K+k}{AN+an}\right)^{\alpha}\left(\frac{\nu' a' + \rho a(t')(1-z)}{\nu'+\rho}\right)$$

and implies a lower permanent consumption level. Suppose it is possible to default on the debt and forego all productivity growth to date as well as all future convergence, so that productivity permanently reverts to $a(0)$. From the point of view of the country's representative agent, exercising the default option is optimal if the higher consumption afforded by ceasing to service the debt more than compensates the loss of permanent immobile-factor income, which is the case if

$$b(t')\rho > n(1-\alpha)\left(\frac{K+k}{AN+an}\right)^{\alpha}\left(\frac{\nu' a' + \rho a(t')(1-z)}{\nu'+\rho} - a(0)\right)$$

or, inserting the expressions $b(t') = n(1-\alpha)\left((K+k)/(AN+an)\right)^{\alpha}\left(a_\infty - a(0)\right)\left(e^{-\rho t'} - e^{-(\nu+\rho)t'}\right)/(\nu+\rho)$ from Box 4 and $a(t') = a_\infty\left(1-e^{-\nu t'}\right) + a(0)e^{-\nu t'}$ from Box 3, if

$$\left(a_{\infty}-a(0)\right)\frac{e^{-\rho t'}-e^{-(\nu+\rho)t'}}{\nu+\rho}\rho>\frac{\nu'\left(a'-a(0)\right)+\rho\left(a_{\infty}-a(0)\right)\left(1-e^{-\nu t'}\right)(1-z)}{\nu'+\rho}.$$

Loss of all past and future productivity gains quite intuitively suffices to deter default as long as income continues to evolve as foreseen by borrowers and lenders. But the inequality can be satisfied if a negative level shock is accompanied by downward revision of the rate and/or asymptotic tendency of the convergence process at a time when previous convergence expectations have already generated a large debt stock which has not begun to be repaid.

4.2 Loss sharing: financial instruments

The simple derivations in the Boxes model imbalances (across countries identified by different and changing production implications of institutions and policies and by limits to geographical mobility of goods and factors) in terms of a single interest bearing non-contingent financial instrument, as in standard intertemporal balance of payments models, and under certainty.[9] In reality, financial imbalances arise in variety of forms across a multitude of households and firms that hold portfolios of tradable and non-tradable assets and liabilities, and are linked to each other by country-specific constraints and institutions as well as by international financial markets. And the financial implications of real shocks depend crucially on how the value of outstanding instruments may react to realizations that diverge from expectations.

Sharing of contingent losses can take place through explicit contractual mechanisms. Equity and foreign direct investment, in particular, can fund a portion of international imbalances. The incidence of equity in international portfolio is not large, and its variation across countries and periods generally reflects both demand and supply factors as policymakers may prefer not to relinquish control of National champion firms, and institutional arrangements may not offer reliable guarantees against exploitation and expropriation (Stultz, 2005). While foreign-owned capital is not immune to sovereign expropriation risk, the European integration process aims at reducing that source of international financial market segmentation, as well as the cultural distance and legal differences that limit risk-sharing across countries even more than within countries (Obstfeld and Rogoff, 1995; Sørensen and Yosha, 1998).

[9] It would be conceptually straightforward, but complicated, to let the rate of convergence vary around its expectation in partially unexpected ways.

To the extent that equity investments are relevant, they are likely related to the portion of international imbalances that (as in Box 1) equalizes returns to internationally mobile production factors. Since "downhill" capital flows fund investment, they generate imbalances backed by claims to a portion of the country's production, which can be serviced by capital's marginal productivity, and their value can be automatically reduced by contingent valuation changes upon realization of asymmetric shocks.

To assess the relevance of such mechanisms, it can be useful to inspect the valuation component of net international position changes. If international assets and liabilities did effectively pool income and production risk across countries, one would expect to see a negative relationship between the income realizations of different countries' residents, and capital gains on external asset portfolios. The data shown in Figure 12 uncover very weak evidence of such international risk sharing during the euro area crisis. The international net assets of Germany did increase less than was implied by its current account surpluses, at the same time as its relative income increased, and symmetric developments are observed Greece and Portugal. The two variables, however, are not correlated across all euro area members. While their relationship may to some extent be confounded by inclusion in the current account of contingent payments, such as dividends and remittances, it appears to be driven by actual (as in the case of Greece) or feared default on fixed-income liabilities, rather than by inclusion of explicit contingent assets in international portfolios.[10]

[10] There is no clear relationship between the reaction of net international position values to income sshocks, and Eurostat data on stocks of inward and outward foreign direct investment. These were in 2008 much smaller in Greece (11.6% and 11.5% of GDP) and Italy (15% and 20.2%) than in Ireland (75.6% and 67.9%) and Belgium (177.1% and 168.7%), but these pairs of countries experienced very different covariation of income and valuation developments during the crisis.

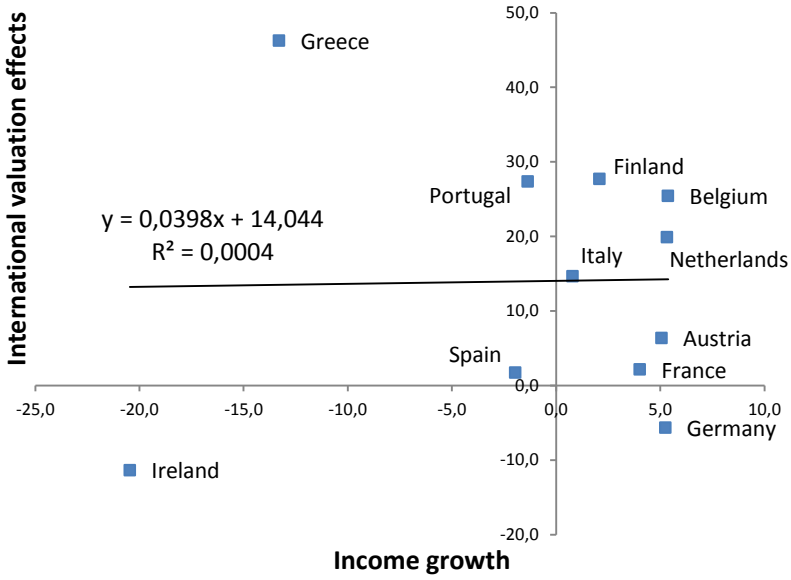

Figure 12. Relationship between international asset valuation changes and real income growth across early euro area members, 2008-2011. Valuation effects are measured as the 2011 Net International Position minus the sum of the 2008 Net International Position and the 2009-2011 current accounts in euro terms, in percent of the nominal 2008 Net National Income; income growth is measured as the percent variation of Net National Income as percent of GDP times GDP in volume terms (source: Eurostat).

