Governance Structures in Europe

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Governance Structures in Europe

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Contents

Figures

Executive Summary

The European economic crisis has brought to light that existing governance structures and institutions in Europe exhibit a number of substantial shortcomings. Some aspects of these governance structures have to be revised and adjusted in order to make the European Union more resilient to shocks, more sustainable in terms of public finances, and more flexible for adapting to challenges.

The policy report summarizes and connects the findings of six Working Papers (milestones) which have been prepared during the analytic phase for Area 4 of the WWWforEurope project. It is structured along Working Paper Thillaye (2013) which is a paper that takes a broad perspective on existing governance structures and institutions at the European level. It essentially deals with the functioning and efficiency of the Europe 2020 strategy, and its interdependency with the European Semester and the different methods and procedures related to it. The findings of Busl and Seymen (2013), Sachs and Schleer (2013), Busl and Kappler (2013), Rozmahel et al. (2013), and van Aarle (2013) are then integrated in this broad perspective.

The findings imply that current European governance suffers from a weak link between short-term and long-term goals. More precisely, the long-term objectives formulated in the Europe 2020 strategy are not adequately considered in the procedures and methods leading to country-specific reform recommendations within the European Semester. Furthermore, the rather high level of economic and political heterogeneity in the EU calls into question the economic harmonization pursued by the Europe 2020 strategy. Harmonization is thereby defined as a process of striving towards certain procedural rules and mechanisms in the member states. Such a strict focus on target indicators and rules leads to an inflexible procedure- and rule-based approach to governance. As a solution, a more efficient coordination of macroeconomic policies on a supranational level is suggested, where views and opinions of national stakeholders are given a higher weight and where governance does not follow a one-size-fits-all approach. The need for such a careful evaluation of national requirements, the formulation of country-specific reform recommendations and the related (supra)national consequences of such reforms is highlighted by Busl and Seymen (2013) and Sachs and Schleer (2013) which deal with national and supranational effects of national labour market reforms. It is shown that identical reforms can have substantially different effects across countries, and that the impact of reforms is not limited to the domestic level, but spillovers are likely which emerge through trade or financial market channels.

The next phase of the project, the policy formulation phase, will take up the findings of the different Working Papers and integrate them in the further work plan. More concretely, it will be analysed which national or supranational policies should be carried out in order to increase harmonization, what consequences a potential Eurozone enlargement would have for EU governance, and whether EU governance should move towards more integration and harmonization.

Introduction

The European economic crisis has brought to light that existing governance structures and institutions in Europe exhibit a number of substantial shortcomings. Some aspects of these governance structures have to be revised and adjusted in order to make the European Union more resilient to shocks, more sustainable in terms of public finances, and more flexible for adapting to challenges. Within the WWWforEurope project, Area 4 (Governance Structures and Institutions at the European Level) focuses on issues of the European policies and governance initiatives in the context of the new growth path and the requirements of a socio-ecological transition. Its research objectives are

- to identify the main inherent deficiencies in the EU and the related bottlenecks on the way to the new growth path;
- to analyse the link of these deficiencies to the governance structures and the institutions at the European level;
- to elaborate the changes in the European governance framework which are necessary for the transition to the new growth path.

Currently the European Union is an area with large disparities, structural differences in labour, product and financial markets, an incomplete integration and an asymmetric policy framework. This leads to deficiencies, which do not only limit economic and social development in Europe, but also seriously threaten the cohesion between member states and thus the participation of substantial parts of the population in the benefits of the project of European integration. EU policies and governance have struggled to prevent disparities from growing and to make convergence happen, both between and within member states. Furthermore, the large heterogeneities across member states make the European policy framework less effective.

A serious attempt to address these weaknesses, improve the governance structure and shape the socio-ecological transition is the Europe 2020 strategy. A change towards a new path of smart, sustainable and inclusive growth however needs substantial changes in the governance structure towards a more consistent and coordinated supranational macroeconomic governance system, supported by regional and national policies.[1] Changes in the monitoring structure and the transition towards a new growth path have to account for differences across regions and states of development.

The Area assesses the extent of disparities and heterogeneities across the EU, analyses the causes and implications of these internal problems and deals with the necessary changes in policies, governance initiatives and institutions at the European level, which are necessary for

[1] Coordination could take place either as a state-by-state approach or as an EU-wide approach. In general, both are interlinked since the former can be seen as a reduced form of the latter. Nevertheless, an EU-wide macroeconomic policy stance is often not realistic as the definition of a common economic policy which is supported by all member states is hard to achieve. Hence, in the following, only chapter 4 deals with an EU wide macroeconomic policy stance while the remaining parts mainly focus on the state-by-state approach.

the transition towards a new path of growth and social development. As discussed by Aiginger et al. (2012), a concentration on short-term crisis management is unavoidable in the current situation and will ensure the survival of the EMU on a five to ten year horizon. Nevertheless, a climate of fiscal austerity and increasing disparities will be the inevitable result and cripple the achievement of the objectives of the Europe 2020 agenda. In the medium to longer term, it will prove politically impossible to sustain EU integration without the adoption of successful policies and instruments of governance to promote faster innovation, more dynamic growth, and a more sustainable model of social and economic development, in the face of the triple challenges of globalisation, demography and climate change.

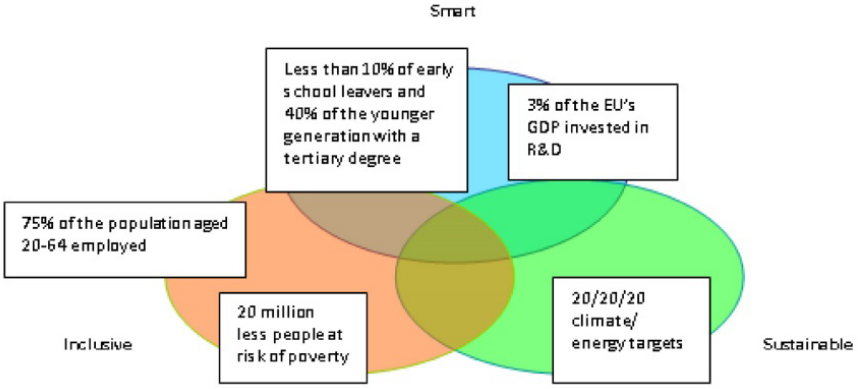
The aim of this policy report is to collect, summarize and assess the findings of research papers of Area 4 dealing with the aforementioned problems in various ways. Hence, this contribution serves as a framing of the research taken up to now and finalizes the *Analytic Work* phase in this Area. Consequently, it is a starting point for the next phase of the project which is the *Policy Formulation* phase. In turn, this policy report is not a summary of the existing literature on governance structures in Europe, nor is it dealing comprehensively with aspects related to governance and institutions in general. It is structured along Thillaye (2013) which is a paper that takes a broad perspective on existing governance structures and institutions at the European level. It essentially deals with the functioning and efficiency of the Europe 2020 strategy, and its interdependency with the European Semester and the different methods and procedures related to it. The findings of Busl and Seymen (2013), Sachs and Schleer (2013), Busl and Kappler (2013), Rozmahel et al. (2013), and van Aarle (2013) are then integrated in this broad perspective. When reasonable, it is cited directly from the paper which is summarized without stating the exact page.

The policy report is structured as follows: Section 1 discusses the Europe 2020 strategy and its interdependency with the European semester and the related procedures and methods. Section 2 presents the findings of Busl and Kappler (2013) and Rozmahel et al. (2013) which deal with the relevance of economic heterogeneity in the light of EU wide governance. Section 3 comprises the results of Busl and Seymen (2013) and Sachs and Schleer (2013). Both discuss the relevance of coordination of labour market reforms. The requirements for strengthening budgetary surveillance and fostering fiscal consolidation are discussed in section 4 which summarizes van Aarle (2013). A brief summary is given in a box at the end of sections 1, 2, 3, and 4. Section 5 concludes and provides an outlook for further research in this Area.

1. Europe 2020 and the European Semester

The Europe 2020 strategy is a long-term growth strategy for the European Union based on three pillars comprising of economic, social and environmental goals. The mutuality and complementarity between pillars and goals (or headline targets) are described in the following diagram:

Figure 1 **The structure of Europe 2020 objectives**



Source: Thillaye (2013).

Thillaye (2013) gives a critical overview of the three pillars of the Europe 2020 strategy. In general, the Europe 2020 strategy is assessed as an improvement in comparison to its predecessor, the Lisbon strategy, because of the balanced and consensual definition of long-term goals for the member states. However, the author emphasizes the problem of a capability-expectations gap, i.e., the existing governance structure may not be able to fulfil the expectations underlying the Europe 2020 strategy. The critique is structured along the three pillars of the strategy.

The paper identifies two main problems with respect to the first pillar (smart growth). First, "[t]he 3% research spending target and the building of an integrated European Research Area […] cannot really be enforced". Thus, while the EU can provide recommendations or foster the implementation of specific programmes, the achievement of the headline target remains in the responsibility of the individual states, although the European Commission can articulate policy warnings if the country-specific recommendations are not taken into consideration. Second, "[r]egarding education, the EU has only very limited clout". Similar to the first point, the EU is restricted to provide recommendations and to support the individual countries in their efforts to reach the levels of less than 10% early school leavers and more than 40% of the younger generation with a tertiary degree. In contrast to the research spending target, country-specific recommendations regarding education cannot lead to any formal warning. For both aspects, the EU is not equipped with means like, for instance, sanction options, to convince member states to fulfil the objectives.

Two out of three headline targets (reduce greenhouse gas emission by at least 20% compared to 1990s levels, increase the share of renewable energy to 20%) of the second pillar (sustainable growth) have already been tackled by the EU through acts like the Emission Trading Scheme (ETS) or the Renewable Energy Directive. The third target, increasing energy efficiency by 20%, is assumed to be reached through agreements on a supranational level. Thillaye (2013) therefore states that "the EU looks rather well-equipped to foster environmental policies within the member states".

The headline targets of the third pillar (inclusive growth) are an employment rate of at least 75% and to reduce the number of people living in poverty by 20 million. The influence of the EU on

national policies to reach these goals is limited. As Thillaye (2013) puts it, “the EU can coordinate member states’ employment and social policies, but it cannot adopt legislation”. Hence, comparable to the problems related to the first pillar, the Union is forced to rely on the national social policies.

A common problem of the Europe 2020 strategy in general is the limited financial leeway. On the one hand, the recent negotiations about the 2014-2020 multi-annual financial framework have entailed some improvements. Financial aid is more closely linked to achievements of the Europe 2020 targets, and is increasingly used as an instrument to support and complement private investment. On the other hand, “the distribution of EU competences is, by nature, not conducive to spending in areas such as education and social policy“, which are organized decentralized on the national level.

While being an important tool for supranationally influencing policies, the Europe 2020 strategy is complemented by various other EU Governance tools which have partly been installed or adjusted previously as a response to the sovereign debt crisis in the Eurozone. Basically, “the Commission’s line is precisely that they are mutually reinforcing”, in a way that “the fiscal and macroeconomic discipline required by EMU membership compels its members to enhance their long-term growth potential”. However, while this view might in some instances be correct, it cannot be avoided that governments are facing a trade-off between the goals of the different Governance procedures.

The revised Stability and Growth Pact (SGP) for fiscal stability, as well as the Macroeconomic Imbalance Procedure (MIP) and the Euro Plus Pact for competitiveness are integrated in the European Semester of policy coordination. Within this procedure, EU member countries have a reporting responsibility towards the EU which can apply different tools to ensure that countries remain financially stable and competitive. Within the European Semester, member countries are demanded to submit Stability and Convergence Programmes (according to the SGP) as well as National Reform Programmes (according to the MIP and to Guidelines which are closely related to the Europe 2020 strategy). Based on these programmes, the European Commission provides country-specific reform recommendations to its member states.

While the reforms of European governance and the implementation of the European Semester have equipped the EU with more efficient means to counter national excessive deficit or imbalance situations, such as the threat of more automatic sanctions, they at the same time imply the risk of neglecting long-term goals for the sake of short-term adjustments which serve immediate stabilization. As an example, wage-setting reforms associated with a drop in workers’ bargaining power have been recommended as a way to reduce labour costs and to improve competitiveness. This can on the one hand indeed reduce unemployment through increased labour demand in the short-term, but, on the other hand, foster inequality and raise the poverty risk in the long-run. According to a case study of country-specific recommendations and to interviews with practitioners, reaching the goals of the Europe 2020 strategy is in general not considered adequately when defining country-specific reform recommendations. Thillaye (2013) concludes that there is “a prioritisation of fiscal consolidation and short-term, market-based adjustment policies over the longer-term objectives pursued by the Europe 2020 strategy”.

To summarize, Thillaye (2013) states that the EU should try to explore "ways to deal better with the contradictions between short-term and long-term objectives". This could be done by, for instance, taking into account a long-term perspective in country-specific recommendations with the primary target of stabilization, and by exploiting resources of EU funds for implementing the recommendations. Furthermore, the European Semester procedure would benefit from an increase in interaction between national parliaments, social partners and EU institutions when it comes to discuss and determine reform programmes, "thus transforming the European Semester into a high-level political debate going beyond technocratic governance". Currently, reform recommendations tend to be focused too much on fiscal consolidation and improving competitiveness while neglecting social imbalances as well as spillovers to other EU member states through national reforms.

2. Heterogeneity in the EU

The previous section emphasizes the improvements of European governance structures through institutional reforms, but also its flaws, limits and conflicts especially in the light of strong economic heterogeneity across EU member countries.[2] One of the reasons for the focussing on short-term goals is the high level of economic heterogeneity in the EU leading to an asymmetric policy framework. In the following, it is discussed why existing governance structures became less efficient through the integration of Central and Eastern European countries (CEECs)[3] and the enlargement of the EU. In this respect, Rozmahel et al. (2013) analyse the current level of heterogeneity in the EU and discuss the role of CEECs to its formation.

First, it is outlined that reducing heterogeneity and achieving a high level of homogeneity in the European Union is consistent with the goals of existing governance structures in Europe. For instance, "the recently adopted legislations on the Macroeconomic Imbalance Procedure (MIP), the Fiscal Compact presented in the Treaty on Stability, Coordination and Governance (TSCG) or the Euro Plus Pact are based on the assumption of higher structural similarity within the EU, since the introduction of these procedures and treaties aims to support the convergence of individual economies to reduce national deviations". Similarly, the explicit target of the Europe 2020 strategy is that European regions reach the same levels of economic, social and environmental development.

The first part of Rozmahel et al. (2013) deals with integration strategies of CEE countries in the light of EU enlargement. The integration strategies of CEE countries might differ due to distinct target systems like the Scandinavian welfare system or the Anglo-Saxon type market economy, or due to the transition approach (shock therapy versus gradual transition). The paper compares the transition strategies of CEE countries along the following dimensions: (i) political

[2] Besides the heterogeneity across countries, substantial heterogeneity within a country also can be often observed. This issue is not discussed in this report.

[3] Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia, Slovakia, Bulgaria, Croatia.

stability, (ii) formal (political) institutions, (iii) informal institutions, (iv) economic level, and (v) real prospect of accession to the European Union. Political stability is divided into non-elite political stability (negatively affected by violent coups, riots or civil wars) and elite political stability (negatively affected by government breakdowns or fragile governments). Formal institutions capture the nature of political and voting systems. Informal institutions cover "norms, habits, conventions, customs, traditions, taboos, values, ways of thinking, codes of behaviour and so on". Finally, with respect to economic level, reference is made to the initial level of economic development. Based on the integration strategy comparisons across CEE countries it is concluded that specific national policies during the transition process do not significantly influence the success of integration. Moreover, the authors "identify the level of (non-elite) political stability, quality of institutional framework, maturity and compatibility of informal institutions and initial economic level as the key determinants of the success of the transition and integration process in Central and Eastern Europe".

The second part of Rozmahel et al. (2013) deals with heterogeneity in the European Union and the role that CEE countries play for it. Heterogeneity within the EU is examined by means of cluster analysis which is applied to five dimensions. Each dimension comprises of 3 to 4 indicators given in the following:

1. **Institutions and Governance** (Political Stability and Absence of Violence, Property Rights, Business Freedom)
2. **Single Market and Openness** (Intra-European Trade, Grubel-Lloyd Index, Foreign Direct Investment Intensity, Labour Migration)
3. **Macroeconomic Policies** (Government Expenditure, Labour Tax Rate, Official Lending Rates, Money and Quasi Money (M2))
4. **Symmetry and Convergence** (Growth Business Cycles of GDP and Industrial Production, Price Index)
5. **Competitiveness** (Labour Productivity, Real Effective Exchange Rate, Education Level, R&D Expenditure)

The cluster analysis reveals that neither core EU countries nor CEE countries form homogeneous clusters across the five dimensions. Concerning the evolution of heterogeneity over time, the EU countries became on average more homogeneous from 2000 to 2011. This evolution is driven by increased homogeneity within the groups of core, periphery (Portugal, Italy, Greece and Spain) and CEE countries. Concerning the homogeneity between groups, convergence is observable especially for the dimension "Symmetry and Convergence". However, divergence is apparent for "Macroeconomic Policies" and, to a smaller extent, for "Single Market and Openness" since 2008. The level of heterogeneity in "Governance and Institutions" as well as "Competitiveness" is not increasing, but still high. Furthermore, the CEE countries contribute significantly to the level of heterogeneity of the European Union in all dimensions, and the relative contribution is comparable to that of periphery countries.

The described evolution points to a tenacious integration process in Europe. Rozmahel et al. (2013) therefore conclude with the opinion, that "the current hybrid state [(common monetary policy for the euro zone and strong economic interconnections on the one hand, substantial

differences in competitiveness and institutions as well as a decentralized fiscal policy on the other hand)] is not sustainable on a long-term perspective". The paper suggests two relevant directions to go: either to reduce the level of integration, or to intensify the level of policy coordination and, eventually, centralize institutions. Since welfare state models are distinct across Europe, harmonization is difficult to implement, and the authors prefer to improve "coordination and joint responsibility in the fiscal area, and more generally in terms of policies and institutions in the European Union".

A different perspective on the issue of heterogeneity is taken by Busl and Kappler (2013) which makes up this section. The focus of that study is mainly on Eurozone countries which constitute a common monetary area. A prerequisite for a successful monetary policy, which is able to stabilize inflation in its member countries with a one-size-fits-all interest rate, is a considerable degree of homogeneity of cyclical fluctuations in that area. As Busl and Kappler (2013) state, the relevance of business cycle synchronization "became especially evident in the light of the past years, when the heterogeneity in economic development between the countries in the Eurozone increased forcing the European Central Bank (ECB) to use country targeted policy measures in addition to the common interest rate."

In the extant economic literature, several determinants of business cycle synchronization between countries like, for instance, trade linkages or the similarity of the sectoral structure have been discussed. The authors extend this view on the impact of foreign direct investment (FDI). From a theoretical point of view, the connection between FDI and business cycle synchronization is not clear since "the sign of the relation may strongly depend on the type of shock" that triggers the business cycle. While, for instance, a negative productivity shock is likely to be linked to lower synchronization due to a resource shift to relatively more productive locations, a shock to the financial sector may enhance the convergence of business cycles through within-company cross-border financial support.

Busl and Kappler (2013) build upon the existing literature by improving the empirical model specification and relate a bilateral measure of business cycle synchronization to bivariate variables capturing the intensity of foreign direct investments, trade linkages and the similarity of the sectoral structure. The findings suggest "that policies to attract more FDI from abroad go, in general, hand in hand with an increased similarity of business cycles with these international partners". Consequently, the hypothesis that FDI-promoting policies could have detrimental effects on business cycle synchronisation is not confirmed empirically. Furthermore, higher similarity of sectoral structures across countries is also linked to more synchronized business cycles. As against previous studies the paper does not find any significant impact of stronger trade linkages on synchronicity. This result points to the importance of common shocks in driving the correlation between trade integration and business cycle correlation.

In a nutshell, Rozmahel et al. (2013) argue that different welfare state models cause a substantial level of heterogeneity in the European Union, which is further increased by the integration of CEE countries. This complicates the harmonization of economic conditions across countries pursued by the Europe 2020 strategy. The authors therefore recommend accepting a certain level of heterogeneity across countries. Governance in the EU should mainly be based

on more efficient coordination across countries and not on the attempt to strengthen the centralized character of the EU. In contrast, Busl and Kappler (2013) provide evidence that policies fostering especially FDI, but also the harmonization of sectoral structures in the EU could help to decrease the level of heterogeneity. However, the scope for reducing heterogeneity through the above mentioned policies seems limited.

3. Economic Governance: The Case of Labour Market Reforms

The previous sections have pointed to the relevance of more coordination of macroeconomic policies in the European Union. In this section, options for successful coordination of macroeconomic policies are given using labour market reforms as an example. As discussed in section 2, the European Semester comprises several governance tools. Some of these tools provide the framework for country-specific structural reform recommendations from the EU for the member countries in order to ensure a stable economic development and to avoid or reduce imbalances. The term "structural reform" is generally positively connotated since it implies an improvement of a currently inappropriate or unfavourable arrangement.[4] Regarding the detrimental labour market development in most countries of the European Union with (very) strong increases in unemployment as a consequence of the economic crisis, structural labour market reforms received particular attention from economists and policy makers, both on the national and EU level.

Busl and Seymen (2013) deal with the issue of labour market reforms by determining the labour market impact of several labour market reforms in a two-country dynamic stochastic general equilibrium (DSGE) modelling framework. The analysis focuses on three aspects:

- First, how do a domestic increase in the matching efficiency and a reduction in unemployment benefits affect the domestic economy?
- Second, do these domestic labour market reforms spill over to foreign labour markets?
- Third, what reform possibilities exist taking France as an example?

Concerning the first question, the domestic market is calibrated to German data in order to capture the impact of the Hartz reforms at the beginning of the century. An increase in the efficiency of matching vacant jobs with unemployed persons, which was at the heart of Hartz laws I-III, by 20% leads to a fall in unemployment (and to an increase in employment since unemployment is defined as (1-employment)) by 1.7 percentage points in the long run. Output similarly rises by almost 1%. Following the reform, workers reduce their average hours worked by 0.7%, while wages go up by 0.4%. All in all, total hours worked as well as total wage income increase due to the employment gain. An unemployment benefit reduction by approximately 10 percentage points, as introduced by Hartz IV, has similar labour market effects to the change

[4] It should be noted that the potential gain from structural reforms is a controversial issue. Such reforms might produce externalities which discriminate certain groups.

in the matching efficiency. Unemployment drops by 1.7 percentage points, average hours worked decline by 0.4% and output increases by 1.1%. The main difference relates to wages where the unemployment benefit reduction translates in a wage cut of 0.8%. The reason for the drop in wages is the worsened worker bargaining power through the deterioration of the outside option. Total hours worked as well as total wage income increase substantially, again because of the employment gain. Jointly raising the matching efficiency and reducing unemployment benefits roughly leads to the sum of the individual effects. All in all, these results suggest that the model is well-suited for the simulation of labour market reforms since "the model does a good job in explaining a large part of what happened in the German data".

The second question is whether domestic labour market reforms produce spillovers abroad. The model allows such spillovers through a change in relative prices and an international asset market. The reforms in Germany lead to a domestic output increase, "which induces a reduction in the relative price of the German good". The second country in the model is calibrated to French data. The selection of Germany and France for the simulations is made because of their position as the largest European economies, their contrasting labour market developments, and their strong economic interdependency with each other as well as with the rest of the world. The decline in the price of the German good following the labour market reform generates a surplus to be shared between French firms and workers. Thus, the French economy is positively affected by the German labour market reforms. This result is qualitatively in line with existing findings of both the theoretical and empirical literature. However, the spillover effect is rather small quantitatively. As the authors state, "the French employment hardly moves in the short run and increases negligibly by 0.02% in the long run after the German reforms".

The French economy is then taken as the example to demonstrate the opportunities to improve general economic conditions through labour market reforms. Busl and Seymen (2013) look at specific reforms outlined in the National Reform Programme (NRP) 2012 of France. The first reform relates to "improve the organization of the decision-making process of the Public Employment Service". The second reform is a decrease in employers' social security contribution financed through a consumption tax rise in order to improve competitiveness by lowering labour costs without detrimental budgetary effects. The authors simulate different combinations of the reform options mentioned above and determine the impact of these planned reforms on the French economy to be a decline in the unemployment rate between 0.6 and 1.75 percentage points. The authors conclude that "increasing matching efficiency through similar measures as in Germany and increasing the consumption tax in order to create room for further reducing employers' social security contributions might have significant positive effects on the overall macroeconomic performance in general and the unemployment rate in specific". An additional reduction in unemployment benefits of 4% suggests a potential for reducing unemployment between 0.5 and 2.3 percentage points. Output would rise between 0.8% and 2.0%.

The spillovers from labour market reforms in France to other countries are smaller than the ones generated by German reforms. The reason for this is the starting position with regard to economic performance of the particular reforming country in relation to the second country in

the model. Nevertheless, the findings of the study do “not imply beggar-thy-neighbour effects of reforming countries on their trading partners”.

Busl and Seymen (2013) provide a rationale for the implementation of specific labour market reforms to improve economic performance and, in particular, labour market performance. Similar to this, Sachs and Schleer (2013) deal with the aggregate labour market impact of reforms of various labour market policies. However, instead of analyzing potential international spillovers of such reforms, Sachs and Schleer (2013) focus on the relevance of the dependency of labour market reforms on the country-specific regulatory framework. From a theoretical point of view, such interdependencies between labour market policies are well-grounded. Thus, the labour market impact of a deregulatory labour market reform probably depends on the regulatory level of other labour market policies. An example for this is the “Flexicurity” framework in Denmark, where introducing an active labour market policy is particularly successful due to the existence of lax employment protection and generous unemployment benefits. Unfortunately, the theoretical literature is agnostic as to which specific policies interact, and empirical contributions fail to comprehensively model such interdependencies for technical reasons. The paper overcomes these problems by applying a model selection approach which allows the precise identification of relevant interdependencies between six policies: employment protection, unemployment benefits, labour taxation, bargaining coordination, bargaining power, and product market regulation. While only the first five factors are pure labour market policies, product market regulation is included as well. The literature identified it both as an important conditioning factor for the impact of labour market policies, and also as a relevant determinant for unemployment itself. The main innovation of the paper is to allow for higher-order interdependencies, that is, between more than two regulatory factors.

The findings of Sachs and Schleer (2013) emphasize the relevance of dependencies between different policies. In summary, seven interactions between policies are identified to have a significant interdependent impact on unemployment. Five of the six policies are relevant as conditioning factors; only product market regulation is not contained in the seven significant interaction terms. Furthermore, the findings emphasize the relevance of higher-order interdependencies. More specifically, the fourfold interaction between employment protection, unemployment benefits, labour taxes and bargaining coordination appear to be important for unemployment. Hence, the impact of a (de)regulation of one of the four factors depends crucially on the country-specific regulatory level of the other three factors. In other words, while, for instance, deregulating employment protection is beneficial for reducing unemployment in Italy, it exhibits detrimental labour market effects in France. This occurs due to the distinct regulatory levels of unemployment benefits, labour taxes, and bargaining coordination. This can be made clearer with an example. According to the findings of the paper, employment protection and unemployment benefits are substitutes. This leads to two potential flexicurity situations. First, labour market transition is high due to low employment protection. Labour market risk is reduced by providing financial support for unemployed workers through sufficient unemployment benefits. Hence, while the incentive to search for a job is not explicitly boosted, low employment protection makes it easy to return to the labour market. Second, unemployment benefits are low and people exhibit a high incentive to search for a job. If

employment protection was also low, this would substantially lower the workers' search intensity since the probability of getting dismissed is high, and workers' bargaining power is low. With high employment protection, however, unemployed have an additional incentive to look for a job which is sufficiently protected. Hence, both situations can be beneficial in a sense that unemployment is low while (de)regulating both factors would lead to less favourable labour market outcomes.

By constructing country groups, the study identifies a large potential to reduce unemployment through deregulating reforms in Eastern-European, Southern-European and Middle-European countries, while deregulation is less likely to be successful in Anglo-Saxon and Scandinavian countries. Overall, "especially reductions in labour taxes, bargaining power, product market regulation, and bargaining coordination seem to be unemployment-reducing in the majority of countries. In contrast, lowering employment protection and unemployment benefits are much less likely to have the trivially expected consequences that deregulation is the road to success, although such reforms would be beneficial in some countries." According to Sachs and Schleer (2013), deregulating employment protection is linked to a reduction in unemployment in 7 countries (Austria, Belgium, Germany, Greece, Italy, Portugal, and Switzerland), while the same type of reform has adverse labour market effects in the remaining 19 countries. Similarly, reducing unemployment benefits is connected to a drop in unemployment in 9 countries, and to a rise in the remaining 17 countries in the sample. In economic terms, the findings are relevant, as well. For instance, a replacement rate reduction by 1 percentage point is related to a drop in unemployment by approximately 0.1 percentage points in the Czech Republic and to an increase in unemployment by 0.1 percentage points in Germany. Similarly, changing the tax burden by 1 percentage point affects unemployment in the same dimension. Somehow less reliable are the quantitative findings for employment protection and bargaining coordination due to the crude indicator construction. Nevertheless, the findings indicate substantial labour market effects through reforms in these categories. Additionally, Sachs and Schleer (2013) show that labour market reforms affect distinct groups in the labour market differently. More concretely, the findings reveal that reforms exhibit a gender-specific impact, a finding which is consistent with the literature. Hence, a reform can have important distributional effects which should be taken into account when setting up a reform plan.

Summing up, Busl and Seymen (2013) reveal that specific labour market reforms have the potential to improve economic conditions substantially, especially in countries exhibiting enough room for deregulation. Spillovers of such reforms seem to play a minor role as the spillover effects are quantitatively rather small and positive. Sachs and Schleer (2013) further emphasize the relevance of deregulatory labour market reforms for fostering labour market performance. Nevertheless, the dependency of the reform impact on the country-specific regulatory framework is pointed out. Hence, the success of a particular labour market reform is not ensured across countries, but depends on the specific national situation. Both papers thus provide options for the improvement of policy coordination by helping to make country-specific reform recommendations more powerful.

4. Budgetary Surveillance and Fiscal Consolidation

Section 2 pointed out that various governance tools like the MIP, the Euro Plus Pact or the revised SGP complement the Europe 2020 strategy. These tools serve, inter alia, to guarantee fiscal stability and to avoid excessive imbalances in the European Union and in the Eurozone. Since policy decisions affecting budgets are decentralized on the national level, a strong and efficient European-wide governance system requires methods and procedures to ensure that national and common objectives are not conflictive. Van Aarle (2013) takes up this issue and discusses recently introduced instruments in the budgetary governance framework. It is called into question whether the recent reforms related to the budgetary governance framework reach far enough to make current budgetary governance a well-suited framework leading to fiscal consolidation and sound fiscal policies in all EU member states.

More precisely, reforms to the Excessive Deficit Procedure (EDP), which is the core of budgetary governance, comprise sanctions to the preventive part of the SGP, newly introduced limits to structural deficits and a general rule of the speed of debt reduction, or the surveillance extension to macroeconomic indicators under the MIP with the possibility of sanctions and early warnings. Following the literature, van Aarle (2013) highlights four shortcomings of these reforms to the EDP: "(i) the EDP is pretty much a *black box* for both the general public and policy makers alike, (ii) there is no *coordination* of national consolidation efforts, (iii) the SGP does not spell out mechanisms for *mutual support* and (iv) there is no mechanism for *government insolvency*".

The paper makes proposals as to how budgetary governance could be reformed to a more efficient governance tool. More concretely, insights from four concepts, (i) fiscal federalism, (ii) multi-level governance and open coordination, (iii) hierarchical control, and (iv) a macro-finance perspective on budgetary governance are set in relation to the current budgetary governance framework, and potential adjustments are discussed. An essential improvement of these approaches is that they are more closely linked to the actual budgeting process of different government layers.

In terms of the EU, fiscal federalism means that "a matter ought to be handled by the smallest, lowest or least centralized authority capable of addressing that matter effectively" where actors are limited by a "constitutional constraint that the central government policies be decided by an elected or appointed 'central planner'". Since budget decisions are made at different levels of centralization, "a fiscal federation is characterized by a (latent) need for significant *intergovernmental grants* – i.e. transfers – to close revenue gaps left as a result of the efficiency -, equity – and stabilisation functions". In other words, fiscal federalism means that the central government needs to redistribute fiscal revenues to the national, regional and local governments. Following this point, the concept of fiscal federalism is applied to the case of Eurobonds. If the risk premia for some EU member states are not justified by objective evaluations (but by speculation instead) Eurobonds "could provide a straightforward exit from bond market turmoil in the euro area". Such intergovernmental transfers, as long as being subject to certain conditions and constraints, fit well into the concept of fiscal federalism. Two advantages can be expected from

the introduction of Eurobonds. First, a short-term financial market stabilization, and second, a medium-term integration of euro area bond markets leading to risk-sharing and fiscal discipline.

The second concept is multi-level governance and open coordination. Multi-level governance is in some way closely related to fiscal federalism as it can be defined as "a system of continuous negotiation among nested governments at several territorial tiers –supranational, national, regional, and local- as a result of a broad process of institutional creation and decisional allocation". As long as the efficiency of EU mulit-level governance is not limited by "over-complexity, blurring of responsibilities and the danger of stalemates with increasing number of veto points…", it can be a valuable policy-making tool. This is, for instance, underlined by changing nature of redistribution within the EU which moved from the centralized unspecific distribution of grants to a more regional perspective where specific clusters, industries or concepts are promoted, and where decisions are made at a rather decentralized level. A stronger role of multi-level governance with a focus on budgetary issues could help to commit EU member states to sound public finances. The open method of coordination is instead based on "the exchange of experiences and best practices" between regions or states. In this concept, the EU is an actor who organizes the process of coordination by providing benchmarks, best practices or recommendations, while national policies are allowed to differ in general. Country-specific reform recommendations within the European Semester can be interpreted as a coordination tool.

According to the third concept, hierarchical control, budgetary governance should "recognize the essentially network-based character of budgetary management in a supranational setting with 27 highly integrated member states". The network consists of the local, regional and national budgets which influence each other. These different layers are controlled by policy-makers who are subject to objectives, constraints and "requirements imposed by higher-level hierarchies". Such a hierarchical system can be managed similar to a physical or technical system, where the controllers "remain in control of all systems not only under small disturbances where the systems behave in approximately linear manner but also in the presence of larger disturbances where nonlinearities may start to drive the system". The application of such a hierarchical approach has the advantage that automated control systems can be derived from system theory and applied to budgetary governance. Different methods like Signal-flow graphs, Impulse-response functions or a state space representation of the system help the policy-makers to evaluate the performance of the system and to identify problems at an early stage.

The last concept refers to a macro-finance perspective on budgetary governance. The economic crisis has revealed that shocks hit countries differently and spill over through various channels. Van Aarle (2013) therefore advocates for a "methodological toolbox which can be used to analyse and compare the impact of actual as well as potential macroeconomic shocks in various EU member states, in the context of the current financial, budgetary and economic turbulence". Such a toolbox should comprise of five aspects: First, it should take a supranational perspective, not a country-specific one. This helps to take into account that supranational policy should not focus on national problems. Second, the distinction between shocks and the transmission of shocks should be feasible in order to distinguish between cause and effect. Third, real and financial spillovers should be taken into account for predicting how shocks

spread across countries. Fourth, stress-testing methodologies and early warning systems should be contained in the toolbox. The potential risk and consequences of stress in the financial sector as well as the real economy can then be better identified. Fifth, country-specific macroeconomic factors like the regulatory labour or product market framework, financial cross-border flows, fiscal policy, or public debt which affect the resilience of a country and its capacity to absorb shocks should be continuously and comprehensively controlled.

Van Aarle (2013) argues that the existing EU budgetary governance framework is not adequately equipped to achieve fiscal consolidation of the member states, and to allow the surveillance of national budgetary actions. Four concepts are described which may help to improve the clout of budgetary governance. Fiscal federalism, multi-level governance and open coordination, hierarchical control systems, and a macro-finance perspective on budgetary governance have in common, that they "could contribute to transform budgetary governance in the euro area from the current ad-hoc-, procedural-, indicator- and rule-based approach to a integrative, process-oriented, diagnostic and self-correcting framework".

5. Summary and Outlook

A key shortcoming of the existing EU governance structure is the weak link between short-term and long-term goals and the insufficient consideration of the goals of the Europe 2020 strategy in short-term oriented actions like the country-specific reform recommendations. More specifically, while the Europe 2020 strategy provides a reasonable framework for long-term achievements, concrete policy recommendations within the European Semester mainly focus on short-term adjustments to improve fiscal positions and competitiveness. Without the proper consideration of long-term objectives in the European Semester procedures, the Europe 2020 strategy runs the risk of losing its relevance as a long-term vision for the European Union.

The goals of the Europe 2020 strategy in principle aim at reaching a high level of harmonization concerning economic conditions across EU member countries. The objectives are set in absolute values and do not allow for relative positions. However, as pointed out in Rozmahel et al. (2013), the level of heterogeneity in terms of economic and political dimensions is rather high. Different welfare state models and economic developments avoid such a harmonization. It is therefore questionable how the long-term goals provided by the Europe 2020 strategy can be reached. Even if certain country-specific policies like, for instance, ones that induce FDI integration, help to reduce heterogeneity, it is likely that the scope of such policies is limited. This additionally entails the problem of the adequate implementation of a common monetary policy in the European Monetary Union (EMU). As a solution, a stronger coordinative role of supranational institutions as well as joint responsibility of the EU member states is demanded.