The evidence reviewed in Jappelli and Pagano (2010), in fact, indicates that the bond market was the main channel of the financial integration trends induced by adoption of the euro. In particular, and not surprisingly in light of the expected productivity growth mechanisms outlined above, a significant portion of international imbalances was accounted for by public debt.

This is of course unsurprising, since international financial markets may be more accessible for governments than for households and firms; and just as public debt can beneficially smooth taxes over business cycles and in the face of wars and other calamities, so it can usefully fund public expenditures that, like non-tradable consumption, increase in anticipation of productivity growth.[11] Not only the rise, but also the crisis of public debts is related to the simple international integration mechanisms outlined in Section 2 above. While future

[11] Less obviously, wage growth might be driven by similar expectations if long-term employment contracts with back-loaded wage profiles anticipate to workers' current income the current purchasing power that would be more difficult for them than for their employers to borrow. This would introduce a time-varying wedge between wages and labor's marginal productivity, and imply that measured total factor productivity growth is a biased measure of production efficiency.

repayment appears easier if growth is expected to strengthen tax bases, it may actually be more difficult when factor mobility makes tax based more elastic. And, of course, default may well be politically more attractive when public debt it is held not by domestic residents but by foreigners, through its association with external net imbalances, or through international portfolio diversification.

Default risk can be controlled and pooled by bank intermediation. Consumption growth and construction booms were funded not by public debt, but by private credit markets in Spain and other debtor countries. The banking system can transfer funds across countries and over time and, to the extent that debt repayments may be defaulted, across individuals hit by different shocks. When assets and liabilities are unbalanced across countries, however, financial instruments that intermediate and share risks across borrowers and lenders operate across national borders. While an integrated banking system could in such circumstances offer suitable default risk diversification in the face of country-specific shocks, it fails to do so if banks seek to match their assets and liabilities along national lines, and their deposits are insured by country-specific schemes. In circumstances such as those experienced in the crisis, renationalization of financial portfolios actually amplifies country-specific shocks and policy-related risk through feedback loops whereby sovereign and bank default risks reinforce each other. From this perspective, it is quite obvious that institutional developments aimed at building a banking union would play a crucial role in increasing the euro area's robustness.

4.3 Loss sharing: public policies

From this paper's perspective, it is useful to discuss briefly the perhaps less obvious but certainly crucial role played by redistribution policies in preventing repayment difficulties from disrupting unavoidably imperfect financial markets. Within each country, social welfare systems use taxes and transfers to smooth out some of the welfare fluctuations implied by financial market imperfections. Unlike private insurance contracts, such schemes need to be mandatory to prevent adverse selection problems; like private insurance contracts, they need to be supported by suitable legal and administrative frameworks.

No such mechanism exists across member countries of the European Union where, as discussed above, social insurance schemes are implemented independently and are constrained by international competition. This configuration results from historically determined heterogeneity of National welfare schemes, and lack of supranational political consensus on the costs and benefits of any such scheme. Before the crisis, market competitive

pressure was widely felt to have potentially beneficial implications for reforms of welfare schemes that were in some respects obsolete, and in others captured by special interests. The implications of this feature of the European policy framework also have important implications for its sustainability in response to shocks.

It is interesting to contrast the performance of European fiscal instruments during the recent crisis with that of the very different configuration of taxes and transfer in the United States, an economic and monetary union that is not in danger of breaking up during the current crisis, and is in other ways rather similar to the European Union. The Bureau of Economic Analysis publishes data on personal income, personal taxes, and personal transfers at the US State level. Net transfers across States are persistent: during 1991-2010, they were always positive in poorer States (such as Alabama) as well as in States with inflows of elderly Social Security recipients (such as Florida). This is not as contentious in the US as it might be across member states of the EU, and as they are within countries such as crisis-hit Spain, because labor mobility weakens geographical identities, and market integration is accompanied by federal co-financing and supervision policies that prevent race-to-bottom tensions, and are in turn supported by a robust political framework. Net transfers, however, do fluctuate strongly over time in response to State-specific economic shocks: most States experience both negative and positive transfer balances over the 1991-2010 period, and the standard deviation over time of 2010 CPI-deflated per capita net transfer is comparable (at about 1000) to its mean value (ranging from USD 2300 in Alabama to USD -2300 in Connecticut). In the US, more smoothing takes place through explicit fiscal instruments rather than through public debt (as budgets should tend to be balanced at the State level, most public debt is Federal).[12]

The order of magnitude of growth fluctuations is similar across US States and EU27 member countries, and the distribution of per capita income levels is also roughly comparable in the two data sets. In both cases, income growth is smoothed by taxes and transfers. Not surprisingly, however, the US fiscal system smoothes cross-sectional disposable income shocks much more effectively than the separate fiscal systems of European Union member countries.

[12] A figure of possible interest is the total absolute size of net transfers, computed for each state as [per-capita net-of-tax transfers minus the corresponding US-level per capita figure] times population. This is an indicator of dispersion across US States of the redistributive component of the (mostly Federal) fiscal deficit (surplus in the late 1990s), neglecting corporate and other non-personal taxes as well as government consumption. In the 1991-2010 period, it fluctuates between 2.7 and 5 percent of aggregate US personal income (which essentially coincides with GNP) and averages 3.96%, about a third of the average personal tax (11.99%) or personal transfer (13.85%) rates over the period.