Besides providing a long-term vision, the EU aims to improve economic conditions and to reduce economic imbalances in the EU member states through country-specific reform recommendations within the European Semester. Thillaye (2013) argues that these reform recommendations are too much focused on "fiscal consolidation and short-term market based adjustments". Van Aarle (2013) further states that existing budgetary governance is not capable

to ensure that objectives of reducing debts and ensuring fiscal consolidation are reached. Four concepts are presented which have in common that budgetary governance should be made more flexible and process-oriented instead of being procedural and rule based. Busl and Seymen (2013) provide some evidence of labour market reforms which are able to improve economic conditions without stressing public budgets. More concretely, financing reforms which increase the matching efficiency by consumption tax increases are worth considering. The relevance of joint labour market reforms is further emphasized by Sachs and Schleer (2013). Combining the "right" reforms could lead to a larger gain in terms of unemployment reduction than individual reforms. Nevertheless, the same reform or reform package may not produce the same outcome for different labour market groups and in different countries. The country-specific regulatory framework and distributional consequences need to be taken into account when providing reform recommendations. Furthermore, national reforms can produce international spillovers. Hence, national policies can affect economic conditions abroad, thus hampering harmonization in the EU. While Busl and Seymen (2013) show that such spillovers are rather small for specific labour market reforms, they could be more substantial for other types of reforms. As argued by Thillaye (2013), "[n]ational parliaments and social partners should be involved as early as possible in the discussion of Annual Growth surveys and National Reform Programmes" in order to transform "the European Semester into a high-level political debate going beyond technocratic governance".

The key problems which need to be solved to improve EU governance are the following:

- The **influence of EU governance on national policies** is limited due to missing or weak warning and sanction mechanisms;
- **Long-term objectives** are not adequately incorporated into **short-term policies;**
- Given the rather high level of heterogeneity in the EU, the concept of **identical long-term objectives** for all countries is questionable;
- **National and supranational consequences** of national policies are at the moment not properly considered in the country-specific reform recommendations provided within the European Semester.

The on-going work in Area 4 will draw upon the findings of the analytic phase in the following ways:

- Which national or supranational policies could lead to a more **efficient harmonization** of economic conditions across EU member states? Should such policies be **supranationally organized**, and if so, how could this be implemented in existing governance structures? The first question will be tackled in work package 401 and the second in work package 401 and work package 404.
- How can existing governance structures deal with the **different state of integration** of CEE countries? Some of them are already EMU members while others are not. What means a **further enlargement of the EU** for existing governance structures and their effectiveness in the light of rising heterogeneity, and in what way should these structures be adjusted? Results can be further applied to the general issue of insider-outsider

constellations in the EU and will be produced and discussed in work package 403 and work package 404.

- Should the EU in general pursue the way towards **more harmonization and homogeneity** or should it accept that the scope for harmonization is limited, and adjust existing governance accordingly? What concrete **adjustments of governance structures and institutions** could facilitate both running a monetary union as well as a union with limited legitimacy to conduct macroeconomic policies on a supranational level? How can **distributional issues** be taken into account? How should a **long-term vision** for the EU look like, and how can the EU **combine short-term and long-term goals** more efficiently? These points will be taken up mainly in work package 404.

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Annex I: WWWforEurope Working Papers

The challenges of EU governance and the quest for long-term growth

Working Paper no 4

Author: Renaud Thillaye (Policy Network)

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The challenges of EU governance and the quest for long-term growth

Renaud Thillaye*

Introduction

Under the shadow of the euro area debt crisis and the poor economic climate prevailing in Europe, deep disagreements and divergent visions of what the EU should be about have surfaced again. For some, this is a federalist moment for a core of EU countries, who should commit to greater sovereignty transfers and resource-pooling at Community level, and resolutely envisage the future together. For others, this is a repatriation moment and a time to recover national sovereignty. A lot of people have been calling for yet another grand bargain, although for disparate reasons that can hardly be reconciled.

An alternative view is to consider that both sides, despite their respective rationales, have been distracting attention from the real challenges. If anything, the crisis demonstrated that many growth models in Europe were unfit for a globalised age and that markets should not be given too much leeway in destabilising a highly interdependent region such as the EU. The far-reaching changes in economic governance undergone in the last three years aimed precisely at tackling these weaknesses and at making a coordinated move towards more resilient growth models. Institutional innovation took place at a sustained pace. With the European Semester, the EU has engaged in much closer monitoring of national policies beyond a simple regime of nominal rules and remote sanctions. A greater sense of prioritisation has also characterised the launch of the Europe 2020 Strategy and the debate about the Multiannual Financial Framework 2014-2020.

More attention should be focused on how reformed economic governance performs since the scope for further major institutional shifts seems rather limited. At a time when the EU's legitimacy and that of public institutions in general have reached record low levels, there is a strong case for analysing the impact of EU governance, identifying its untapped potential and trying hard to improve its flaws and unnecessary costs. This paper asks whether Europe 2020 and the European Semester represent a qualitative difference from past EU economic governance. To put it bluntly, do EU member states need this web of rules, commitments and processes to live successfully together in the 21st century? Under which conditions, if any, can they reap the benefits from EU economic governance?

This paper rests on the assumption that European economies do not only need stabilisation; they also have to make resolute moves towards more sustainable growth models. When debating the means of EU governance, policymakers should not lose sight of the ends. As Aiginger et al. (2012) put it, a long-term vision for Europe should encompass:

- A higher quality of life and social inclusion for its citizens;
- Economies driven by innovation and strong human capital;
- An ecologically sustainable and financially more stable production model;
- Reduced welfare gaps across countries and individuals - without hampering diversity;
- A stronger European voice in world markets and institutions.

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This paper assesses in three sections the opportunities and challenges raised by the new EU governance system in the quest for long-term growth. It begins with a brief analysis of 'governance' used in an EU context and the questions raised by the EU's institutional innovations (1). The second section assesses the goals, the processes and the financial instruments underpinning the Europe 2020 Strategy, bearing in mind the limits encountered by the Lisbon Strategy during the last decade (2). A third section examines the way in which Europe 2020 cohabits with other frameworks of surveillance within the European Semester, and the results this combination produces (3).

Overall, the paper argues that EU economic governance balances various objectives rather well on paper, and that it is better equipped today to bring about policy shifts in the member states. The Europe 2020 Strategy sets the right long term vision for all, although there should be no illusion about national governments' responsibility for implementing it. Moreover, the incorporation of Europe 2020 into the European Semester has had mixed, if not detrimental, effects so far. Instead of representing a threat to long term objectives, the new architecture should be seized as an opportunity for a more intense and far-sighted discussion going beyond procedural monitoring. More debate is necessary about the impact of EU short-term adjustment guidelines on national growth potentials, and about the feedback loops between national policy-making and collective outcomes. This represents as much a policy as a political challenge, both in Brussels and in national capitals.

1. Questions of governance in a differentiated EU

How to understand governance?

Analysing of the promises and limits of EU policy-making today can gain from an insight into the existing literature about the concept of governance, and how it has been applied to the EU. In the wake of its popularisation by the World Bank in 1989, various definitions have been given and different uses have been made depending on the context. In political science, the term 'governance' has been used to describe the changing patterns of government, namely the importance of private actors and relevant networks in the making of public policies, and the use of soft-law instruments (Peters and Pierre, 2000).This approach suggests that governance equates to a less state-centric, less vertical form of government. A broader and more widespread definition is proposed by Keohane and Nye (2000) for which governance represents 'the processes and institutions, both formal and informal, that guide and restrain the collective activities of a group'. This understanding encompasses all forms of social interaction and can apply to the governing patterns of non-state actors from the local to the global level.

Analyses of governance have raised a number of questions for social students and practitioners in public institutions. Offe (2009), for instance, notes that governance is 'subject-less': instead of an accountable government, it leaves us with various actors and processes which are difficult to hold accountable. The optimistic view about governance suggests that it increases the 'problem-solving capacity' of public actors. However, 'actual power relations and dependencies' (p. 554) may not have disappeared. Moreover, by avoiding open political conflict and enabling technocratic bodies to design optimal solutions,

governance may lack the underpinning of a public debate or discourse. These observations lead to set the positive and supposedly neutral assumptions about governance aside, and to look at the actual effectiveness and the accountability of new governing patterns.

EU innovative governance

In European studies, the concept of governance has been applied for two decades to understand better the nature of the EU. Contrary to what was expected, the deepening of the Single Market, the launch of Economic and Monetary Union and the involvement of the EU in a much greater number of policy areas has not signalled an emerging European state. For the 'multi-level governance' theorists, the EU is neither an intergovernmental organisation, nor a state-like political system. It is a *sui generis* polity based on non-hierarchical decision-making (negotiation and deliberation rather than voting); the involvement of various public and private actors at different levels; limited spending capacity and a focus on regulatory policies (Marks et al., 1996; Jachtenfuchs, 2007).

Beyond traditional legislation and financing, the EU has, indeed, developed an impressive set of decision-making and implementation procedures. A whole spectrum of 'innovative modes of governance' are today in use in the EU (Tömmel and Verdun, 2008). Börzel (2007) finds for instance 10 modes of governance interacting with each other, such as supranational centralization, supranational joint decision-making, mutual recognition, intergovernmental cooperation, the Open Method of Coordination, delegated self-regulation and private interest government (Euro area voluntary agreements). EU treaties only partially recognise this diversity: articles 3 to 6 of the Treaty on the Functioning of the European Union (TFEU) establish a distinction between 'exclusive', 'shared', coordinated and optional competences. In practice, however, several modes of governance cut across a single competence.

The added-value of the EU's multi-level and multi-method governance is a matter of vivid debate in the academic and political spheres. If the EU can tax and spend, command and control, only to a limited extent, should it really be involved and limit member states' room for manoeuvre in so many policy areas? Political scientists generally observe that new modes of governance have been introduced precisely in these salient, 'market-correcting' policy areas, in which member states divergences are high and the 'hard-law' Community method had come to a deadlock (Kohler-Koch, Rittberger, 2006; Moravcsik, 2010). For some, this confirms that the EU is biased towards 'market-making' approaches and is limiting the problem-solving capacity of the state without replacing it (Scharpf, 2002). This diagnosis is not shared by all. Case-studies reveal that the intricate mix of soft and hard law mechanisms brings about various, and sometimes unexpected, outcomes (Tömmel and Verdun, 2008).

The literature on governance and the development of new modes of governance in the EU, therefore, raise three main interrelated questions:

- What is the actual policy direction of EU multi-level governance?
- How great is the effectiveness of its various policy-making procedures? What are their direct or indirect impacts on member states' domestic policies?
- Is the EU governance system democratically legitimate?

This paper focuses on the first two and applies them to EU economic governance. It rests on the assumption that the EU's legitimacy depends to a large extend on the first two dimensions ('output-oriented legitimacy') since there is no prospect of the EU political system getting closer to that of a democratic nation-state (Scharpf, 1999).

EU, EMU and the quest for a new growth model

The notion of economic governance, albeit commonly used, reflects different realities, the consistency of which can be questioned. It includes the institutions and processes designed to govern the Economic and Monetary Union, but it cannot be restricted to them. The Europe 2020 Strategy is a growth strategy for the 27 EU member states. Like its predecessor, the Lisbon Strategy, it spells out a supply-side agenda which all member states are supposed to implement with the EU's help. Hence EU economic governance is characterised by different perimeters and policy frameworks.

The consistency of the Lisbon agenda and the stabilisation rationale prevailing in the Euro Area was questioned during the last decade (for instance by Mabbett and Schelkle, 2007). Recent reforms of governance have made this question even more relevant, especially for Euro Area countries and for those which are committed to joining. Procedures such as the Stability and Growth Pact, the new Macroeconomic Imbalance Procedure and the Europe 2020 Strategy have been brought together into the European Semester. The recent changes have been primarily designed for EMU members and 'pre-in' countries. As Pisani-Ferry (2005, p. 8) puts it, 'the rationale for undertaking reforms jointly is in fact very weak for the EU *as a whole* while it is stronger *within the Eurozone*.' Most Lisbon-type reforms of social protection, taxation and labour law impact on individual countries competitiveness, hence also on the common monetary policy. Likewise, the case for coordinated pension reforms is strong given the risk of fiscal unsustainability in one country spilling over into others.

EU economic governance, thus, presents the picture of parallel and intense pressures on member states to address both short-term macroeconomic imbalances and long-term structural weaknesses, in particular for EMU members and 'pre-in' countries. Questionable is whether this reinforced set of rules and procedures works effectively for the long term. The past decade offers no successful template: on the one side, a loose regime of coordination and an impracticable sanction regime did not shield EMU from a financial 'perfect storm'. On the other side, the Lisbon Strategy lacked a convincing institutional underpinning. Against this background, the two main sections of this paper examine:

1) The direction in which Europe 2020 is pulling, and whether its processes and instruments ensure a higher rate of delivery than Lisbon.
2) The functioning the European Semester, and its impact on the Europe 2020 agenda.

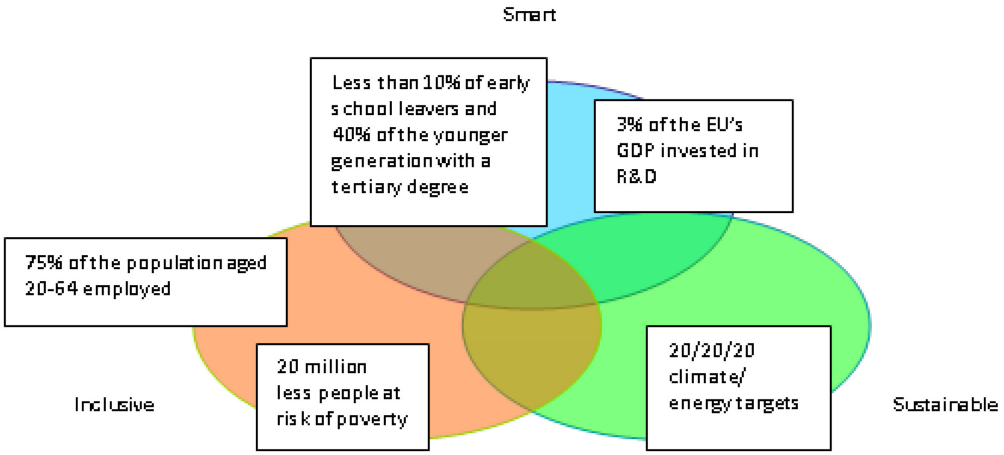
2. Europe 2020 and the socio-ecological transition: fit for purpose?

2.1 Europe 2020's toolbox for the 'new growth' agenda

In 2010, the Commission judged that the Lisbon Strategy had suffered from an 'overly complex structure with multiple goals and actions and an unclear division of responsibilities and tasks' (EC 2010a, p. 2). The focus on 'growth and jobs', and the introduction of country-specific recommendations, after the 2005 mid-term review, did not prevent a poor and uneven record. The ensuing analysis shows that the Europe 2020 Strategy strikes a good balance between economic, social and environmental objectives, but that it does not represent a sea change in terms of governance. Once again, it risks setting ambitions too high if member states do not implement it individually and collectively as a matter of priority.

Policy direction: the philosophy of Europe 2020

Europe 2020 is built upon three pillars and five 'headline targets' which are, by and large, in line with the socio-ecological transition. As the Commission puts it (EC 2010b, p. 8-9), the three priorities are 'mutually reinforcing' and 'offer a vision of Europe's social market economy for the 21st century': better education propels higher employment, which itself helps tackling poverty; investment in research and innovation increases the resilience of the economic system and is beneficial to employment in the long run.



At first glance, the consistency of Europe 2020 targets appears consensual. The targets constitute a significant yardstick to preventing national governments from sacrificing too much to short term politics (Atkinson, 2012). Policy-makers based in Brussels also think that Europe 2020 makes EU institutions more mindful of the long term (Interviews, Annex 5). Europe 2020 was signed off by a majority of right-wing governments, but left-wing and ecological forces can reclaim ownership. Arguably, it reflects the objectives enshrined in the EU Treaties, namely the vision of a 'social-market economy' promoting the 'well-being of its people', working for the 'sustainable development of Europe', pursuing 'economic, social and territorial cohesion' and fighting 'social exclusion' (Art. 3 TEU).

Inevitably, some authors criticise this consensual approach. Pro-market voices like Erixon (2010) think that any EU growth strategy should strictly focus on deepening the Single Market, the EU's *raison d'être*. He observes that Scandinavian countries are among the most open economies while at the same time performing the highest on social and environmental standards. This view is largely shared by Wyplosz (2010), according to whom competitive pressures from other EU member states and the rest of the world remain the most powerful drivers of reforms. At the other side of the spectrum, social policy experts criticise the 'inclusive growth' concept. For Daly (2012), this notion does not result in a coherent social development strategy. Peña-Casas (2012, p. 162) finds that cohesion and social inclusion are 'reduced to a basic function: to equip individuals with the ability to anticipate and manage change'. Finally, economists sensitive to political ecology are concerned that the EU does not prioritise public goods relevant to 'the well-being of populations' (Fitoussi and Laurent, 2009, p. 17-18). They warn against the dangers of peer-pressure and institutional Darwinism, and call for more cooperative approaches allowing greater investment in education and training, green technologies and infrastructure.

Hence, Europe 2020 inevitably suffers from the limits inherent in political compromise. In particular, it does not distinguish clearly what is left to competition from what requires public intervention. These pitfalls require extra attention, but they will probably not find any perfect solutions. It is largely up to political leaders and policy-makers to put more flesh on the broad socio-ecological direction suggested by the Europe 2020 Strategy.

Institutional processes: a patchwork of legal bases and methods

With Lisbon's flaws in mind, the Commission dedicated a whole section to 'governance' in the Europe 2020 Communication. It suggested that Europe 2020 represented an improvement in two main ways:

- By linking Community and national policies under a common thematic framework, namely seven 'flagship initiatives'.
- By placing the European Council in the driver's seat and increasing 'ex-ante' coordination (EC 2010b, p. 26-27).

We focus here on the first aspect and propose a critical overview of the 2020 pillars on account of the diverse modes of governance and legal imbalances cutting across them. The table in the annex (Annex 1) summarises the main elements of the seven flagship initiatives.

<u>Smart growth</u>

The 'smart growth' pillar looks to advancing the knowledge factor of European economies. It includes two targets on research and innovation (R&I) and education, and three flagship initiatives on innovation, the digital economy and youth. However, economic and education objectives do not rest on the same legal basis.