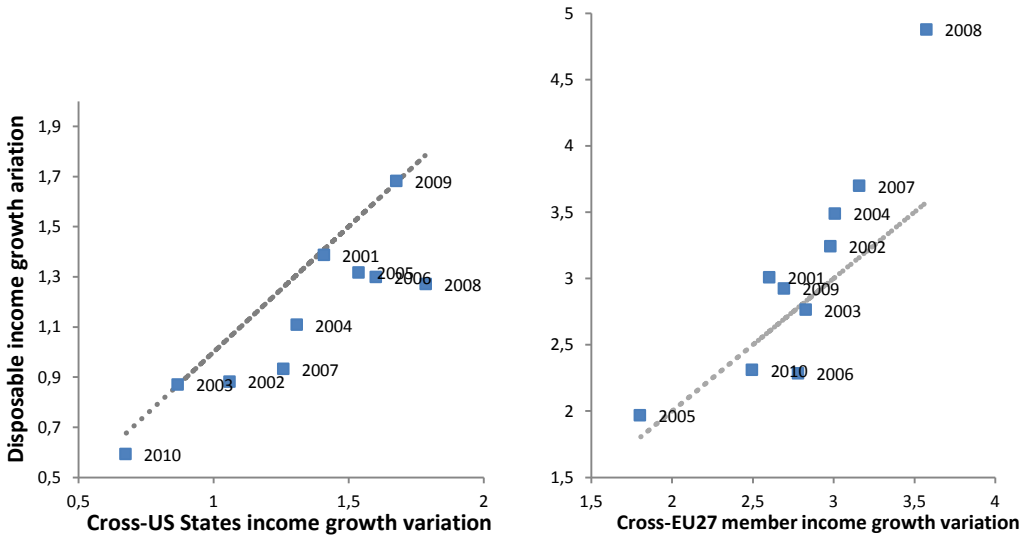

Figure 13. Variability of disposable and gross income yearly growth across US States and EU member countries. Cross-sectional population-weighted standard deviations of annual gross income growth and disposable income growth; 45 degree lines bisect both diagrams, labels indicate the year for which the standard deviation is computed. For US states, gross and disposable income are in per capita terms, deflated by the US consumer price index; sources: Bureau of Economic Analysis and Bureau of Labor Statistics. For EU member countries, income growth is computed from per capita GDP in PPS terms, disposable income growth from per capita household disposable income in PPS terms; source: Eurostat.

Figure 13 shows that post-tax-and-transfers income growth variation across States is never larger than its gross counterpart in the United States in 2000-2010, and approaches it only twice. Conversely, a larger dispersion in net than in gross terms is the rule rather than the exception across EU27 Member States over the same period. Before the crisis, disposable household income growth was often more diverse across EU member countries than GDP per capita growth. In that period, trend growth differentials across EU countries may have been driven by convergence patterns more strongly than in the United States, inducing new member countries to run budget deficits.[13] The difference between net and gross income growth dispersion is remarkably large and positive in 2007 and 2008, when banking and sovereign debt crises hampered such countries' ability to shelter their citizens' income from negative shocks.

[13] On the basis of this statistic, fiscal policy to some extent appears to have magnified country-specific trends and shocks, but private financial instruments may have effectively smoothed income differentials and shocks before the crisis. Jappelli and Pistaferri (2011) document an association, in Italian household surveys until 2006, between adoption of the single currency and smoother consumption even as income volatility was increased by reforms that, consistently with the theoretical insights outlined in Section 2.2, deregulated labor markets in response to policy competition pressures.

Figure 14. Fiscal wedges and income growth across US States before and during the Great Recession. Circles plot to 2003-06 growth rates, triangles plot 2007-10 growth rates. Gross and disposable personal income in per capita terms (source: Bureau of Economic Analysis), deflated by the US consumer price index (source: Bureau of Labor Statistics).

As shown in Figure 14, taxes and transfers implement rather orderly redistribution across US States, both before and during the Great Recession. The fraction of gross relative income fluctuations smoothed by fiscal transfer is not large: at about 15%, it is very similar to the estimate obtained by Asdrubali, Sørensen, and Yosha (1996) on much earlier data. It is also remarkably stable in the face of the sharp aggregate contraction observed during the crisis. Figure 15 instead displays widely different relationships across the EU27 between country-specific gross and net personal income growth: fiscal policy did smooth personal income before the crisis, but not during it, when divergent imbalance burdens, different depreciation possibilities, and emergency fiscal policy reactions completely removed any such tendency.