R&I and the digital economy correspond to shared competences between the EU and member states as provided for by Article 4 TFEU. EU law takes precedence over national law; binding measures can be imposed on national governments throughout the 'ordinary legislative procedure', i.e. the Community method; qualified majority voting applies. In the

communications detailing the ‘Innovation Union’ and ‘Digital agenda for Europe’ flagship initiatives, the Commission commits to make legislative proposals for an EU patent regime, greater standardisation in cutting-edge sectors, greater mobility of venture capital and better cross-border access to public procurement. To top the EU’s action up, member states are expected to boost the effectiveness of their R&I systems and their capacity to leverage private funding. Country-specific recommendations covering these areas are based on Guideline 4, which is part of the Broad Guidelines of Economic Policy (BGEP) under Article 121 TFEU. Concretely, member states are faced with the threat of policy warnings from the Commission; the Council can adopt recommendations on qualified majority voting.

The overall conducive decision-making suffers a significant caveat. The 3% research spending target and the building of an integrated European Research Area – one of the main objectives of the ‘Innovation Union’ initiative - cannot really be enforced. In the TFEU, research is classified as a shared competence with important qualifications: the Union is merely invited to ‘define and implement programmes’, and member states cannot be bound by EU legislation. The responsibility to better integrate national systems rests, therefore, on the member states’ shoulders, and the Commission merely plays the role of facilitator.

Regarding education, the EU has only very limited clout. Article 6 TFEU mentions ‘education, vocational training, youth and sport’ as a field in which the EU can only carry out actions to support, coordinate or supplement the actions of the Member States’. As a consequence, the flagship initiative ‘Youth on the move’ consists mainly in non-binding recommendations to member states such as ensuring ‘efficient investment in education and training systems at all levels’ and ‘reducing early school leaving’ (EC 2010b, p. 11). Member states are urged to put in place ‘youth guarantees’ ensuring ‘that all young people are in a job, further education or activation measures within four months of leaving school’ (EC 2010c, p. 33-38).

Country-specific recommendations are based on Guideline 9, which is part of the ‘Employment guidelines’ provided for by Article 148 TFEU. Contrary to the economic guidelines, they cannot lead to any formal warning or sanctions. The Open Method of Coordination applies and consists mainly of setting up benchmarks, identifying best practice and encouraging mutual learning. The Commission commits, for instance, to ‘set up the modernization agenda of higher education including by benchmarking university performance’. It also envisions ‘a systematic monitoring of the situation of young people not in employment, education or training’. It is then up to national governments to seize these exchange opportunities within the Council. The relative failure of this approach during the last decade casts a long shadow on the capacity of the EU to reach its education targets.

Sustainable growth

This pillar includes the 20/20/20 energy targets and two flagship initiatives: ‘Resource efficient Europe’ and ‘An industrial policy for the globalisation era’.

In the field of energy and environment, the EU has had the capacity to pass legislation since the Single European Act. According to Articles 191 to 194 TFEU, environment and energy

are submitted to the ordinary legislative procedure to the exception of fiscal matters. Two of the '20/20/20' targets enshrined in Europe 2020 originate from the Climate energy package adopted by EU leaders in 2007-2009. Key legislation was already passed in 2010, such as the Renewable Energy Directive (2009/28/EC) and the Emissions Trading Scheme (ETS, Directive 2009/29/EC). Each year, the ETS lowers the cap on CO2 emissions by power plants and energy-intensive industries so as to reach a 21% reduction from the 2005 level by 2020. To complement the ETS, Decision 406/2009/EC provides for national reduction targets in other sectors (agriculture, housing, waste and transport).

Only the target of 20% more energy efficiency was not formally part of the climate-energy package. This objective is central to the flagship initiative 'Resource efficient Europe', which contains other proposals, such as a more integrated energy market, the 'greening' of the Common Agriculture Policy and the revision of the Energy taxation directive. Except taxation, all of these measures would follow the ordinary legislative procedure and could lead to binding procedures. Nonetheless, more precise commitments, such as the removal of environmentally harmful subsidies and the use of market-based instruments (such as taxation and procurement) to foster change in production and consumption habits are left to member states' responsibility.

Overall, the EU looks rather well-equipped to foster environmental policies within the member states. The method of setting long-term targets and leaving it to the member states to decide on how to reach them has proved rather consensual.

Industrial policy suffers from much greater legal asymmetry between market-making and market-correcting measures. On the one side, the EU's exclusive competence for competition rules (Article 3 TFEU) and the strict supervision of state aid make it difficult for member states to adopt protective measures. On the other side, the competence for industrial policy remains national (Articles 6 and 173 TFEU). As a result, the EU cannot steer any sectoral development at EU level. The 'Industrial Policy' Communication (EC 2010d, p. 4) suggests 'bringing together a horizontal basis and sectoral application'. However, the sectors identified are mainly subject to enhanced dialogue and extra EU resources for research and innovation. Member states, in contrast, are urged to facilitate the restructuring of uncompetitive sectors. The Commission commits merely to 'launching a consultation of European social partners on a European framework for restructuring' (p. 21-22).

Inclusive growth

The third and last pillar covers the employment and poverty targets. Each one of them is underpinned by a flagship initiative. Policies pursued in these areas fall mainly under Article 5 TFEU. The EU can coordinate member states' employment and social policies, but it cannot adopt legislation. The 'Agenda for new skills and jobs' initiative mainly rests on non-binding roadmaps such as the Flexicurity Agenda initiated in 2008 and tools such as a 'European Skills, Competences and Occupations framework' (EC 2010b, p. 17). The 'European Platform against poverty and social exclusion' initiative must transform the open method of coordination on social exclusion and social protection into a 'platform for cooperation, peer review and best practice'. Recommendations can be addressed to

member states on the basis of Guidelines 7, 8 and 10 under Article 148 TFEU, but there is no follow up in terms of warnings and sanctions.

As it has long been observed (Scharpf, 2002), the Union has little grasp of member states' social policies. Although Social Policy in the TFEU is based on a broad objective of upward harmonisation of 'living and working conditions' (Article 151), the need to 'take into account the diverse forms of national practices' and to 'maintain the competitiveness of the Union' is a serious limitation. The union can adopt directives only when minimum requirements are necessary to the functioning of the Single Market (Article 4, Article 152). The Council can vote by qualified majority when dealing with working conditions at the workplace. However, unanimity applies to issues related to labour law, social security for the unemployed, and the rights of trade unions. The bulk of the Social Policy title is that the EU ensures a baseline of social protection, but does not actively pursue upward harmonisation.

As Vandenbroucke (2012) argues, the fears of social dumping expressed during the Rome treaty negotiations proved largely wrong as long as member states could compensate for a loss in competitiveness by bringing down their exchange rate. Yet, this option is not available anymore to most EU countries attached to the EMU regime. In this context, the absence of a more stringent coordination mechanism for wage and social policies can be seen as a problem for the achievement of the social and employment targets in the Euro Area.

Europe 2020 financial instruments: an increasing added value

All these legislative and procedural tools are supported by the EU budget. EU experts often insist on the regulatory nature of the EU and the limited, it not symbolic, size of its budget. The 2007-2013 budgetary commitments represented only 1.12% of the EU Gross National Income[1], while national public spending ranged from 35% to 57% of member states' GDPs in 2011[2]. Moreover, two-thirds of the budget is redistributed as direct aid to farmers and structural funds. A more nuanced assessment, however, is necessary. Substantial efforts have been made over recent years to increase the 'added value' of EU money.

First, there has been an incremental shift of focus from redistribution to long term investment. The agreement reached in 2005 for the 2007-2013 budgetary framework marked already an important increase in credits for infrastructure, research and innovation (Epha, 2006). The 2014-2020 Multi-annual financial framework adopted by EU leaders in February 2013 follows the same logic. The Commission explicitly linked its proposals to the achievement of Europe 2020 targets ('A budget for Europe 2020', EC 2011e). The Connecting Europe Facility is allocated €29 billion to finance transport, energy and broadband infrastructure, a 140% boost from 2007-2013. Funding for agriculture go down by 12% while credits for 'growth and jobs' rise by 38%. According to the summit's conclusions, 'the funding for Horizon 2020 and ERASMUS for all programmes will represent a real growth

[1]European Commission, 'Financial Framework 2007-2013, http://ec.europa.eu/budget/figures/fin_fwk0713/fwk0713_en.cfm#cf07_13 [accessed 15/02/2013]
[2]Eurostat, 'General government expenditure statistics' http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/General_government_expenditure_statistics [accessed 15/02/2013]

compared to 2013 level' (European Council 2013, p. 7). Finally 'climate action objectives will represent at least 20% of EU spending in the period 2014-2020' (p. 6), making EU structural funds and the direct payments conditional to 'green' practices or investments.

The second development consists in the ever expanding use of the EU budget as a leveraging instrument. This is true for structural funds, which 'account for a very significant proportion of public investment in Europe- more than half of it in several member states' (up to 90% in Hungary, EC 2012d, p. 2). Linkages between structural funding and the private sector have also been enhanced. Under the Competitiveness and Innovation Programme (future Programme for the Competitiveness of enterprises and SMEs), several financial instruments are dedicated to leveraging private investment such as the 'SME Guarantee Facility', which secured 190,000 loans between 2007 and 2011 (EC 2012g, p. 2). Other examples are the Risk Sharing Finance Facility and project bonds endowed with seed capital from the EU and European Investment Bank up and expected to leverage private investment for complex and long-term research, development and innovation projects.

For these reasons, the EU budget's role in implementing the Europe 2020 Strategy should not be underestimated, although the distribution of EU competences is, by nature, not conducive to spending in areas such as education and social policy.

2.2 Learning from two years of implementation (2011-2012)

How have Europe 2020's policy and institutional diversity, and the financial instruments attached to it, fared since 2010? Overall, implementation has been rather slow (see 'progress so far' in table, Annex 1). This comes down to three main explanations.

National interests and the narrow scope of 'hard law'

European decision making is slow and fraught with limitations even in the Community field. The Community method is no open sesame to making legislative breakthroughs and accelerating the implementation of Europe 2020. This has been visible on the economic front, where the last two years' limited legislative record contrasts with the ambitious rhetoric of the 2011 Single Market Act drawing on the Monti Report. It took three years of negotiation to adopt, on an enhanced cooperation basis, an EU patent regime which will hardly remove regulatory differences between countries (Economist, 2012). A new regulation on standardisation was passed by late 2012, with the aim of speeding up the use of standards in the services and digital sectors. Other measures such as a European venture capital regime, greater cross-border access to public procurement, and a harmonised regime of electronic signatures have only made slow progress since 2011.

Adopted legislation also tends to be watered down at implementation stage. The Commission finds for instance that member states have been slow to implement the Services Directive and the Second and Third Energy packages (EC 2011f, p. 15-18). The 'State of the Single Market' Report 2013 points to 'unjustified double regulation' and 'entry barriers' on the services sector of several member states (EC 2012l, p. 9). It also denounces national regulation of energy prices. The financial, digital and transport sectors are matters

of concern as well. All these policy areas are subject to political salience at national level, with vested interests directly threatened by deeper European integration.

The same can be said of the attempt to use market-based instruments in the field of climate change. On the one hand, Directive 2012/27/EU on Energy Efficiency represented an important step since it completed the climate-energy legislative arsenal. On the other hand, the EU has been struggling to price carbon emissions in the production and consumption processes. The Emissions Trading Scheme is failing to incite industrial companies to invest in cleaner solutions. The excess of credits available on the carbon market in a context of economic downturn has prompted the Commission to propose 'back-loading' allowances in order to push prices up. Yet this adjustment has met opposition from both the industrial sector and the centre-right group in the European Parliament (Euractiv 2012a). The adoption of the new Directive 2011 169/3 on Energy Taxation proposed by the Commission seems remote as well. A central provision consisting in aligning the light tax regime of diesel fuels with the one of other combustibles has triggered similar opposition (Euractiv, 2012b).

The limits of 'soft law'

The EU's record is difficult to evaluate in the fields of national competence, especially social and employment policies. The launch of Europe 2020 was followed by a series of action plans such as the Council recommendation on policies against early leaving from education and training and the Communication on the modernisation of higher education. The Employment and Social Affairs Council adopted in 2012 'social protection performance' and 'employment performance' monitors (Council, 2012d, p. 12). Most of these communications and benchmarks are subject to the Open Method of Coordination, namely low-profile dialogues between the Commission and member states, and between member states themselves. Policymakers based in Brussels admit that member states engage in these exercises to very patchy degrees. Countries like France and Germany are said to be much more active than Northern European countries, not so much for 'mutual leaning' purposes but rather to try to influence their peers (Interviews, Annex 5).

The absence of EU competence in the industrial field has also been deplored in several member states. The car industry overcapacity crisis, for instance, has found with only limited answers in Brussels. The 'Cars 2020 strategy' aims at establishing a level playing field for all car-makers, but it does not propel concentration nor avoid takeovers by extra-EU companies (Financial Times, 2012). In February 2013, Commissioner Tajani's call for Arcelor Mittal to stop cutting jobs and to wait for a sectoral EU plan was met with disdain by the steel multinational (New York Times, 2013). A few days earlier, EU leaders had agreed to slash the Globalisation Adjustment Fund down from € 3.5 to 1 billion in the 2014-2020 Financial Framework. Several member states had been campaigning to hand back to the national level the responsibility of dealing with the social aspects of industrial change (Euractiv, 2013). This highlighted the EU's weakness in managing the consequences of its 'hard law' of competition, and in enabling successfully the modernisation of strategic sectors.

The shadow of crisis in EMU

The severe economic conditions that have affected European economies in 2011 and 2012 have crippled delivery. Low growth and high levels of debt have left several countries suffering from deflation and a lack of investment. Very large adjustment needs mean that national targets on R&I spending, education and employment are under risk. In Spain, for instance, 'public investment has contracted by €17bn' since 2009 (Rubio-Ramirez, 2013). Although EU leaders stated in March 2012 that the targets remained 'fully relevant' (European Council, 2012), experts acknowledge that Europe 2020 has been delayed. A downward revision of the targets is not excluded in 2014 (Interviews, Annex 5).

Paradoxically, the crisis has partially improved the EU's energy records. As a high-level Commission expert recognises it, progress has been made towards emissions' and energy consumption's targets, however by accident. If growth comes back, there is a risk of moving backwards because of a lack investment in renewable energies and energy efficiency.

Finally, most member states are not on track of achieving their social and employment targets. As the Commission (EC, 2013) reported in January 2013, households' incomes have declined in several countries in the last five years. The risk of poverty and exclusion has increased. Growing divergence is pitting resilient countries against countries faced with a high level of long term unemployment. This led recently Commissioner Laszlo Andor to stress the need to 'find better macroeconomic stabilisation mechanisms in EMU and to better coordinate better social and employment policies'.[3]

The on-going debt and economic crisis, therefore, asks whether the EU is able to deal effectively with fiscal and competitiveness imbalances in a way which preserves human capital, maintains people out of poverty and advance a long term agenda altogether. This question is above all relevant for those countries in need of stabilisation. The next section examines how Europe 2020 has been connected to macroeconomic governance instruments within the European Semester. It asks whether EU governance offers any protective umbrella for countries urged to undertake market-based adjustments. Only in this light is it possible to draw a more general assessment of EU economic governance.

3. Europe 2020 in the new economic governance architecture

The banking and sovereign debt crises that EU member states have experienced since 2007-2008 have prompted a series of institutional reforms aimed at preventing the same scenario from happening again. These developments have been widely described and commented from a macroeconomic point of view. The way they impact on the long-term agenda of structural reforms has been less a matter of discussion.

Certainly, it is artificial to disentangle the two agendas. The Commission's line is precisely that they are mutually reinforcing. In too many countries, economic growth relied on credit-

[3] http://news.bbc.co.uk/democracylive/hi/europe/newsid_9782000/9782595.stm

and debt-driven consumption before the crisis, and not enough on productivity gains (EC 2010a, p. 4). Less public spending should go hand in hand with more competition; containing the cost of labour should be compensated by greater investment in research and innovation. In other words, the fiscal and macroeconomic discipline required by EMU membership compels its members to enhance their long-term growth potential.

This section challenges this reading by giving a detailed account of the European Semester. It provides an assessment of how the short- and the long-term agendas have been dealt with in parallel in the last two years (2011-2012) by looking, first, at legal overlaps between Europe 2020 and the new macroeconomic governance framework. Secondly, it compares the Annual Growth Surveys' content for 2011, 2012 and 2013. Finally, a case-study of three countries representative of different situations (Finland, France and Italy) provides insights into country-specific recommendations and National Reform Programmes.

3.1 Locating Europe 2020 in post-crisis EU governance

A new landscape of rules, commitments and surveillance frameworks

The table in Annex 3 provides an overview of the most significant governance changes intervened for EMU and 'pre-in' countries. Schematically, these reforms reinforce EU surveillance over member states in two directions: fiscal stability and competitiveness.

The fiscal pillar includes the Stability and Growth Pact (SGP) and the Treaty on Stability, Coordination and Governance (TSCG, in application since January 2013). Under the revamped SGP, deficit and debt reduction dynamics become prominent criteria in the decision to place a country under excessive deficit procedure. In the corrective phase, the Commission can propose sanctions which the Council can only oppose respectively by a simple and reversed qualified majority. The TSCG provides a parallel surveillance venue on an intergovernmental basis. It sets a cap of GDP 0.5% for the public deficit in structural terms (i.e. cycle-corrected). Signatories have to transpose this 'debt brake' into constitutional law or the equivalent lest they be sued by the Court of Justice.

The competitiveness pillar rests similarly on a Community and an intergovernmental leg. A 'Macroeconomic Imbalance Procedure' (MIP) based on Article 121.6 TFEU provides for an annual 'Alert Mechanism Report' assessing member states' macroeconomic robustness through a scoreboard of 11 indicators. The report leads the Commission to proceed to 'in-depth reviews' in some member states. Countries deemed to experience 'excessive imbalances' face the threat of binding recommendations and sanctions, for which reversed qualified majority voting applies. In parallel, the 'Euro Plus Pact' adopted in March 2011 committed its 24 signatories to very precise policy reforms in salient areas such as wage-setting, labour markets and pensions. The Commission was entrusted with monitoring its implementation. At the beginning of 2013, EU and member states officials continue to see it as a document of reference (Interviews, Annex 5). Many think that it prefigures the 'convergence and competitiveness agreements' proposed recently by J.M. Barroso and H. Van Rompuy in their roadmaps to complete EMU.

Procedural integration: the European Semester of coordination

Like Europe 2020, the SGP, the MIP and the Euro Plus Pact impose on member states to report progress to the Commission. The 'European Semester of coordination' was conceived to integrate these different frameworks and to allow a single set of consistent and visible recommendations. As the Commission puts it, the European Semester synchronises the assessment of fiscal and structural policies in order to 'bring the means and the aims together' (EC 2010b, p. 25). EU and permanent representations officials are generally convinced that the ES is a useful exercise in that respect (Interviews, Annex 5).