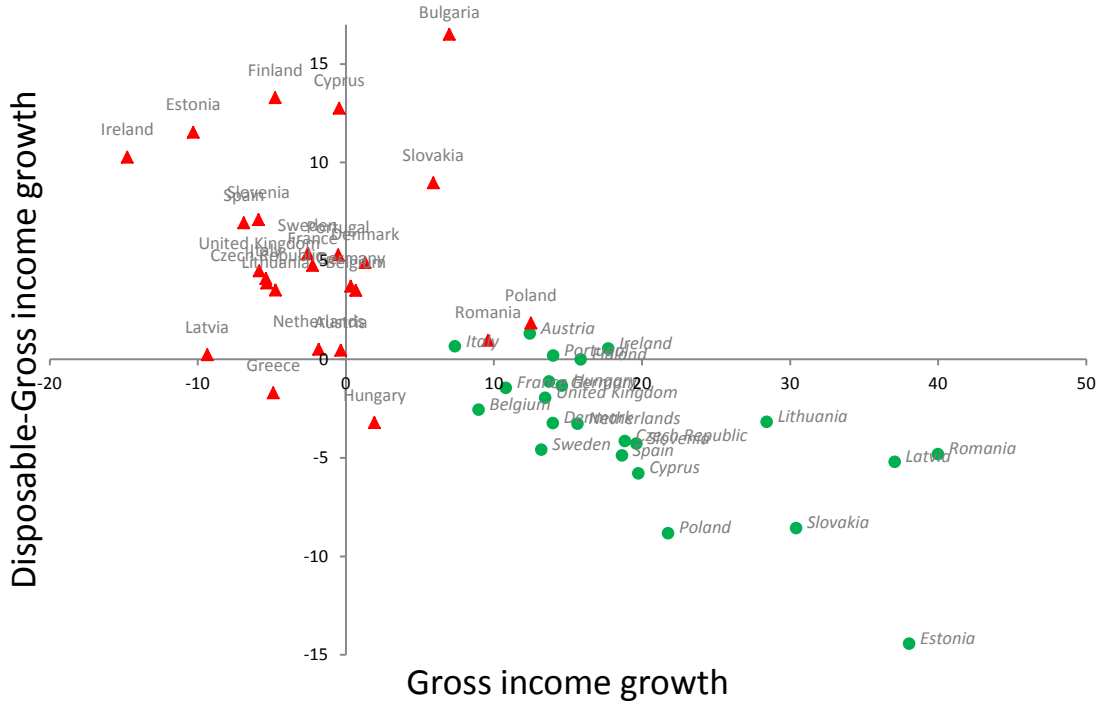

Figure 15. Fiscal wedges and income growth across EU member countries before and during the Great Recession. Circles plot to 2003-06 growth rates, triangles plot 2007-10 growth rates. Gross income growth is measured in per capita GDP in PPS units, disposable income growth is measured for household disposable income in PPS units (source: Eurostat).

Contingent redistribution schemes, such as unemployment insurance, act as automatic stabilizers within the United States and within each European Union member country. But as only default risk, debt restructuring, and other imperfect financial adjustments are deployed across the member countries of the European Union, imbalances became a source of instability and potential economic disintegration when the crisis made them more burdensome for countries hit by more negative shocks, and convergence expectations were reviewed and updated.

Is not possible or necessary to dwell here on the detailed mechanics of the crisis, and on ways in which adjustment is especially difficult for countries where internal competitive conditions imply that prices and wages are rigid, high margins contribute to keep productivity low, and political and social cohesion is too weak to allow effective coordination. Policies meant to foster adjustment through wage moderation, deregulation, and coordinated "internal devaluations" are not painless, and do not by themselves ensure that crises similar to the current one will not recur if, as suggested by the longer-run perspective adopted here, the equilibrium shift is rooted in a reappraisal of convergence prospects. For this paper's purposes

it may instead be important to discuss briefly the labor mobility implications of asymmetric shocks. Population changes can certainly smooth adjustment to geographically concentrated shocks. Even at the yearly frequency of the statistics inspected above, per-capita income is noticeably smoother than aggregate income across US States. Migration, which of course entails nontrivial personal and social costs, also endangers the sustainability of local taxes and subsidy schemes. The National pension system of Greece would certainly not be viable if the country experienced mass out-migration of active workers on the scale observed in some US States, or indeed in East Germany after unification (Burda and Hunt, 2001), where Federal pension and social policies can buffer the impact on those who remain behind of labor mobility's contribution to the decline of local tax and contribution bases.

Whether resulting from misguided policies or from unexpected shocks, revision of growth prospects requires rebalancing of consumption and savings patterns, as well as changes in the dynamics of productivity and compensation, and of non-tradable prices. Distribution of crisis losses across different countries and individuals is a difficult process in a situation where not only financial markets, but also social contracts are incomplete. While the divergent pattern displayed in Figure 15 is of course not surprising in light of the substantial absence of fiscal transfer mechanisms across European Union Member Countries, it does cast doubt on the sustainability of an economic policy system that delivers neither growth, nor stability, nor cohesion.

5. Economic and policy integration and convergence

In the 2000s, the European policy system achieved monetary unification but proved unable to coordinate macroeconomic fiscal policies, and refrained from coordinating social or employment policies. Allowing wages and prices to be determined by competitive forces, it relied on systems competition to achieve convergence, and on financial markets to redistribute resources across countries and over time. This process promises rich opportunities but also, as the crisis shows, features deep pitfalls, notably in the form of financial imbalances that are certainly not larger, but also not as robustly supported, than those across households, firms, or regions within established Nations. Across heterogeneous countries, imbalances are magnified by expectations of institutional and cultural convergence, and may be unsustainable in a crisis that casts doubt on those expectations.

Institutional convergence is not automatic, and can be politically difficult because economic integration implies changes in income inequality across individuals who are differently exposed

to international competition and/or differently affected by the less incisive redistribution implied by competing social and employment policies. In the current crisis context, high unemployment can only decrease the popular appeal of an economic integration process that imposes strict competitiveness constraints on social and labor market policies, and lack of suitable risk-sharing mechanisms across countries' borders similarly generates political tensions conducive to disorderly disintegration.

5.1 Policy coherence

Such problems could be potentially controlled by suitable harmonization and integration of European welfare systems, of the type envisioned by Bertola et al (2001). In theory, market integration should be complemented by coordinated minimum welfare benefits, co-financed centrally to prevent systems competition from resulting in unacceptably low levels of welfare provision, and set at levels compatible with suitable work and mobility incentives within and across differently developed areas; and by harmonized unemployment benefits and pension schemes that, while designed so as not to redistribute resources ex ante and not to require central funding, should be mandatory and comprehensive enough to provide the insurance against life events that private financial markets cannot supply, redistributing resources across areas and industries, as well as across individuals, in the face of ex post asymmetric shocks.

In practice, the design and implementation of suitably integrated social policies entails formidable political and technical problems. The logical necessity of steps in that direction however follows from the fact that European integration is first and foremost a political process, which uses market unification as a tool to achieve the ultimate "growth, stability, and cohesion" objectives of European societies through the "ever closer integration" that was meant to prevent future wars in the aftermath of World War II, to ensure commitment to democracy in countries that like Spain, Portugal, and Greece had experienced dictatorship, to ease the post-Communist transition of Central and Easter European countries. Implementation of political and cultural objectives through economic tools, however, cannot by itself address deeper political and distributional issues. As discussed in much detail by Sapir et al (2004), the resulting system of economic and political interactions can suffer from policy incoherence. Economic integration is a valuable but risky asset, which promises high returns in terms of growth and stability, but need not deliver them along with cohesion. It is difficult to offset market failures by appropriate tax-and-subsidy or regulation schemes when decision-making is decentralized to constituencies that are small relative to the scope of economic interaction

across a large integrated area. Local decision-making, unfettered integration of factor and product markets, and a desire to protect one's own citizens from poverty are the three elements of an inconsistent trinity of which one, or part of each, must be sacrificed: decision-making must be centralized or coordinated to preserve both redistribution and economic integration; alternatively, redistribution can be abandoned, though "race to the bottom" dynamics that are likely to be politically unacceptable in Europe, or economic integration may remain imperfect. A policymaking framework maintaining all three elements as basic principles is internally incoherent. As the crisis has been showing, uncertainty regarding which element will be excluded from that trinity makes it dynamically unstable and inconsistent over time. as well as across policy objectives.

While the European policy framework as currently configured is proving unable to achieve any of objectives, the crisis experience does not reduce the desirability of economic and monetary integration, nor does it prove that expectations of convergence are always and necessarily mistaken. It does however call for a reconsideration of the mechanisms underlying economic and monetary unification, and for identification of instruments that would ensure its robustness. Growth is not an automatic implication of economic integration, which is an arguably necessary but far from sufficient condition for better efficiency (Sapir et al., 2004). The 2000s cycle of rising hopes and crushing crises similarly indicates that convergence, while a plausible consequence and necessary complement of economic integration, is neither as automatic nor as steady and predictable as policymakers and market participants appear to be have expected it to be.

International integration is a delicate process which, while aimed at fostering institutional and economic convergence across heterogeneous sets of institutions within integrated markets, can self-destruct if failure to deliver on that promise and asymmetric shocks destabilize the imbalances created by convergence expectations. Within and across countries, cultural and organizational convergence may only result from processes that present political problems as well as economic opportunities. While an irrevocable and ever closer integration process appears necessary for Europe to achieve a globally relevant economic scale as well as to preserve social peace, political sustainability and dynamic credibility of that process is not ensured by its current configuration, which lacks the supranational policy framework that could in turn only be developed by comprehensive and forward-looking political interactions.

The perspective adopted in this paper identifies two relevant dimensions to the often-voiced need for EMU-deepening measures. First, it suggests that subtle aspects of some countries' institutional and political evolution may be ultimately responsible for their failure to achieve the productivity-driven growth that would ensure sustainability of accumulated imbalances. Second, it highlights how missing shock absorbing mechanisms threaten the sustainability not only of financial imbalances, but of the integration process itself, as disorderly cross-country and cross-institution resource transfers exacerbate the implications of asymmetric shocks and expectation revisions.

In the European integration process, as in any socio-economic system, policy should prevent and manage accidents. Suitable instruments have long been identified for policies focused on financial instability and unemployment. To prevent self-fulfilling bank runs, deposits should be insured, and banks should be subject to reporting and regulatory requirements so as to prevent their owners from taking excessive risks. To protect workers from income losses, involuntary unemployment should entitle them to subsidies, and employment officials should monitor their behavior to prevent the availability of benefits from increasing job losses, and reduce job findings.

In the European integration context, supranational policies should on the one hand transparently monitor policy developments; on the other, grant contingent and conditional access to emergency resources. Inasmuch as the 2000s rise and crisis of imbalances has made it clear that convergence of national policy cultures is not automatically implied by economic integration and adoption of a common legal and policy framework in most areas, it would be desirable to foster productivity-enhancing policy processes. And inasmuch as the crisis has made it clear that uncoordinated policies makes the European policy system vulnerable to asymmetric shocks, it would be desirable to try and complete it with the regulatory and redistribution schemes that in all countries complement financial market interactions. The following subsections outline how these issues could be addressed by hitherto missing features of the European policy framework.

5.2 Behavior-shaping policies

The institutional evolution of the EU policy system shows keen awareness of the need to ensure suitable international coordination, and assigned coordination of social and employment policies across interconnected national markets to the loose "open method of coordination" approach. While that process was indeed meant to spread best practices and

achieve greater convergence, the suggestive evidence reviewed in Section 3 indicates that, in practice, the evolution of country-specific welfare policies was shaped more by the strength of policy competition pressures than by soft coordination processes. Prevention and correction of excessive macroeconomic imbalances are also entrusted to a process that aims at shaping policies more through information-gathering, discussion, and shaming than by the rather remote threat of financial penalties. From this perspective, the Macroeconomic Imbalance Procedure Scoreboard indicators can serve the useful purpose of instilling realism in market participants and policy makers' expectations, alerting them to possible problems by providing factual information and informed analysis. The economic and financial monitoring and constraints envisioned by the "Six Pack" may play a role akin to the supervision role of banking authorities for government policies within the EU.

But while it would be hard to deny that "excessive" imbalances are dangerous and should be prevented, it is even harder to identify circumstances in which imbalances are indeed excessive, and to find ways to prevent them. Policymaking bodies need not be better equipped than market participants to assess balance-sheet imbalances within and across countries. And it may be misleading to focus surveillance narrowly on competitiveness and other indicators that, as suggested above, may be manifestations of underlying policy tensions and of potentially plausible convergence expectations. If expectations of convergence rationalize financial imbalances and the dynamics of competitiveness, then country-specific analysis and any corrective actions should focus on those expectations, rather than on their manifestation in market-determined financial flows, prices, and wages.

Expectations appear to have been excessively optimistic in pre-crisis experience (and might well err on the side of pessimism in the current crisis), and realizations of productivity growth that turn out to be related to country-specific changes of broad institutional quality indicators. Within the euro area, there was before the crisis a tendency for countries that accumulated negative international imbalances to experience deterioration of institutional quality as well as of total factor productivity. Unfortunately, it is much easier to detect such problematic developments than to identify their deeper causes and possible remedies. Adoption of the common currency certainly eased international financial integration, and fostered expectations of faster convergence than just Single Market integration, but also appears to have prevented that expectation from being realized, perhaps because capital inflows relaxed external competitiveness constraints.

5.3 Loss-sharing schemes

In every economy, imperfect markets and imperfect policies together determine how the costs and benefits of change are shared across individuals. Fiscal monitoring and constraints should in principle be complemented by a social and labor market framework that on the one hand coordinates relevant policy actions in different countries, and on the other steers resources towards member countries that, through no fault of their own, are hit by relatively more negative shocks. As currently configured, the EMU policy system features no effective coordination of country-specific tax and transfer schemes, and no cross-country contingent transfer mechanism. This not only makes it vulnerable to the distributional concerns addressed by public policies within traditional Nation States, but also reduces the efficiency benefits of market integration. Economic choices should be driven by productivity differentials, not by different tax obligations. In the absence of suitable public or private financial channels of adjustment to persistent asymmetric shocks, conversely, not only renationalization of financial markets but also outgoing labor and capital mobility tend to make high public debts unsustainable in crisis-hit countries.