Though already experimented in 2011, the European Semester did not become reality in EU law before November 2011 (Regulation 1175/2011). It starts with the Annual Growth Survey (see timeline in Annex 2), initially due in January. Its release was moved to November in order to allow more time for debate in the Council and in the European Parliament, before the European Council endorses the Annual Growth Survey's priorities in March. In April, member states submit simultaneously their Stability or Convergence Programmes, which refer to fiscal obligations under the SGP (Article 126 TFEU); and their National Reform Programmes, based on the Broad Guidelines of Economic Policy (Article 121 TFEU) and the Employment Guidelines (Article 148 TFEU), both closely connected to the Europe 2020 Strategy. National Reform Programmes must also take the MIP guidelines into account. In May, the Commission issues Country-specific recommendations. They are discussed and adopted by the European Council in July.

As a result, and as the graph in Annex 2 illustrates, three different treaty bases are brought together into the European Semester. Failure to apply recommendations drawing on the Broad Guidelines can prompt a warning for any EU member state. However, failure to apply recommendations under the SGP and the MIP can lead to sanctions for euro area countries. Hence, country-specific recommendations have much more bite if they refer explicitly to the SGP and the MIP. Stability considerations are likely to take priority over Europe 2020 objectives when a country slides into an excessive *deficit* or *imbalance* situation.

Potential clashes between Europe 2020 and other commitments

There are several reasons to think that the European Semester represents as much an improvement as a threat for Europe 2020. For Armstrong (2012), the Strategy's integration into the ES potentially means its submission to short-term and stabilisation rationales.

On the competitiveness side, the wage-setting reforms and tax cuts on labour encouraged by the Euro Pact and the MIP possibly encroach on Europe 2020's social objectives. Although unemployment and low skills are by far the greatest poverty factors, income inequality, which has risen in the last three decades, means that working does not prevent people from slipping into poverty (OECD 2008).

EU fiscal rules threaten Europe 2020's targets in two potential ways. First, they constrains public expenditure whereas lifting people up from low skills' traps and improving 'non-price' competitiveness often require a high level of public spending. Whether governments can

consolidate their financial situations and increase the growth potential is a matter of debate (Alesina and Giavazzi, 2012; Van Reenen, 2012). Secondly, the impact of fiscal consolidation undertaken in several countries at the same time is overlooked. IMF experts recently admitted that 'forecasters significantly underestimated the increase in unemployment and the decline in domestic demand associated with fiscal consolidation' (Blanchard and Leigh 2013, p.5). In the Alert Mechanism Report 2013, the Commission recognised that 'the on-going adjustment to imbalances is necessary but is costly in the short term and has resulted in higher unemployment' (EC 2012i, p.5). Yet, it continued to defend the pace of fiscal consolidation as a factor key to market confidence (EC, 2012j).

Another route for boosting growth and employment in the entire Euro Area is often advocated, namely a symmetric adjustment process in countries enjoying a trade surplus and fiscal room for manoeuvre. However, the MIP does not convincingly compel them to support domestic demand or accept a greater rate of inflation at home. The Alert Mechanism Report 2013 merely informs that '[in] parallel with the adjustment in Member States with large current account deficits, the external balances of several Member States in surplus have been declining, albeit at a slower pace' (EC 2012i, p. 2).

The next sub-section checks these critical assumptions by examining how Annual Growth Surveys, National Reform Programmes and Country-Specific Recommendations have dealt so far with the social consequences of adjustment; the need to preserve growth-enhancing investment; and the macroeconomic environment at aggregate level.

3.2 Governance in practice: the European Semester since 2011

Comparative analysis of Annual Growth Surveys 2011, 2012, 2013

The Annual Growth Survey 'sets out what the Commission believes should be the overall budgetary, economic and social priorities for the coming year' (EC, 2012k). It involves three main Commission directorates: DG ECFIN, DG Employment and the Secretary General (Interviews, Annex 5). The former two provide input in the form of a Macroeconomic Report and an Employment Report. The latter coordinates and synthesises them. As Hallerberg et al. (2012, p. 42) remark, integrating policy recommendations means 'involving different departments of the European Commission. Without strong leadership […] these different assessments may lead to ineffective or even non-operational compromises'.

Overview of AGSs 2011, 2012 and 2013 (Policy Network, source EC 2010d, 2011e, 2012e)

	AGS 2011	AGS 2012	AGS 2013
General Rationale	'Europe needs to accelerate the consolidation of its public finances, the reform of its finance sector and to frontload structural reforms.' 'The proposed course of action is particularly relevant for the euro area' (p. 3)	'The focus needs to be simultaneously on reform measures having a short term growth effect, and on the right growth model in the medium-term' (p.3). Emphasis on implementation and national ownership.	Similar framing as 2012 'The short term challenge is to restore confidence and stabilise the economy […] while carrying out structural reform which will lay the foundations for a sustainable job-rich recovery' (p. 3)
Priorities	1. Macro-economic pre-requisites for growth 2. Mobilising labour markets, creating job opportunities 3. Frontloading growth-enhancing measures	1. Pursuing differentiated growth-friendly fiscal consolidation 2. Restoring normal lending to the economy 3. Promoting growth and competitiveness for today and tomorrow 4. Tackling unemployment and the social consequences of the crisis 5. Modernising public administration	Same priorities as 2012
New issues or greater emphasis (2012 and 2013)		Differentiated approach to consolidation (p.3) Tackling tax evasion (p. 5) CO2 emission trading and green investments/jobs (p. 5, p. 11) Tackling the 'social consequences' of the crisis (p.10) Promoting white jobs (health/social) (p. 5) Persistent implementation gap in application of EU legislation (p. 12); Administrative efficiency (p. 13) Apprenticeships and traineeships for young people (p. 11)	Real estate and housing taxation should be reformed(p. 6) 'rapid country-wide roll-out of high-speed internet infrastructure (p. 9) e-commerce directive (p. 9) youth guarantees for young people (11) Annex on 'growth-friendly tax policies'

From the table, several observations can be drawn. First, the three Annual Growth Surveys all give priority to fiscal consolidation. There is no other way to restore stability than to cut public spending. This matter is little related to how a supportive environment at EU level could help, such as a more active central bank or a more ambitious growth strategy. AGS 2013, however, mentions briefly two upcoming decisions with a potentially significant impact on Europe's future: the MFF 2014-2020, and measures discussed to deepen EMU. Despite a very intensive debate in the academic and media sphere, the Commission does not question the positive aggregate impact of austerity policies.

Secondly, Annual Growth Surveys 2012 and 2013 mark a significant inflection from a relatively uniform approach to consolidation in 2011. The Commission advocates 'differentiated growth friendly fiscal consolidation', which means protecting investment in education, research, innovation and energy, as well as financial support to active labour market policies. AGS 2012 (EC 2012e, p. 4) puts it bluntly: 'determined fiscal consolidation is a means to an end: it is essential to restoring macro-financial stability as a basis for growth and to securing the future of the European social model.' This approach, nevertheless, bears the risk of overlooking the need for social stabilisers in the short-term.

Thirdly, more attention is paid to the macroeconomic conditions of consolidation. Annual Growth Survey 2012 (EC 2011f, p. 4) urges member states which are not in Excessive Deficit Procedure to let automatic stabilisers play their full counter-cyclical role. AGS 2013 observes that the SGP allows for a certain degree of flexibility for countries faced with 'worse-than-expected economic situation' such as Spain and Portugal (EC 2012e, p. 4). It also stresses the need to enhance the effectiveness of tax systems as a way to tackle fiscal imbalances and to re-orient the economy. The Commission puts forward again proposals made in 2011 for a common corporate tax base, a financial transaction tax and energy taxation.

Fourthly, there are 12 mentions of Europe 2020 in Annual Growth Survey 2011, versus two in 2012 and 2013. AGS 2011 is said to be 'anchored in the Europe 2020 Strategy' (EC 2011a, p. 3). Yet, paradoxically, Europe 2020 seems to get a better treatment in 2012 and 2013. Social and environmental flagship initiatives, if not explicitly referred to, are given as much importance as economic objectives. A sense of emergency is palpable in the social than in the environmental field. With record high levels of unemployment, especially among young people, the Commission admits 'clear signs of increases in the number of people at risk of income poverty' (EC 2011f, p. 10). The support to 'youth guarantees'– a proposal originated from left-wing governments and pressure groups – marks a symbolic shift.

Finally, it is worth noticing that the Euro Plus Pact is mentioned six times in 2012, but not at all in 2013. Like for Europe 2020 in 2011, this can be explained by the political momentum of the agreement. The Pact's priorities, nevertheless, casts a long shadow on the recommendations enshrined in the Annual Growth Surveys, especially pension systems reforms, labour-market reforms, tax wedge on labour and wage setting systems. Many of these measures also reflect the MIP's indicators.

Overall, the Commission's Annual Growth Surveys reveal a growing concern about the social impact of adjustment in the euro area and the need to preserve long-term investment. Yet, these elements do not seem to translate into genuinely different recommendations. The state of play might reflect the balance of administrative and political power in Brussels. According to Commission officials, 'competition' between DG Employment and Social Affairs and DG Economic and Financial Affairs has increased since the setting-up of the European Semester. Europe 2020's social objectives present an opportunity for the former to counter-balance the latter's predominance. However, the quality of scientific evidence is key to influencing the framing of the Growth Surveys and Country-specific Recommendations. DG

Employment's interest for a proposal such as a Eurozone stabilisation fund safeguarding fiscal room for social investment strategies can be read in this light (Interviews, Annex 5).

This tension between economic and social bodies in the Commission is strikingly similar at the Council's level. In 2012, seven Council formations held debates on the Annual Growth Survey between December 2011 and February 2012.[4] The conclusions of the Employment and Social Affairs Council's meetings (EPSCO) are said to receive more attention today than they did during the last decade (Interviews, Annex 5). ESPCO called for instance in February 2012 to strike a balance between fiscal consolidation and social cohesion. In October, it expressed concerns about the marginalisation of the social dimension in the European Semester and about issues such as pension systems, wages policy and tax wedge on labour addressed by the Economic and Financial Affairs Council. The Education Council warned in November 2012 against 'cuts across the board' which would potentially harm member states' educational systems. These elements reveal a growing concern against a Semester dominated by stability considerations.

Implementation: National Reform Programmes and Country-specific Recommendations in Finland, France and Italy

How do member states take ownership of the European Semester's processes? What does the EU have to say to a 'well-doing' country such as Finland, and how are the social impact of the crisis and long-term objectives dealt with in France and Italy?

FINLAND

Finland ranks among the 'good pupils' of the Euro Area (see 'Macroeconomic situation of Finland, France, Italy, 2007-2012', Annex 4), although the Commission undertook in 2012 an 'in-depth review' on account of the country's deteriorating export market share and high level of private indebtedness. The review found that Finland was 'experiencing imbalances, which [were] not excessive but [needed] to be addressed'. Finland remains under surveillance with 14 other member states in 2013.

- National Reform Programmes 2011 and 2012

What is striking is the centrality of Europe 2020 in Finland's National Reform Programmes 2011 and 2012. The Strategy is mentioned 18 times in 2011. In a foreword, Prime Minister Katainen stresses that 'economic growth must be ecologically and socially sustainable' and he places 'the wellbeing of citizens, a high employment rate, education, comprehensive income security and effective social and health services' at the core of his objectives (Finland 2011, p. 13). A whole section is dedicated to 'National targets and measures to achieve them'.

[4] See Council's website, 'The European Semester in 2012', http://www.consilium.europa.eu/special-reports/european-semester/the-european-semester-in-2012 [accessed 15/02/2013]

EU recommendations to Finland in 2010 are listed at the end of the document and show that the National Reform Programme's scope is however broader than Europe 2020's objectives. In particular, the document answers the EU's demand for greater productivity in the public sector, more action against long-term unemployment, and greater competition in services. Measures in favour of competitiveness consist mainly in shifting the tax basis from labour and corporate bases to capital income, inheritance and fuels. Despite a very strong fiscal position (48.7% debt/GDP, 1.1% deficit in 2011), the government plans further consolidation, mainly through spending cuts until 2015. Defence, central administration and local governments are the most affected budgets; education and research also take a hit, but Finland already ranks among the best EU performers in this field.

In 2012, the Euro Plus Pact and the MIP are dedicated a significant share of the document. Finland partly contests the Commission's decision to carry out an in-depth review by arguing that its export base is 'very cyclically sensitive'. In addition, the Government notes that the social partners also bear some responsibility in wage developments (Finland 2012, p. 22). Accent is put on boosting growth, competition and jobs in the short term: on top of fiscal consolidation, the main priorities are 'diversifying the production structure', 'full utilisation of labour' and 'increasing competition'.

- Country-specific Recommendations 2011 and 2012

The five EU recommendations were very similar in 2011 and 2012: Finland should focus on ensuring fiscal sustainability, increasing the public sector's efficiency, enhancing support to long-term unemployed and boosting competition on product and services markets. Improving external competitiveness was the real new item in 2012, and the recommendation is explicitly referred to the MIP. In both cases, there was no significant variation from the Commission's draft recommendations and the Council's final version. In 2011, a reference to social dialogue practices was added. In 2012, a formulation calling for greater competition in the provision of municipal services was slightly attenuated.

- The view of practitioners

Finnish officials are rather ambivalent towards the European Semester (Interviews, Annex 5). Finland was reluctant to endorse the Europe 2020 Strategy in 2010, and the dominant feeling is still today that the EU pursues too many objectives while responsibilities are not sufficiently delimited. On one hand, the Commission's recommendations go too far in identifying policy reforms and 'lecturing' member states. On the other hand, a greater involvement of the Council and of national parliaments is called for. Peer pressure between member states should be given more room.

FRANCE

France was severely affected by the crisis and is struggling to bring its deficit below the 3% threshold at the end of 2013. In parallel, serious concerns about the country's competitiveness have been raised although this has, as yet, only translated to a single-level downgrade of France's financial creditworthiness. Under the MIP, the Commission estimated

that the country needed in-depth reviews both in 2012 and 2013. In June 2012, France was 'experiencing *serious* imbalances, which [were] not excessive but [needed] to be addressed'.

- National Reform Programmes 2011 and 2012

France's National Reform Programmes build upon the 'Integrated guidelines' adopted by the European Council in 2010. They distinguish between macroeconomic reforms (Guideline 1 on the 'sustainability of public finances'), sector specific policies (Guidelines 2 to 6 covered by Article 121) and employment and social objectives (Guidelines 7 to 10, Article 148).

In 2011, the NRP called for a strategy combining 'an unprecedented drive to put its public finances on a viable footing' with 'structural reforms geared to the determinants of potential growth' (French Government 2011, p. 3). 12 commitments were earmarked 'Euro Plus Pact'. Particular stress was put on the pension reform raising the retirement age passed in November 2010. However, the economic forecasts on which the macroeconomic scenario was based proved largely wrong: the Government foresaw a GDP growth of at least 2% in 2011, 2012 and 2013, far from the actual and expected below 1% figures.

In terms of innovation and competitiveness, the document lists a long series of micro-initiatives (tax credits for research purposes, improving studying conditions, funding for SMEs…), but none of them really stand out. Almost two pages (French Government 2011, p. 38-39) explain how France is progressively opening up its transport, energy and postal markets. The comprehensive section on employment and inclusion policies reflects France's traditional insistence on social cohesion. It refers explicitly to Europe 2020 targets. Most of the measures listed are state-funded (like the *revenu de solidarité active*, a complement to low earned incomes) and it is hard to see any structural move on the labour market front.

The 2012 document does not represent any major departure from 2011, but it clearly answers the concerns raised by the Recommendations 2011 and by the Commission through the MIP. A section is dedicated to the MIP and France's bleak exports performance. The main response is to shift part of the social security funding from taxes and contributions on labour to VAT. The document also answers the Recommendations' insistence on tackling labour market segmentation and optimising the performance of the placement public service '*Pole Emploi*'. The fiscal section insists on the need for more burden-sharing between the central government, local governments and the health system without giving any further details.

- Country-specific Recommendations 2011 and 2012

They are largely framed along the same lines, although the 2012 version refers explicitly to the MIP for 3 out of 5 items, thereby indicating a greater degree of pressure: 'combat[ting] labour market segmentation', 'shifting the tax burden from labour to other sources of taxation that weigh less on growth; 'remove unjustified restrictions on regulated trades and professions'. No significant change was discernible between the Commission's drafts and the versions endorsed by the European Council.

- The view of practitioners

The French administration uses the ES as an opportunity for domestic coordination and social dialogue. French officials try to engage the Commission as early as possible in a dialogue with all relevant stakeholders. Implicit in this method is the attempt to influence the process and to make the Commission's recommendations more adapted to national realities.

ITALY

Italy's anaemic growth and high levels of debt has been under financial markets' scrutiny for almost three years and has translated into higher yields on government bonds. Many experts also point to the responsibility of poor collective management of the Euro Area debt crisis (De Grauwe, 2012). Italy was placed under MIP-surveillance by the Commission in 2012 and 2013. In June 2012, it was said to experience 'serious imbalances, which [were] not excessive but [needed] to be addressed'. High indebtedness, low growth and poor export performances were the most pressing issues.

- National Reform Programmes 2011 and 2012

Although they don't radically differ from each other, the change of political context makes the two documents interesting to compare. In 2011, Italy seems to be on the defensive; the National Reform Programme often sounds like a box-ticking exercise. There are extensive references to the Annual Growth Survey and the Euro Plus Pact. Accent is put on restoring public and private financial stability and to improve the country's competitiveness and labour productivity. Only reforms 'with low or no impact on public accounts' (Italy 2011, p.1) are considered, such as aligning the retirement age on life expectancy, decentralising wage-bargaining and cutting back paperwork for SMEs. Europe 2020 objectives are not ignored, with indications of education reform, research incentives, a renewable energy action plan, a 'Social card' against extreme poverty.

The 2012 Reform Programme is introduced by Mario Monti in a 7-page foreword (Italy 2012, p. III-IX). The new Prime Minister takes very clearly the defence of a long-term approach to reforms anchored in the Europe 2020 vision: 'The Europe 2020 Strategy constitutes an integral part of the national agenda […] it is not enough to focus on the short-term to get over the critical phase'. Europe 2020 should not be seen as a technocratic exercise, but rather as a consistent approach to reform that promotes 'the construction of a highly competitive social market economy'. Growth-friendly and fair fiscal consolidation materialises through tax increases on consumption and property, tax cuts on business and labour, a higher quality of public spending, and a resolute fight against tax evasion. To stimulate growth and employment, the government relies on greater competition, labour-market reform, an infrastructure investment plan and a Cohesion Action Plan for Southern Italy (based on EU structural funds). M. Monti argues that the social impact of these reforms is likely to be shorter and softer if implemented quickly, at the same time and in a consistent way.