The policies and institutions that could suitably buffer asymmetric shocks are superficially similar to those deployed in the form of Structural Funds to ease the impact of economic integration upon accession of less developed member countries. They are also related to the fiscal policy instruments that can stabilize asymmetric shocks from the standard “Optimal currency areas” perspectives on economic fluctuations. Predetermined prices in terms of a common currency reduce uncertainty, and increase efficiency of contractual transactions and search processes; but they also make it more difficult to adjust to shocks hitting specific regions, household, or firms within a country, and specific countries within a currency union. Insurance against such macro shocks is more valuable for society than for uncoordinated market participants (Farhi and Werning, 2012). Hence, international fiscal stabilization instruments should logically be included in the EMU economic policy framework.

The process that drives economic and cultural convergence, however, is subject to shocks that are much less predictable than regional or peripheral adjustment problems, and much more persistent than is typical at the business cycle frequency. Self-insurance can be effective against temporary shocks, and can take the form of “rainy-day fund” provisions in country-specific fiscal policy paths. But only contingent transfers can protect individual and countries against persistent shocks. A credible and stable framework featuring appropriate contingent

shock absorbers would be needed to prevent politically and economically unsustainable spirals such as those currently observed, and foster virtuous dynamics. Just like “one money” is a logical complement of “one market,” and a common financial supervision scheme is logically required by a common financial market, a properly configured EMU-wide contribution and subsidy schemes would logically complement integration of services, goods, and factor markets.

Within each country, indeed within each city, economically strong areas and individuals coexist with weaker ones, shocks have asymmetric effects, and not only private but also public financial instruments fill gaps between consumption and income levels. In principle, the same fiscal policies that address such issues within countries might be deployed by a coherent EU policy framework, possibly inspired by the system of federally co-financed and regulated welfare policies that in the United States are administered at the State level, and complemented by a fully federal Social Security scheme. A “fiscal capacity” that might, for example, fund non-employment benefits with payroll taxes across all EU countries, could not only smooth the implications of local shocks but also issue obligations that, backed by area-wide production rather than by tax bases vulnerable to systems competition and to asymmetric shocks, would provide a safe asset to the area’s financial system, and allow tax smoothing in the face of area wide shocks.

In practice, it appears very difficult to envision harmonization within such a scheme of the welfare systems developed in each EU Member when industrial plants and cities replaced farms, workshops, and villages. The heterogeneity of European Welfare State goals, tools, and scope can be categorized in terms of “models” (Esping-Andersen, 1990; Bertola et al, 2001) that are deeply rooted in each country’s socio-political system, remarkably resistant to economic shocks, and very different not only in terms of generosity but also, and especially, of institutional structure and technical implementation. For example, historical tradition and administrative capacity lead some countries use unemployment insurance, others to use employment protection regulation to shift labor market income risk away from workers and towards firms with better access to financial markets or to collective redistribution schemes. The evidence in Bertola (2010b) detects a tendency for more tightly internationally integrated countries to prefer unemployment insurance, which is sensible since it is more difficult for firms to bear production efficiency losses when competitiveness concerns are stronger. But harmonization of heterogeneous welfare schemes is a difficult technical problem, which would be eased if positive integration “carrots” accompanied the negative integration constraints

imposed by market integration on national policies. The supranational funding of reforms envisioned by the "Convergence and Competitiveness Instrument" proposed in the European Commission's "A Blueprint for a Deep and Genuine EMU" COM(2012)77 document may be a suitable step in that direction. From the perspective proposed here, deployment of contractual financial incentives should prevent policy paths that, while politically attractive within countries, threaten sustainability of integration.

To the extent that the necessary policy corrections depend on country-specific features, however, the technical problems entailed by specification of suitable reform clauses are also very difficult. It would not be appropriate for employment and social policy reform incentives to be inspired by country-specific performances during the current crisis, when employment and output outcomes were largely determined by shocks rather than by institutions. Future shocks will likely be different, and economic integration does not imply quick convergence of the relevant socio-economic characteristics. Hence, countries facing the worst crises should not rush to imitate the labor market configuration of better-performing countries.

6. Concluding comments

Across sets of households and firms tied together not only by geographical location but also by institutional and cultural features, intertemporal and state-contingent payments are implemented by taxes and transfers as well as by financial and insurance contracts. And cohesion is fostered by social and labor market policies that, while certainly subject to moral hazard, protect citizens from unfair risk, and seek to preserve work incentives with suitable monitoring of individual behavior with contingent payments. Across countries, even within the European Union, almost only financial contracts operate, and the crisis has proved that they cannot effectively withstand asymmetric shocks and revisions of expectations. All repayment promises include implicit contingent default options, which are not exercised as long as debtors have a stake in preserving their relationship with lenders. Sustainability of international imbalances also relies on self-interested preservation of the benefits of economic and institutional integration, and is therefore vulnerable to loss of faith in those benefits. Since economic integration is as rich in promises as in pitfalls, it should be supported by a system of shock absorbers which are notably absent in a system that lacks both effective coordination of country-specific social and employment policies, and by well-defined contingent transfer instruments aimed at sharing losses more efficiently than in a disintegration and default equilibrium.