- Country-specific Recommendations 2011 and 2012

Again, some difference is perceptible between 2011 and 2012. In 2011, the EU urges Italy to act on many fronts: fiscal consolidation, tackling labour market segmentation, altering the wage-setting system, increasing competition in services, improving the business environment and the quality of spending. In 2012, Italy is rather encouraged to implement or adopt planned reforms and to make the most of EU funds. Youth unemployment and education standards are subject to a new recommendation.

Synthesis and outcomes

What does this overview of the European Semester's implementation in three countries reveal? Does this coordination exercise at EU level make any difference?

First, the dialogue between the Commission and member states has reached a very advanced level today. Member states are under permanent scrutiny. The capacity of the Commission to draft Country-specific Recommendations that are adopted almost word by word by the European Council is striking. However, this pressure is almost exclusively geared towards restoring fiscal and macroeconomic stability. It reflects by and large the expectations of financial markets. Recommendations do not provide any convincing indication on how implementing this agenda can help to achieve Europe 2020 objectives.

Secondly, member states take advantage, to various degrees, of the Semester to deliver a consistent vision encompassing short-term measures with long-term objectives. The personal endorsement of the Finnish and Italian National Reform Programmes at prime ministerial level signals a more fine-tuned and prioritised approach to the various economic, social and environmental objectives. France's National Reform Programmes and the 2011 Italian document, in contrast, lack the underpinning of a genuinely strategic vision.

Thirdly, a country like Finland does not really need to be placed under surveillance in the same way as are France or Italy. With fiscal, macroeconomic and structural well ahead of EU averages, improvements can only be made on the margin. There is no risk of Finland's imbalances spilling over onto the Euro Area. As Hallerberg et al. (2012) note, the whole process of the ES makes much more sense for countries presenting substantial risks for the monetary union, both in their capacity to adjust in the short term as regards their growth potential. As the reaction of Finnish officials shows, the legitimacy of the Commission's relatively homogenous approach is in question.

Fourthly, there was evidence of structural reforms in France and Italy in the last few years. However, it is very hard to attribute them to the merits of the European Semester. Coming back to Wyplosz (2010, see above p. 6), markets remain the most powerful drivers of reforms. After François Hollande was elected in spring 2012, the new Parliament cancelled a law passed a few months earlier, which planned a transfer from taxes on labour to VAT. This measure was subject to a recommendation from the EU in July. Yet, it was under pressure from the business sector that the Government reversed course and proposed a 'Growth and Competitiveness Pact' containing similar provisions in November 2012.

Conclusion

This paper aimed at providing an assessment of the EU's ability to steer European economies towards a sustainable growth model combining competitiveness, social inclusiveness and environmental responsibility. It was based on the understanding of the EU as a multi-level governance system implying different modes of decision-making, and leaving sizeable space for negotiation, competition and deliberation between numerous actors. It asked whether the Europe 2020 Strategy and its integration into the European Semester offered better prospects of success than the Lisbon Strategy during the last decade.

As such, Europe 2020 lays out a reasonably well articulated vision and provides a much-needed baseline to EU policy-makers. However, its patchy institutional processes and instruments should not delude anyone. The Strategy is a compromise which reflects the degree of integration, coordination and resource-pooling that member states and public opinions buy into on average. The legal imbalances cutting across flagship initiatives and playing against more ambitious 'market-correcting' measures are likely here to stay. Europe 2020 provides no magic bullet, but represents an opportunity to hold leaders and policymakers accountable for the long-term.

A common assumption is to dismiss the European Semester and the new regime of surveillance attached to the Monetary Union as a straightjacket imposed on national member states. An analysis of the first three Semesters shows that the Commission has indeed tended to push for market-based adjustment policies uniformly. The literal enforcement of rules has come to the detriment of more fine-tuned approaches to collective management and to the long-term growth potential of member states. To be fair, with national governments and parliaments reluctant to show more solidarity with each other, the reliance on market processes may have been the only option available to bring stabilisation back.

Two years of practice show nevertheless that EU economic governance is a space for administrative and political negotiation. Next to a Commission constrained by limited resources, a strict mandate and little political clout, member states have the opportunity to frame the debate differently and to make the most of the EU toolbox. Governments and parliaments can craft consistent strategies that link the current imbalances to the pursuit of more resilient growth models adapted to national realities. This process, however, would gain a lot from further governance innovations at the EU and national levels, many of which are accessible without changing EU treaties.

Ways to deal better with the contradictions between short-term and long-term objectives should be explored. Europe 2020 should not be a 'good-weather strategy' only. The schedule of fiscal consolidation should be revised in countries faced with zero-growth prospects and effectively seeking a higher quality of spending and administration. This could be the bulk of 'reform contracts' between the EU and member states, which should be set up on a voluntary basis, pursue a long term vision and open to additional EU funding. In the future, a European stabilisation fund could help member states experiencing downturns not to have to sacrifice too much to the logic of market-based adjustment. Greater consistency between the Macroeconomic Imbalance Procedure and Europe 2020 social targets should

be ensured, for instance through a ‘social corridor’ facilitating the consistent development of wages and social protection, and avoiding zero-sum policies. Broadening the EU’s competences to the industrial field would also make more collective and proactive strategies possible against the risks of global competition.

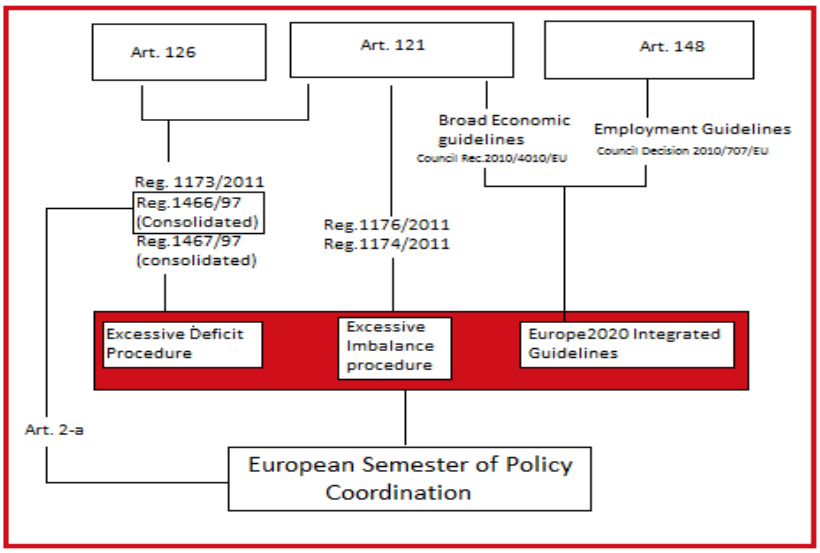
In parallel, the political steering of EU economic governance should be strengthened. National parliaments and social partners should be involved as early as possible in the discussion of Annual Growth Surveys and National Reform Programmes. In the long run, Annual Growth Surveys and Country Specific Recommendations should be adopted according to the ordinary legislative procedure, thus transforming the European Semester into a high-level political debate going beyond technocratic governance.

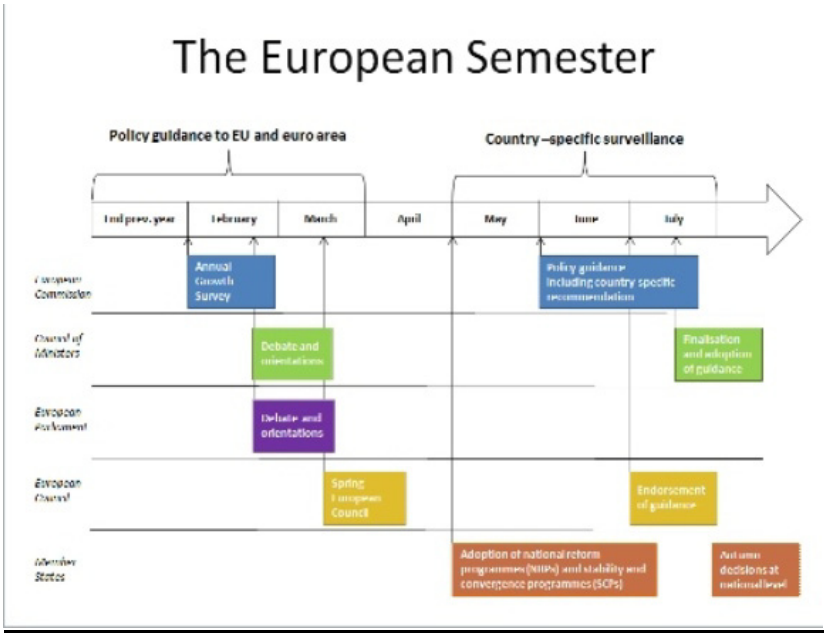
ANNEX 1: Europe 2020 policies and track record 2011-2012(source: EC)

Objective	Target	Flagship initiative	Competence / decision-making	Main actions at EU level	Main actions at national level	Progress so far
Smart	**3% spent on R&D**	**Innovation Union**	Single market: shared (Art. 4), research: shared (but non-binding) Economic Guideline 4- Art. 121	Complete ERA Improve conditions for business innovation Launch European Innovation partnerships Greater EU funding for innovation Promote knowledge partnerships and entrepreneurship	Reform R&D and innovation systems Train more researchers Prioritise knowledge expenditure and promote private R&D investments Ensure a sufficient supply of science, math, engineering graduates	2 legislative proposals adopted: EU patent, standardisation, 4 legislative proposals pending : Horizon 2020 (merging R&D and innovation funding), Cohesion 2020, public procurement, venture capital 5 EIPs launched on active ageing, agriculture, smart cities, water, materials European Public Sector Innovation Scoreboard
		Digital Agenda for Europe	Single market: shared (Art. 4) Economic Guideline 4- Art. 121	Digital Single Market Greater EU funding for investment in ICT	Draw up high speed strategies Limit the cost of network roll-out (public intervention only if market failures) Develop online public services	Adoption (2012) of the Radio Spectrum Policy programme (deployment of 4G) Communication on e-commerce (2012) = update of the E-commerce directive Draft regulation on electronic authentication (2012) Cloud computing strategy (2012) Upcoming Internet security strategy (2013)
	40% in tertiary education and less than 10% school dropping out	**Youth on the move**	education, vocational training, youth and sport: optional (Art. 6) Employment Guideline 9- Art 148	Enhance EU's mobility programmes and link them up with national programmes and resources Modernization agenda for higher education and benchmark universities Boost mobility of young professionals (EURES)	Ensure "efficient investment in education and training systems at all levels" Tackle early school leaving Improve the relevance of education systems in relation to job market needs Improve young people's entry into the job market	Experimentation of EURES Council recommendation on policies against early leaving from education and training (2011) Communication on the modernisation of higher education (2011)
Sustainable		**Industrial policy**	Single market: shared (Art. 4), industry: optional (Art. 6) Economic Guideline 6- Art. 121	Competitiveness proofing of EU regulation Support the restructuring of sectors in difficulty and the greening of services and manufacturing Improve business environment for SMEs	Support business environment for SMEs (public procurement, smart regulation, intellectual property…)	Impact assessment on competitiveness and SMEs of all legislative proposals Reviewed Small Business Act (2011) Action plan 'Access to finance for SMEs' Draft regulations on European VC and social entrepreneurship funds (2011) Sector-specific strategies: space (2011), CARS 21 (2012)

	20/20/20	**Resource efficient Europe**	Environment, energy: shared (Art. 4) Economic Guideline 5- Art. 121	Make EU and national funding more consistent Improve market-based instruments: ETS, taxation, state aid, public procurement Upgrade energy networks Energy efficiency action plan Single Energy Market	Phase out environmentally harmful subsidies Make the most of fiscal incentives and public procurement Coordinate implementation of infrastructure projects	Directive on Energy efficiency (2012/27/EU) CAP reform proposal (awaiting MFF settlement) Regulation proposal on Trans-European energy infrastructure 2020 (awaiting MFF) Decision proposal on an Environment Action Programme (Nov. 2012): includes requirements for MS to remove environmentally-harmful subsidies Proposal for a revised Energy taxation directive
Inclusive	**75% employment**	**Agenda for new skills and jobs**	Social policy: coordination (Art 5) Employment Guidelines 7 and 8 - Art 148	Coordination of the flexicurity agenda ESCO (common classification of jobs and skills) Integration of third country nationals/migrants Review directives on working time and posting of workers, and health and safety legislation Promote intra-EU mobility and migration policy in line with labour markets need Erasmus for young entrepreneurs	Pursue transition towards flexicurity labour markets Make work pay, review tax and benefit systems Implement the European qualifications framework Increase consistency between education, training and work Improve work-life balance and gender equality	Implement further the Communication on flexicurity (2008) and the New skills for new jobs initiative (2008) Proposal for a revamped posting of workers directive (2012) and EGAF
	-10% poverty	**European Platform against poverty and social exclusion**	Social policy (Art 5): coordination Employment Guidelines 9 - Art 148	Cooperation, peer-review, best practice EU programmes to promote social innovation and take poverty concerns into account in all EU policies Assess adequacy and sustainability of social protection and pension systems	Dedicate specific programme to vulnerable groups (elderly, Roma, minorities, one-parent families…); Ensure adequate income support and access to health care via social security and pension systems	

ANNEX 2: the European Semester, legal architecture (Hallerberg et al, 2012) **and timeline** (EC)





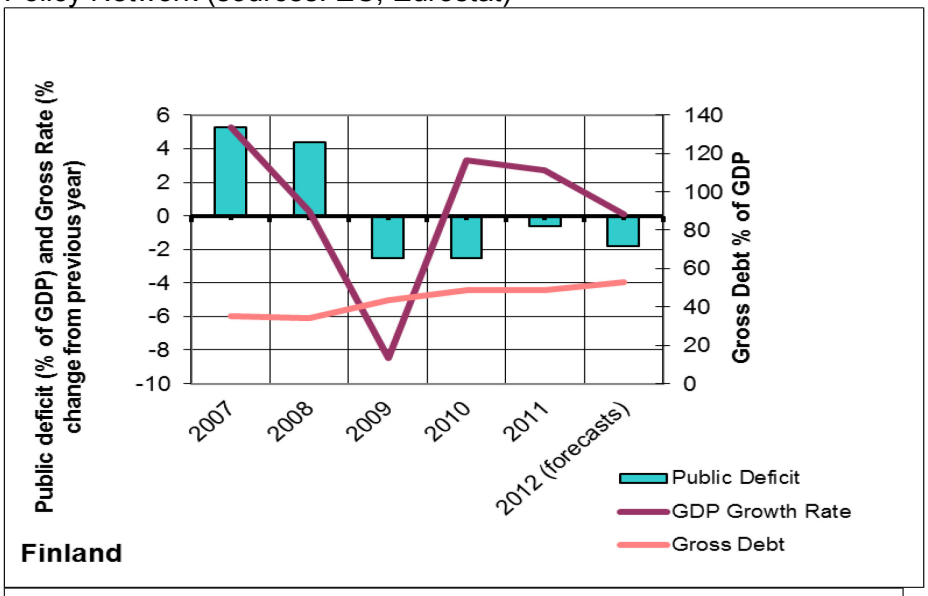
ANNEX 3: Main reforms of economic governance, 2011-2012 (Policy Network, source: EC)

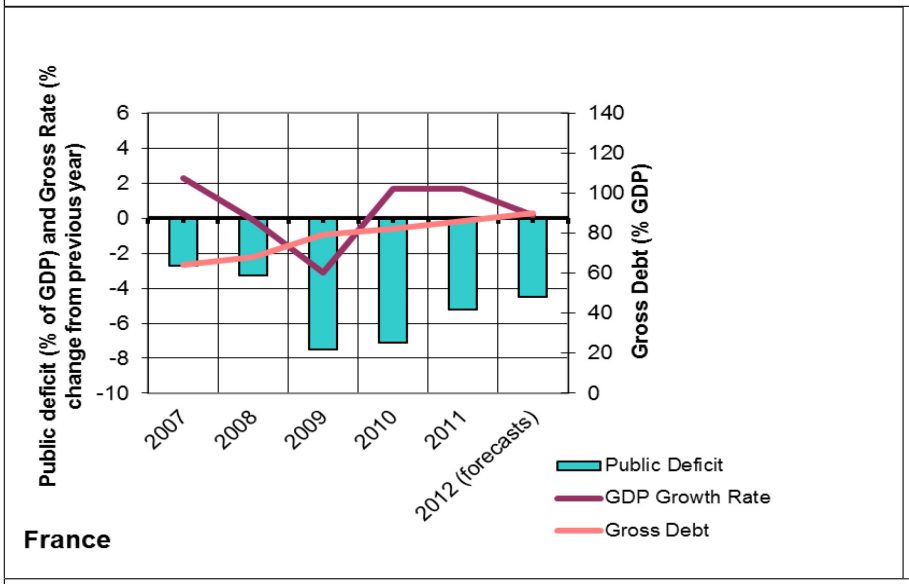
Legal basis	Perimeter	Policy targets or indicators	Decision-making process
Stability and Growth Pact (SGP) Art. 126 6-Pack, 2-Pack*	Preventive arm: EU 27 Corrective arm (sanctions): Euro area	Medium term objective of budget balance and deviations from it Debt dynamics	Stability or Convergence Programmes EC monitoring and peer pressure in the Council and European Council Semi-automatic sanctions (reverse QMV) applying only to euro area countries
Macroeconomic Imbalance Procedure (MIP) Art. 121 6-Pack	Preventive arm: EU 27 Corrective arm (EDP, EIP): Euro area	Current account balance Net international investment position Export market shares Nominal unit labour cost Real effective exchange rate Private sector debt Private sector credit flow Housing prices Public debt Employment rate Financial sector leverage**	National Reform Programmes EC monitoring and peer pressure in the Council and European Council Semi-automatic sanctions (reverse QMV) applying only to euro area countries
Euro Plus Pact	EU 27 - UK, SW, CZ, HG	Competitiveness Employment Public finances Financial stability Tax coordination	MS commitments to be included in National Reform Programmes EC monitoring and peer pressure in Euro Summits
Treaty on Stability, Coordination and Governance (TSCG)	EU 27 - UK, CZ	Lower limit of structural deficit (0.5% over term) Debt brake in national constitution or equivalent Macroeconomic coordination	Debt brake in national law EC monitoring and Euro Summits E. Council decision over ECJ involvement

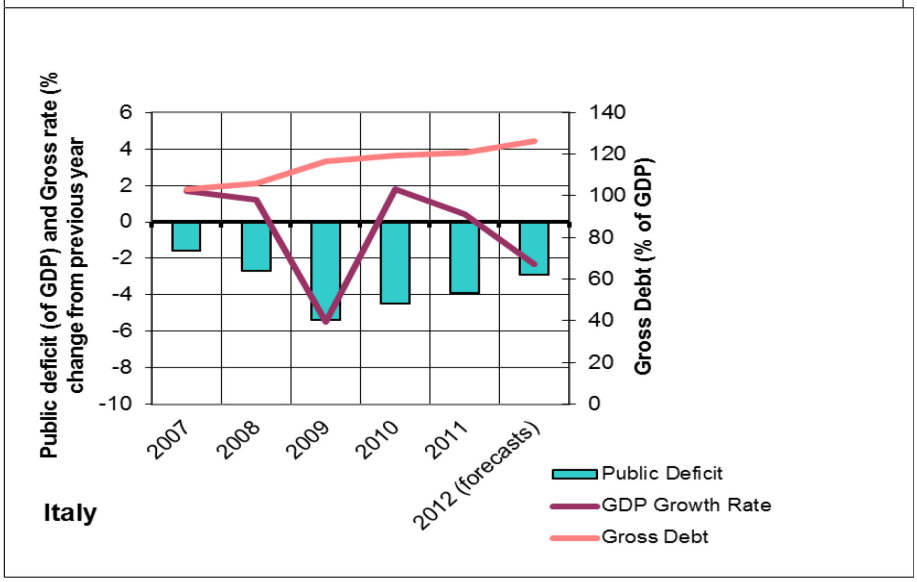
*still under negotiation

** new criteria incorporated in 2012

ANNEX 4: Macroeconomic situation of Finland, France, Italy, 2007-2012, Policy Network (sources: EC, Eurostat)







Annex 5: Interviews with the author (realised on 10 January 2013 in Brussels)

- **Egbert Holthuis**, Head of Unit "Social Protection, Social Inclusion Strategy", Directorate-General for Employment, Social Affairs & Inclusion, European Commission
- **Lukasz Kolinski**, member of Herman Van Rompuy's cabinet, European Council
- **Jakub Koniecki**, member of Commissioner Hedegaard's cabinet, Commissioner for Climate Action, European Commission
- **Anne Pohardy** counsellor for ECOFIN coordination and financial assistance, and **Annie Guyader**, counsellor for social affairs, Permanent Representation of France to the European Union
- **Karl Pichelmann**, Directorate General for Economic and Financial affairs, European Commission
- **Jani Pitkaniemi**, Counsellor for Economic and Financial Affairs, Permanent Representation of Finland to the European Union
- **Shahin Vallée**, member of Herman Van Rompuy's cabinet, European Council

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Integration of Central and Eastern European Countries: Increasing EU Heterogeneity?