In all European countries, the income stabilization role of taxes, transfers, and regulation is too important to be exposed to the system competition pressure exercised by integrated markets. Just because the integration process is subject to volatile and persistent shocks, it would benefit greatly from strong and full commitment to contingent redistribution schemes. While redistribution can be excessive, and can go in the wrong direction, and is certainly not liked by all, there can be no presumption that redistribution policies are generally harmful. If markets imperfectly address the relevant issues, relying on automatic competition among equally imperfect policymaking systems cannot imply better outcomes than a well-informed, coherent policymaking framework. Since each country's socio-economic policy is deeply rooted in specific social and institutional features, it would be necessary, and difficult, to build a political interaction framework across the borders of Europe's Nations. National policies and reforms compete and interact in integrated markets, and devising a similarly integrated supranational social and employment policy framework is clearly more difficult even than adopting a single monetary policy. But just like a single money was the logical consequence of product market integration (which needs stable exchange rates) and capital market integration (which equalizes interest rates), so a common employment and social policy framework is logically necessary in borderless markets throughout which not only goods but also persons, services, and capital are free to move, and market-correcting policies need to be enforced at the collective level.

The imbalances that can be justified by expected institutional developments need to be supported by suitable coordination and monitoring of those developments. Regulations and tax-and-subsidy programs that reduce production efficiency do so for the politically sensible purposes of redistributing consumption over individual lifetimes, smoothing it, or redistributing resources across individuals (whether towards disadvantaged members of society, or towards special interests). Just like for every individual within traditional nations, it is natural for each sovereign country to try and achieve the best possible self-interested outcome: working harder is not a pleasure, and politically difficult structural reforms need to be motivated and shaped by market and institutional forces, credibly link current adjustment problems to future gains, and address distributional issues. To be effective, both financial contracts and redistributive schemes need reliable information and suitable enforcement. From this perspective, a coherent and credible European Union policy framework would need to be equipped with more than just information on and analysis of member country policies and budgets. Of course, sovereign nations feel entitled to freedom of choice in politically

sensitive areas. The limitation of individual freedom of choice that citizens of any country accept as a condition for participation in financial markets and welfare schemes would imply loss of sovereignty for EU member countries. While some desirable policies might in principle be implemented directly at the supranational level, the political legitimacy and sustainability of the needed framework would likely be strengthened by its articulation in terms of subsidiary national policies, subject to appropriate monitoring, and shaped by co-financing incentives.

Market relationships have to rely on a social and legal framework, and a dramatic unprecedented crisis can threaten disintegration of any economy. Within nations, social and market relationships rarely break down during crises, because they can rely on orderly bankruptcy procedures, lenders of last resort, inflationary escape paths, and social safety nets. The current crisis shows that all these would have been useful at the European Union and euro area level, which are neither as well equipped nor as unbreakable as traditional Nation-States. It has become customary for those pondering euro area monetary integration problems to wonder at the size of monetary payment-system imbalances which, if the euro were fully irreversible, would not only be unproblematic but would have no reason to exist. The same is true of the more general tensions studied in this paper. Sustainability of international integration is threatened by loss of faith in its character and implication. On the basis of a single crisis observation, it is hard to ascertain whether bad behavior or bad luck caused the combination of productivity divergence and asymmetric shock that casts doubt on imbalance repayment, and threatens disintegration. Lenders may justifiably mistrust peripheral countries' willingness and ability to improve their institutions and productivity, and borrowers may be dismayed by the unwillingness of countries hit by relatively favorable shock to share their good fortune. Even as the veil of ignorance is partly shredded, however, it should be possible to devise and price insurance against future shocks.

In the scenarios that it is possible, albeit not easy, to outline for the future of EMU, these misunderstandings and political difficulties should be eliminated by development of explicit transfer mechanisms, and by robust expansion of political interactions beyond the National level which a few centuries ago replaced smaller geographical locations as the locus of market activity and collective action. While the European Union's politico-economic problem is simply stated, it is also very difficult to solve. As the project is meant to go beyond nations, it cannot rely on nationalistic feelings that are weak at the European level, and have been weakened by re-nationalization tendencies during the crisis. Rational commitments to contingent sharing would need to be rooted in supranational political interactions, but these do not appear to be

an automatic consequence of economic integration. Formidable political commitment and technical implementation problems would need to be solved on the way towards a sustainable configuration of the European economic policy system. It is fair to doubt that those problems can be solved without a favorable evolution of the shortcomings of EU member country political processes and of the EU institutional structure that underlie both the origin of the current crisis, and the difficulties encountered in resolving it.

References

Aguiar, Mark, and Gita Gopinath (2006) “Defaultable Debt, Interest Rates, and the Current Account” Journal of International Economics 69 64-83

Aguiar, Mark, and Gita Gopinath (2007) “Emerging Market Business Cycles: the Cycle is the Trend” Journal of Political Economy 115:1 69-102

Arkolakis, Costas, Arnaud Costinot, and Andrés Rodríguez-Clare (2012) "New Trade Models, Same Old Gains?" American Economic Review 102:1, 94–130

Asdrubali, Pierfederico, Bent E. Sørensen, and Oved Yosha (1996) "Channels of Interstate Risk Sharing: United States 1963-1990" Quarterly Journal of Economics 111:4 1081-1110

Barro, Robert J. and Xavier Sala-i-Martin (1992) "Convergence" Journal of Political Economy 100(2): 223-251

Barro, Robert J. and Xavier Sala-I-Martin (1997) “Technological Diffusion, Convergence, and Growth” Journal of Economic Growth Vol. 2, No. 1, 1-26

Barro, Robert J., N. Gregory Mankiw, and Xavier Sala-i-Martin (1995) "Capital Mobility in Neoclassical Models of Growth" American Economic Review 85(1) 103-15

Bean, Charles, Samuel Bentolila, Giuseppe Bertola, Juan J. Dolado (1998) “Social Europe: One for All?” CEPR, Monitoring European Integration 8

Bertola, Giuseppe, Juan Francisco Jimeno, Ramon Marimon, and Christopher Pissarides (2001) “EU Welfare Systems and Labour Markets: Diverse in the past, integrated in the future?” in G.Bertola, T.Boeri, G.Nicoletti (eds.), Welfare and Employment in a United Europe, MIT Press, 23-122

Bertola, Giuseppe (2010a) “Inequality, Integration, and Policy: Issues and evidence from EMU" Journal of Income Inequality 8:345–365

Bertola, Giuseppe (2010b) "Labour Markets in EMU: What has changed and what needs to change" pp. 715-758 in The Euro: The First Decade, M.Buti, S.Deroose, V.Gaspar, J. Nogueira Martins (eds.), Cambridge University Press