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Contents

Tables and Figures

Abstract

The paper assesses the heterogeneity of an enlarged European Union and discusses the role and contribution of CEECs on the development of this heterogeneity over time. The two central research questions are: What are the factors that distinguish between successful and less successful CEE countries in terms of the EU enlargement? How was heterogeneity in the EU developed in the last decade? Using cluster analysis methods allow the focusing on heterogeneity in the five selected dimensions of interest: Institutions and Governance; Single Market and Openness; Macroeconomic Policies; Symmetry and Convergence; and Competitiveness. We can find that the specific macroeconomic policies followed by CEE countries during the transformation period were less decisive for a successful transition than the level of (non-elite) political stability, the quality of institutional framework, the maturity and compatibility of informal institutions and the initial level of economic development. We also can find substantial convergence in terms of economic indicators in the EU in the period considered but none or a very slow convergence in terms of institutional indicators. The negative consequences of such heterogeneity were strengthened by the crisis. As a consequence the tensions caused by these different speeds of convergence in different fields challenge the long-term sustainability of EMU, and the consequences of this situation should be more intensively discussed in the EU. We also argue that the experience of transition of CEE countries holds valuable lessons for the currently discussed reforms of the southern periphery of Europe. Similarly to the CEECs before their entrance to the EU, the periphery countries need to find a direction to head for in the next 10-15 years. Budgetary savings are inevitable; nevertheless positive long-term visions should be formulated as well.

Key words: CEE countries, Cluster analysis, European governance, EMU, EU integration, EU economic policy, EU heterogeneity

JEL: E63, F15, F42

Executive summary

European Union enlargement by Central and Eastern European countries (CEECs) brought about a discussion on common policy coordination. The paper assesses the heterogeneity of an enlarged European Union and discusses the role and contribution of CEECs on the development of this heterogeneity over time. The two central research questions are examined in the paper: 1. What are the factors that distinguish between successful and less successful CEE countries in terms of the EU enlargement? 2. How was heterogeneity in the EU developed in the last decade? As regards the former, we focus particularly on the identification and discussion of factors determining the integration strategies of CEE countries during the transition period in the 1990s. As far as the later is concerned, using cluster analysis methods allow the focusing on heterogeneity in the five selected dimensions of interest: Institutions and Governance; Single Market and Openness; Macroeconomic Policies; Symmetry and Convergence; and Competitiveness. The attention is also paid to the evolution of cluster memberships over time by using four milestones: 2000 (the starting point of analysis), 2004 (the EU enlargement), 2008 (the start of the financial crisis) and 2011 (the most recent period with the available data). In addition to that, contribution of the CEECs to development of the EU heterogeneity over time is examined. Within the analysis, we employ especially the data by Eurostat, World Bank and Heritage.

Focusing on the first central research question, we can find that ex-ante strategies of economic reforms and specific macroeconomic policies followed by CEE countries during the transition period were less decisive for a successful transition than the level of (non-elite) political stability, the quality of institutional framework, the maturity and compatibility of informal institutions and the initial level of economic development. Furthermore, we emphasize the importance of a clear prospect – accession to the EU – for the success of the transition process. Focusing on the second research question, we can find that the EU countries do not make homogeneous clusters. Neither do the CEE countries make a homogenous cluster in most of the dimensions over the whole period analysed. The most homogeneous “Eastern” cluster still exists in the area of institutions, where in 2008 only Estonia joined the Western countries. The polarization North-West vs. South-East is identifiable particularly in the dimensions of Governance and Institutions and Competitiveness, in other dimensions such as Single Market and Openness or Symmetry and Convergence, the CEE countries have already converged considerably. The heterogeneity increases when enlarging the core of the EU/EMU by the CEECs in almost all dimensions. However, their contribution to EU heterogeneity is comparable to the impact of the periphery countries in most of the dimensions.

According to our results, we can emphasize two major policy relevant conclusions. Firstly, we argue that the experience of transition of CEE countries holds valuable lessons for the currently discussed reforms of the southern periphery of Europe. Similarly to the CEECs before their entrance to the EU, the periphery countries need to find a direction to head for in the next 10-15 years. Budgetary savings are inevitable, nevertheless, positive long-term visions should be formulated as well. On the other hand, it is not so important whether the way to competitiveness should be based on, e.g., knowledge economy, cheap exports or tourism since, in our opinion, there could be more alternative ways to prosperity. Rather than particular forms of economic policies, the existence of a vision itself and its support across the political spectrum are more important for successful transformation of peripheral countries.

Secondly, we also point out the contrast among development in particular dimensions. We can find substantial convergence in terms of economic indicators in the EU in the period considered but none or a very slow convergence in terms of institutional indicators. The negative consequences of such heterogeneity were strengthened by the crisis. As a result, the tensions caused by these different speeds of convergence in different fields challenge the long-term sustainability of EMU, and the consequences of this situation should be more intensively discussed in the EU. On the other hand, we consider a certain level of heterogeneity in some dimensions such as in the fiscal area as natural because of different welfare state models and considerably varying living standard across European countries. To be more specific, instead of harmonization being discussed, we call for better coordination and joint responsibility in terms of policies and institutions in the European Union.

1. Introduction

Europe is integrating. Apart from the indisputable benefits of European Union enlargement based on fundamental ideas of European unity, there are also difficulties associated with integration that should be solved. European Union enlargement by Central and Eastern European countries (CEECs) in 2004 and 2007 as well as enlargement by Croatia in 2013 brought about higher demands for common policy coordination. It also increased the complexity of decision-making mechanisms and of reaching a common consensus[1]. Regarding EU enlargement in 2004, Zielonka (2007) notices that the hierarchical governance structure has become insufficient and suggests delegating authority to specialized institutions[2]. In addition, Delhey (2007) points out that EU enlargement brought about a decline in social cohesion between the old and new EU countries within the EU[3].

When joining the EU the CEECs explicitly accepted a commitment to seek the adoption of the Euro in the forthcoming future. However, the monetary unification process seems to continue slowly towards the East of Europe. The heterogeneous approach towards the monetary unification process among the new members of the EU in 2004 and later leads to an existing insider-outsider constellation in the EU. Focusing on the CEECs one can distinguish between countries in favour of a common currency, such as Slovenia, Slovakia or the Baltics and also countries with a purely pessimistic approach like the Czech Republic. Poland's statements regarding the Euro might be considered as careful regarding the current state of the fulfilment of Maastricht criteria. The recent economic problems of Hungary have postponed serious thoughts about Euro adoption to a time after 2020.

As regards fiscal policy and public finance, the CEECs' strategies and outcomes are rather heterogeneous as well. While Slovenia, Hungary and Poland are approaching the average Western European level of redistribution; the other CEE countries are redistributing an obviously lower share of their GDP[4]. Similarly, as far as public debt is concerned, most of the CEE countries are considered to be trustworthy debtors, moreover, Estonia together with Luxemburg are permanently the least indebted countries in Europe. On the other hand, Hungary, Latvia and Romania had to ask for foreign financial aid during the first wave of the economic crisis.

Regarding a large enlargement of the EU and the CEECs' rather disharmonised stances and approaches, one might ask the question about the current level of heterogeneity in the EU and the contribution of the CEECs to its development.

In this paper we assess the heterogeneity of an enlarging European Union and discuss the role and contribution of CEECs to the development of heterogeneity over time.

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[1] These are well illustrated by the establishment of the Treaty on Stability, Coordination and Governance Union (known as TSCG or the Fiscal Stability Treaty). The treaty could not be incorporated into the primary legislation of the EU due to the refusal of Great Britain. Accordingly, the treaty was signed by 25 EU countries as an intergovernmental treaty with the exception of Great Britain and the Czech Republic.

[2] Establishing the European System of Financial Supervision might be considered as an example of such an institution.

[3] Delhey computed an *index of trust* based on the Commission's Eurobarometer Survey and the Central and Eastern Eurobarometer.

[4] Measured as Government spending/GDP

Two central research questions are examined in the paper.

1) What are the factors that distinguish between successful and less successful CEE countries in terms of the EU enlargement?
2) How was heterogeneity in the EU developed in the last decade?

Considering the first central question, we focus on the identification and discussion of factors determining the integration strategies of CEE countries during the transition period in the 1990s. We particularly focus on the changing political and institutional environment and macroeconomic policies of the CEECs in relation to the processes of integration. Regarding the second central question, we use the cluster analysis methods to examine the degree of homogeneity in the enlarging European Union. We apply a multi-dimensional approach focusing on heterogeneity in five selected areas of interest: 1) Institutions and Governance; 2) Single Market and Openness; 3) Macroeconomic Policies; 4) Symmetry and Convergence; and 5) Competitiveness. In particular, the cluster analysis is applied to examine four constituent questions: (*i) To what extent do EU countries make homogenous clusters and which countries tend to make common clusters or act as usual outliers (i.e. to explore the degree of homogeneity)? (ii) Do CEECs act as an internally homogeneous cluster within the EU? (iii) How does the clustering structure evolve over time? (iv) What is the contribution of CEECs to the changing degree of homogeneity (i.e. do CEE countries increase EU heterogeneity)?*

Given the examination of heterogeneity as the main goal of the paper, one might ask whether the high level of homogeneity and the reducing heterogeneity are a desirable goal of European integration. Arguments justifying rising homogeneity can be found in economic literature and EU legislation.

As regards general statements related to EU homogeneity, Cappelen et al. (2003) state that *Greater equality across Europe in productivity and income has been one of the central goals of the European Community since the early days of European economic integration.* Alesina et al. (2005) add that countries of the Union should be homogenous to reach the economies of scale or externality internalisation as a positive outcome of integration. Also the recently adopted legislations on the Macroeconomic Imbalance Procedure (MIP), the Fiscal Compact presented in the Treaty on Stability, Coordination and Governance (TSCG) or the Euro Plus Pact[5] are based on the assumption of higher structural similarity within the EU, since the introduction of these procedures and treaties aims to support the convergence of individual economies to reduce national deviations. According to Trichet (2013) this leads to a remarkable progress in coordination of EU governance.

Also the major part of the EU budget consolidated in the structural funds is aimed at decreasing regional disparities. The Europe 2020 Strategy aims at achieving smart, sustainable and inclusive growth. In the frame of the definition of inclusive growth, the Strategy stresses the need for reducing regional disparities stating that "*Regional development and investment also support inclusive growth by helping disparities among regions diminish and making sure that the benefits of growth reach all corners of the EU"* (European Commission, 2012a).

[5] The pact includes the treaty of 24 EU countries (excluding the Czech Republic, Hungary, Sweden and the UK) on the introduction of structural reforms improving competitiveness and fiscal discipline. The reforms are also aimed at supporting the convergence processes in individual EU economies.

The paper is structured as follows: The introductory section explains the motivation and goal of our research. The methodology and data are explained in the second section. The third section focuses on a descriptive analysis and discussion on the integration strategies of the CEECs towards the EU and EMU. In the fourth section the results of the cluster analyses examining the degree of homogeneity in the EU are presented. Results of the sensitivity analysis are described and summarized in the fifth section. The sixth section is the conclusion.

2. Methodology and data

Cluster analysis is an appropriate and much used method to identify groups of internally homogenous countries with similar characteristics in respective areas. Focusing on the EU from an economic or political sciences perspective there are a number of studies following cluster analysis in recent literature[6]. Since we are interested in the level of EU integration that can be seen as a degree of homogeneity among the studied EU countries, attention is paid not only to the clustering itself but also to the evolution of cluster memberships over time. For this purpose we apply the agglomerative Ward method with a squared Euclidean distance in order to emphasize inner homogeneity and to stress outliers reflecting the scope of this contribution. We firstly explore the resulting clusters in the EU from a static point of view. Consequently, we examine the dynamics of clustering. Analysing the evolution of the average distances and their variances measured in the dendrograms to get evidence of the continuing integration process. In addition to that, the contribution of CEECs to the level of heterogeneity in the EU over time can be observed both from dynamic graphs and radar graphs that depict consecutive historical milestones in modern EU history.

The milestones include the year 2000 as a starting point to explore the integration. 2004 was chosen as the year of EU enlargement, mainly with the Central and Eastern European countries. Next, we consider 2008 as the end of the boom period and the start of the financial crisis; and finally 2011 as the most recent period in which the impact of the crisis could already be analysed. The group of CEECs involves the Czech Republic, Hungary, Poland, Slovenia Slovakia and the Baltic countries Estonia, Latvia and Lithuania. These countries enlarged the European Union in 2004. We also include Bulgaria and Romania in the analysis as a part of CEE countries, joining the EU in 2007. The contribution of CEECs to EU heterogeneity is compared to the potential contribution of groups (proposed ex-ante) made by the core and periphery countries. For this part of the analysis we define the core countries as a group that keeps a relatively higher level of productivity measures, macroeconomic policy consistency and fiscal sustainability with respect to the global crisis and also to a long-term perspective in comparison to the rest of the EU. Recently, instead of using the designation of the core, the term "*austerity and competitive north of Europe"* is often used in literature. For the purpose of trying to detect some aspects of CEECs' contribution to the insider-outsider constellation with respect to the EMU, we include only the Eurozone members in the core group. Thus in our analysis the core includes Austria, Belgium, Germany, Finland, France and the Netherlands. Periphery countries have especially lower

[6] See Artis and Zhang (2001), Boreiko (2003), Camacho et al. (2006, 2008) or Song and Wang (2008) and Qauh and Crowley (2010), who focused on clustering East-Asian countries.

competitiveness measures, macroeconomic policy inconsistency and also difficulties with public finances' sustainability in common. Therefore, the periphery cluster is made up of Portugal, Italy[7], Greece and Spain. Moreover, we decided to also include Ireland, in particular, because of the current context of the global crisis.

In our view, an assessment of aggregate EU heterogeneity using one or few composite indicators (such as GDP correlation, etc.) might lead to a simplified and inaccurate interpretation to a certain extent. Similar to Saraceno and Keck (2010) and König and Ohr (2012), we rather apply a multi-dimensional approach to cluster analysis to capture some unique details related to heterogeneity development in different areas of research interest. Five thematic domains containing related indicators were selected to examine heterogeneity in the EU from different perspectives. The initial data sample was reduced to a final shape, as shown in table 1, due to multicollinearity testing. Highly correlated measures (as suggested, e.g., by Dormann, 2012) were excluded from the sample. Consequently, variables were transformed into an index *I* representing the country's position relative to the rest of the sample of countries using the following formula

$$I_{i,t} = \frac{v_{i,\,t}}{WAVG(v_t)} \qquad (1)$$

Where *v* represents a respective variable, *i* stands for a country in the time period *t,* and *WAVG* is the weighted average of the particular variable composed of the rest of the EU countries – excluding the i^{th} country, weights being the i^{th} country's GDP. Index *I* can be used to describe the contribution of a country to the level of heterogeneity within the EU and, hence, to provide information on the integration process in the EU. A country's position is given when compared to the average. A value greater than 1 implies that the country is above EU average, while a value smaller than 1 means a below-average result. The distance from the average reflects the degree of heterogeneity: the further the value from 1 the higher the degree of heterogeneity. In addition to that, the direction of deviation matters, since it helps us distinguish between above- and below-average countries.

As the indices can range from zero to theoretical infinity, all indices were normalized applying the formula

$$N_{i,t} = \frac{I_{i,\,t} - MIN(I_T)}{MAX(I_T) - MIN(I_T)}, \qquad (2)$$

to preserve the equal impact of all indices. Where *I* is the value of the index in time period *t*. $MAX(I_T)$ $(MIN(I_T))$ represents a maximal (minimal) value of the index during the whole time span *T,* respectively, which returns the value of each index within the range 0-1 and has lower sensitivity to extreme values[8].

[7] In our opinion, Italy belongs to the periphery group mainly due to its long-term negative trends of losing competitiveness, rising public debt, economic stagnation and weak governance. In addition to that, Italy was hit by the debt crisis, which led to reaching over a level of 6% of government bond interest rates as well as repeated speculations of a bailout. In recent literature the term GIIPS is also used for periphery countries including Italy.

[8] Although a method of standardisation (i.e. the transformation of indices so that they have a mean 0 and variance 1, proposed for example by Tryfos, 1998) can be used for the purpose of an equal impact of all variables employed in the cluster analysis; in our case it does not reduce the problem of unequal contribution since some variables with larger

Having normalized the indices, t cluster analysis was applied in order to examine EU heterogeneity and its evolution in five thematic dimensions, as explained in the introductory section of this paper. The final indicators comprised in the dimensions are presented in table 1.