Bertola, Giuseppe, and Anna Lo Prete (2012) "Labor Market Reforms, Finance, and the Current Account" working paper

Blanchard, Olivier and Francesco Giavazzi (2002) “Current Account Deficits in the Euro Area: The End of the Feldstein-Horioka Puzzle?” Brookings Papers on Economic Activity, 2:2002, 147-186

Boldrin, Michele, and Fabio Canova (2001), “Inequality and Convergence in Europe’s Regions: Reconsidering European Regional Policies” Economic Policy 16 (32), 205-53

Burda, Michael C. and Jennifer Hunt (2001) “From Reunification to Economic Integration: Productivity and the labor market in Eastern Germany” Brookings Papers on Economic Activity, 2:2001, 1:92

Campbell, John Y. and Angus Deaton (1989) “Why is Consumption so Smooth?” Review of Economic Studies 56, 357-353

Carlin, Wendy and David Soskice (2009) “German economic performance: disentangling the role of supply-side reforms, macroeconomic policy and coordinated economy institutions” Socio-economic Review 7:1 67-99

Caselli, Francesco, Gerardo Esquivel and Fernando Lefort (1996) "Reopening the Convergence Debate: A New Look at Cross-Country Growth Empirics" Journal of Economic Growth 1:3, 363-89

Chen, Ruo, Gian Maria Milesi Ferretti, and Thierry Tressel (2012) “External Imbalances in the Euro area” IMF wp/12/236

De La Fuente, Angel (1997) “The Empirics of Growth and Convergence: A Selective Review” Journal of Economic Dynamics and Control 21, 23–73

De La Fuente, Angel (2002) “On the Sources of Convergence: A close look at the Spanish regions” European Economic Review 46, 569-599

den Haan, Wouter J. (1995) “Convergence in Stochastic Growth Models: The importance of understanding why income levels differ” Journal of Monetary Economics 35:1, 65–82

Esping-Andersen, Gøsta (1990), The Three Worlds of Welfare Capitalism, Polity Press

European Commission (2004) “Catching-up, Growth and Convergence of the New Member States” The EU Economy 2004 review, European Economy 06, Chapter 2, Luxembourg

Farhi, Emmanuel and Ivan Werning (2012) “Fiscal Unions” MIT Department of Economics Working Paper No. 12-20

Feenstra, Robert C. and Gordon H. Hanson (2001) “Global Production Sharing and Rising Inequality: A Survey of Trade and Wages” NBER WP 8372

Giavazzi, Francesco and Luigi Spaventa (2010) “Why the Current Account May Matter in a Monetary Union” CEPR DP 8008

González-Rozada, Martin, and Eduardo Levy Yeyati (2008) “Global Factors and Emerging Market Spreads” Economic Journal 118, 1917–1936

Guneven, Fatih (2007) “Learning Your Earning: Are Labor Income Shocks Really Very Persistent?” American Economic Review 97: 3 687-712

Hall, Robert E. and Charles I. Jones (1999) “Why Do Some Countries Produce So Much More Output per Worker than Others” Quarterly Journal of Economics 114:1, 83-116

International Monetary Fund (2003), Chapter III: Growth and Institutions, 95-128, World Economic Outlook 2003, Washington DC

Islam, Nazrul (2003) “What Have We Learnt From The Convergence Debate?” Journal of Economic Surveys 17: 3 309-362

Jappelli, Tullio and Marco Pagano (2010) "Financial Market Integration under EMU" pp. 315-353 in The Euro: The First Decade, M.Buti, S.Deroose, V.Gaspar, J. Nogueira Martins (eds.), Cambridge University Press

Jappelli, Tullio and Luigi Pistaferri (2011) “Financial Integration and Consumption Smoothing” Economic Journal 121, 678-706

Keen, Michael, and Kai A. Konrad (2012) “International Tax Competition and Coordination” Max Planck Institute for Tax Law and Public Finance WP 2012-06

MacLeod, W. Bentley (2013) “On Economics: A Review of Why Nations Fail by D. Acemoglu and J. Robinson and Pillars of Prosperity by T. Besley and T. Persson” Journal of Economic Literature 51:1 116-43

Obstfeld, Maurice, and Kenneth Rogoff (1995) “The Intertemporal Approach to the Current Account” in G.Grossman and K.Rogoff (eds.) Handbook of International Economics, vol.III, Elsevier, 1731-1799

Parente, Stephen L. and Edward C. Prescott (1994) “Barriers to Technology Adoption and Development” Journal of Political Economy 102:2 298-321

Rinne, Ulf, and Klaus F. Zimmermann (2012) “Another Economic Miracle? The German labor market and the Great Recession” IZA Journal of Laor Policy 1:3, 1-21

Rivera-Batiz, Luis A. and Paul M. Romer (1991) “Economic Integration and Endogenous Growth” Quarterly Journal of Economics 106, 531-555

Rodrik, Dani, Armind Subramanian, and Francesco Trebbi (2004). “Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development” Journal of Economic Growth. 9:2, 131-165

Sala-i-Martin, Xavier (1996) “Regional cohesion: Evidence and theories of regional growth and convergence” European Economic Review 40:6, 1325-1352

Sapir, André (2011) “European Integration at the Crossroads: A Review Essay on the 50th Anniversary of Bela Balassa’s Theory of Economic Integration” Journal of Economic Literature 49:4, 1200–1229

Sapir, André, Philippe Aghion, Giuseppe Bertola, Martin Hellwig, Jean Pisani-Ferry, Dariusz Rosati, José Viñals, Helen Wallace, and others (2004) An Agenda for a Growing Europe - The Sapir Report, Oxford University Press

Sørensen, Bent E. and Oved Yosha (1998), "International risk sharing and European monetary unification" Journal of International Economics 45:2 211–238

Stulz, René M. (2005) "The Limits of Financial Globalization" Journal of Finance 60:4, 1595-1638

Verdier, Geneviève (2008) "What drives long-term capital flows? A theoretical and empirical investigation" Journal of International Economics 74:1 120–142

Wilson, John D. (1999) "Theories of Tax Competition" National Tax Journal 52:2 269-304

KC-AI-13-490-EN-N