Table 1: Dimensions and indicators

Dimension	Variable	Unit	Source
1 – governance and institutions	Political Stability and Absence of Violence	<–2.5, 2.5>	World Bank
	Property Rights	<0, 100>	Heritage
	Business Freedom	<0, 100>	Heritage
2 – macroeconomic policy harmonisation	Total General Government Expenditure	% of GDP	Eurostat
	Implicit Tax Rate on Labour	%	Eurostat
	Official Lending Rates	%	Eurostat
	Money and Quasi Money (M2)	% of GDP	World Bank
3 – single market and openness	Intra-European Trade[9]	%	Eurostat
	Grubel-Lloyd Index	%	Eurostat, own calculations
	Market Integration - Foreign Direct Investment Intensity	%	Eurostat
	Labour Migration	%	Eurostat
4 – symmetry and convergence	Growth Business Cycle (GDP)	<-1, 1>	Eurostat, own calculations
	Growth Business Cycle (IP)	<-1, 1>	Eurostat, own calculations
	HICP	<-1, 1>	Eurostat, own calculations
5 – competitiveness	Labour Productivity[10]	EU27 = 100	Eurostat
	Real Effective Exchange Rate[11]	1996=100	Eurostat
	Persons with Upper Secondary or Tertiary Education Attainment	% of total population	Eurostat
	Total Intramural R&D Expenditure (GERD)	% of GDP	Eurostat

1) Applying the Governance and Institutions dimension we aim to examine the current and changing heterogeneity of the EU from the perspective of the governance quality and institutional environment in EU member countries. The indicator of Political Stability and Absence of Violence

values still dominate, which could bias the results. As a consequence, we prefer normalisation of indices according to the abovementioned formula.

[9] imports and exports of goods and services as a percent of total trade in goods and services

[10] based on PPS per hours worked

[11] deflator: consumer price indices - 27 trading partners

taken from the World Bank reflects the perceptions of the likelihood that the government will be destabilized by unconstitutional or violent means; in fact, it monitors such events as armed conflict, violent demonstrations, social unrest, ethnic conflicts, terrorist threats, and so on. Regarding governance and institutions' quality, we use the indicators on Property Rights and Business Freedom published by the Heritage database[12]. The Heritage Foundation establishes the Property Rights measures to assess the ability of individuals to accumulate private property, secured by clear laws fully enforced by the government. The Business Freedom measure is set as the overall indicator evaluating another essential area of governance in market economies – to create favourable conditions for private enterprise.[13]

2) The Macroeconomic Policy Harmonisation dimension is designed to describe the monetary and fiscal policy mix harmonisation process in the EU. The dimension contains two fiscal and two monetary measures. The Total Government Expenditures as a percentage of GDP is a measure that is not included in the set of Maastricht criteria. In fact there are differences across Europe in that measure since, for instance, Denmark and Sweden re-distribute around 50-60% of their GDP, whereas Estonia only 30%. These countries have no problems with keeping fiscal sustainability. In including this criterion into the dimension and also analysing the fiscal dimension separately in the sensitivity analysis we aim to identify the current level of fiscal heterogeneity with regards to the current debate on the need for a common fiscal policy. Consecutively, the Implicit Tax Rate on Labour provided by Eurostat is interesting for us since this measure is also not explicitly determined by the Growth and Stability Pact, neither is its actual modification in the form of the European Fiscal Compact signed in 2012. Thus it can be to a certain extent operated independently by national governments. Therefore, including the Labour Tax into the analysis contributes to accessing the tax harmonisation processes in the EU. Monetary policy harmonisation is examined using the Money and Quasi Money (M2) and Official Lending Rates provided by the Eurostat[14]. Considering the explicit commitment of all new EU member states, including the CEECs, to strive for monetary integration and keep joint fiscal discipline, one would expect to see decreasing heterogeneity implying strong integration processes till the crisis period across the EU at least. However, the uneven impact of crises upon particular European economies revealed the problems of structural dissimilarity[15] of economies and a different approach to the joint policy harmonisation effort in the EU and even the Euro area. Analysing this dimension we particularly intend to focus on the problem of insider and outsider EMU constellation and the role of CEE countries. In addition, we would like to provide some evidence of a current heterogeneity level and the position of CEECs, taking into account criteria excluded from the supranational supervision, i.e. Maastricht criteria and the European Fiscal Compact.

3) The Single Market and Openness dimension is based on the fundamental idea of European Integration to eliminate trade barriers among countries to create a large common market. From this point of view we particularly focus on examining Intra-European trade measuring the total

[12] The Heritage Database – Index of Economic Freedom 2013

[13] For a full definitive version, see the Heritage – Index of Economic Freedom 2013 available at http://www.heritage.org/index/

[14] The Official Lending Rates represent a marginal lending facility vis-à-vis the banking sector, representing the ceiling for movements in short-term money market rates (Source: Eurostat).

[15] For impacts of structural differences among the EU countries in crisis, see Archibugi and Filippetti (2011).

trade intensity between a particular EU country and the rest of the EU. Following the suggestions by Fidrmuc (2004), Kandogan (2006) or Gabrish (2009), arguing that business cycle similarity is influenced by the structure of trade rather than its intensity, we employ the indicator of intra-industry trade measured by applying the Grubel Lloyd index

$$GL_t = 1 - \frac{\sum_k \sum_i \left| X_{it}^k - M_{it}^k \right|}{\sum_k \sum_i \left| X_{it}^k + M_{it}^k \right|}, \quad (1)$$

GL_t represents a ratio of the absolute value of intra-industry trade to total foreign trade. X^k_{it} and M^k_{it} are the values of exports and imports of commodity *i* produced in country *k* in the time period *t*. The index ranges from 0 (indicating a complete lack of intra-industry trade and the existence of inter-industry trade only, implying specialisation in different commodities) to 1 (meaning fully integrated foreign trade and the presence of intra-industry trade solely).

Apart from the intra EU related indicators we also examined the general openness of EU countries, measured through Foreign Direct Investment flows and Labour Migration. For this reason we applied the foreign market investment intensity indicator measured as an average value of inward and outward Foreign Direct Investment flows (in % of GDP, multiplied by 100). As a Labour Migration measure we use the percentage of foreigners working in an EU country (following the ILO definition)[16]. The principles of the Common European Market came into existence in 1992 after adopting the Single European Act in 1987. Since then a lot of barriers to free trade flows have been eliminated. Also the new EU member states entering the EU in 2004 and later could benefit from an enlarged single market from the very beginning of their membership. Accordingly, we expect the European Union to be highly integrated in trade and openness with a low level of heterogeneity implying a low average distance and variance of estimated clusters.

4) In considering the expected EMU integration of the CEECs in the future, we employ the dimension of Symmetry and Convergence. The business cycle and shock similarity reflect the "new" Optimum Currency Area theory criteria[17]. We employ various indicators of business cycle similarity. In particular, the 5-year rolling window coefficients, based on quarterly GDP and Industrial Production (IP), detrended by the Christiano-Fitzgerald filter, are used in the analysis. Also the rolling correlation coefficients of the Harmonized Indices of Consumer Prices (HICP), based on monthly data, complete the set of similarity indicators. In considering the OCA endogeneity hypothesis, we assume increasing similarity of business cycle over time across the EU due to rising integration. As regards the convergence measure, we assume the gap between the EU core, periphery and CEE countries to diminish over time, mainly in the 2000-2008 period. There is also the question whether the CEECs appear as an internally homogenous cluster in the periods analysed. In addition to that, the uneven impact of the crisis might negatively influence the business cycle similarity, as suggested by Hallet and Richter (2012) or Gächter et al. (2012).

5) Higher competitiveness of the EU economy as a whole, compared to large world economies such as the US, Japan, or currently also the BRICS countries, belongs to the main expected

[16] The measure capturing all foreigners in the EU countries was used due to low data availability of intra-EU labour mobility indicators, especially for CEE countries.

[17] For recent results of the business cycle and shock symmetry in the EU see, for instance ,Altavilla (2004), Kalemli-Ozcan et al. (2010), Mink et al. (2012).

benefits of the European integration process. In fact, the differences in competitiveness of individual EU states are often discussed in literature (De Grauwe, 2012). The increasing gap between countries with higher competitiveness towards the north of Europe and those closer to the south is becoming more obvious. Naturally, we also employ the competitiveness dimension in the analysis to examine the current level of heterogeneity among the EU states and to concentrate on the position of the CEE countries. Apart from traditional competitiveness indicators such as Labour Productivity, Real Effective Exchange Rate (REER) and Unit Labour Costs[18], the knowledge based economy indicators were also employed. These include Educational Attainment and the Total Intramural Research and Development Expenditures (GERD). Educational Attainment is measured by the percentage of persons attaining upper secondary or tertiary education in particular countries and years.

3. Discussion on transition and integration strategies of the CEE countries

Focusing on the integration strategies and processes during the transition period of CEE countries, we should start with a definition of how we approach the term CEE countries in this text. First of all, these countries had less or more centrally-planned economies till late 1980s. It means they had an economic system where the government owned and managed a vast majority of production facilities and where prices and wages were not determined by supply and demand. Second of all, these countries had a common general aim in the early 1990s: a transition to a more effective economic system, based on principles of market economy, enabling a growth of living standards.

Generally, we can talk about the same direction of transition, however, regarding particular features of transition strategies, there were many ambiguous questions: Firstly, where to head specifically? Towards a social market economy, a Scandinavian type of welfare state, the Anglo-Saxon model or the Eastern model of market economy? Secondly, how fast to transform the economic system? Using a shock therapy or rather a gradualism approach?

Moreover, the initial transition intentions were often modified soon, in dependence on:

- economic level (more developed Western CEE vs. less developed Eastern CEE)
- historical experience with democracy and market economy (Western CEE vs. Eastern CEE)
- quality of informal institutions (culture, social capital)
- level of transformation in the 1980s (more liberal Poland, Hungary, Slovenia vs. strictly centralized Czecho-Slovakia, Bulgaria)
- first results of transition (a relative success vs. failure)
- reaction of citizens (acceptance of first negative impacts of reforms vs. refusal of the whole transition process and re-sentiment for the socialist era)
- consistency of economy policies, etc.

Analysing the situation in particular CEE countries, we can assume that social-economic development was rather heterogeneous during the transition period. In a long-term perspective,

[18] The ULC indicators had to be excluded from the final analysis due to low data availability and comparability.

evaluating the overall success of the transition process in Central and Eastern Europe shows the existence of two main groups of countries. Accession into the EU as a part of the so-called first wave in 2004 may serve as a clear-cut criterion for dividing the groups. The Visegrad Four, dynamically growing Baltic countries and the wealthiest country in the region, Slovenia, unquestionably converge quantitatively and qualitatively with developed countries in Western Europe over the long-term. Their entry into the EU gives high credibility to their success in social and economic transition. The level of transition achieved (economic development, character of institutions, stability of democracy, development of civil society, etc.) in most of Balkan and post-Soviet countries, which form the second main group of CEE countries, is at a markedly lower level than in the *successful* group. On the boundary line between the two groups, Bulgaria and Romania, lie countries whose accession to the EU in 2007 is possible to consider rather as an incentive for the successful completion of the transition process than as a reward for the level of transition attained. Another specific case is Croatia, differing from all other non-member countries in the former Eastern Bloc regarding its level of social-economic development, moreover, with a real prospect of accession. Therefore, Bulgaria, Romania and Croatia form in fact the third group of CEE countries.[19]

In addition to the heterogeneity level within the broad group of the CEE countries, in this paper we shall cope also with the fact of a rather long time period and a wide spectrum of topics related to the transition and integration processes. In order to identify and analyse the integration strategies, we applied three selection criteria for the analysis:

1. selection of transition countries
   - criterion: accession to the EU in 2004
     - successful countries (Visegrad, Baltics, Slovenia)
     - "between the groups" (Bulgaria, Romania, Croatia)
     - less successful countries (Balkan, Post-soviet region)
2. selection of periods
   - 1990s – "transition period" (in the qualitative analysis)
   - 2000s – "integration period" (particularly in the quantitative analysis)
3. selection of research areas
   - governance and institutions
   - macroeconomic policy harmonization
   - single market and openness
   - symmetry and convergence
   - competitiveness

In the paper we deal with the first two groups of countries, it means in total with eleven countries of the CEE country group. However, because of the lack of data, Croatia is included only partially in this qualitative analysis. As far as the second criterion is concerned, in this part, we focus especially on the 1990s, when the transition and integration strategies were formulated and implemented, nevertheless, with logical overlaps to the 2000s when the *successful* countries

[19] Based on results of transition, Aslund (2008) distinguishes among three group of CEE countries: radical reformers (Central Europe, the Baltics) x gradual reformers (South-Eastern Europe, most of the post-Soviet states) x countries that have maintained old dictatorship (Belarus, Turkmenistan, Uzbekistan).

Similarly, Lane and Myant (2007) state three groups of post-communist countries: fairly successful transition countries (explicitly Estonia, Slovenia, Eastern Germany, the Czech Republic, Poland, Ukraine) x hybrid economies (Russia, Kazakhstan, Georgia, the Western Balkans) x statist societies (Belarus, China).

entered the EU. As regards the third criterion, in this part we deal particularly with the first dimension since political and institutional development was determining transition and integration strategies and their implementation. In terms of the other dimensions, a generalizing summary of main macroeconomic policy trends in the CEE countries is provided.

3.1 Political and institutional environment: a key to the transition and integration strategies and their successfulness

Discussing the integration strategies of CEE countries in a long-term perspective, it is necessary to emphasize that these were, to a large degree, determined by the transition strategies chosen already shortly after the fall of the communist regime. Comparing it with the causality of transition processes in other parts of world, the sequence of political and economic changes in Central and Eastern Europe was rather untypical. In particular, most of the successful Asian countries experienced economic reforms accompanied by economic growth at first, later on by political liberalization and democratization (Taiwan, Korea, Malaysia, Indonesia, however, China and Vietnam as well). As, e.g., Zakaria (2004) argues, a country must become rich at first; an educated middle class grows up which starts to demand democratic reforms. Central and Eastern Europe experienced an inversed course of changes: falls of autocratic regimes, the birth of democracy and only then implementation of vast economic reforms. Orenstein (2001:3) states three particular factors of this development: firstly, the forceful personalities at the head of the opposition such as Lech Walesa in Poland or Václav Havel in the former Czechoslovakia; secondly, a democratic tradition (or we say a tradition of relatively liberal policies) of most countries in the region, especially from the interwar period; thirdly, the strong impact of the European Union on adherence to the principles of democracy. In this context Aslund (2008) even claims that the accession to the EU boosted democracy much more than economic growth. As regards this debate on causalities in terms of political and economic changes, we should add the argument that at least Central European (*successful*) countries were relatively developed already at the beginning of the transition process. Realizing the fact that Slovenia, Czechoslovakia or Hungary belonged to the middle-income countries in the late 1980s, the abovementioned ideas are not contradictory. Moreover, these initial conditions at the outset of transition were fundamental to the success of transition and integration strategies.

Analysing the literature on the transition process of CEE countries, we can summarize a list of political, institutional and economic features that, in our opinion, considerably determined the success of transition and integration strategies in the CEE countries:

- political stability
    - e.g., Grochova and Kouba (2011): only elite political instability (all successful countries) vs. non-elite political instability (former Yugoslavia, Georgia, Ukraine)
- formal (political) institutions
    - democratic elections (all successful countries) vs. autocratic tendencies (Serbia, Belarus, Ukraine, Georgia, Central Asia)
    - parliamentary system (all successful countries except Romania) vs. presidential system (Russia, Belarus, Ukraine, Georgia, Central Asia); (e.g., Novotna, 2011)
    - proportional election system (all successful countries) vs. majoritarian election system; (e.g., Novotna, 2011)

- informal institutions
    - e.g., Zweynert and Goldschmidt (2005): extended order based on Western Christianity tradition (all successful countries) vs. holistic order based on Eastern Christianity tradition (Balkan and Post-soviet countries)
    - their compatibility with formal institutions, according to North (1990)
- economic level
- real prospect of accession to the European union

Generally, political stability is considered to be the essential prerequisite for successful economic development, e.g., Alesina et al (1996), Jong-A-Pin (2009), Aisen and Veiga (2013). Nevertheless, the literature based on the ideas of new political economy usually doesn't distinguish between two levels of political instability, so-called elite and non-elite political instability. While non-elite political instability concerns violent coups, riots or civil wars, elite political instability covers "soft changes" such as government breakdowns, fragile majority or minority governments. Inspired by Gyimah-Brempong and Dapaah (1996), who used the conception elite vs. non-elite political instability in the case of Sub-Saharan Africa in Grochova and Kouba (2011), we applied this perspective on political instability in the case of CEE countries. Exploring, e.g., the durability of governments, we can see that in the period 1993-2008, Poland and Latvia experienced 16 different governments, Estonia and Lithuania no fewer than 11 different governments. Furthermore, all governments in the Czech Republic between 1996 and 2010 were extremely weak and unstable, similarly, both Slovak pro-reform governments under the prime-minister Dzurinda in the period 1998-2006, etc. Thus, we can generalize – all these *successful* CEE countries suffered from considerable features of elite political instability during the transition period; despite it, they experienced fast economic growth and achieved their main goal – accession to the European Union. On the other hand, all these *successful* countries managed to avoid symptoms of non-elite political instability. And here we can see an important difference between our main groups – *successful* and *less successful* countries. An illustrative example is the totally different course of separation in Czechoslovakia compared with Yugoslavia. Moreover, Croatia, which was initially perceived as a very promising candidate for a fast integration into the European structures, lost its chance for progress in integration in the 1990s just because of non-elite political instability (war, autocratic regime). Only after the end of violent conflict in post-Yugoslavian area, furthermore, after the fall of Tudman's autocratic regime in 2002, Croatia managed to carry out a fast and successful integration process. Therefore, we can claim: non-elite political stability was the first precondition for prosperous implementation of transition and integration strategies.

As regards the set of formal institutions having political character, the literature of new political economy extensively discusses the significance of a political regime for economic development. Moreover, this question started to be popular particularly in the 1990s just because of the geopolitical changes that were related to the collapse of the Soviet bloc and the democratization process in the CEE region, e.g., Alesina and Perotti (1994), Clague (1997), Olson (2000), Lindert (2003). In a general perspective, the results of this strand of research are rather ambiguous – both democratic and autocratic states can prosper in the long run, both of them can experience long-term economic decline. Nevertheless, in the prospect of CEE countries aiming for the integration into the community of developed Western countries, democracy was an imperative condition. For this reason, it is beneficial to point out the character of political institutions in *successful* democratic countries. As Novotna (2011) summarizes, all *successful* countries

decided for parliamentary democracy and a proportional election system in the early 1990s.[20] In traditional western democracies, of course, there exist various combinations of political system (parliamentary – presidential, proportional – majoritarian election system, mono-cameralism – bi-cameralism and so on). However, the abovementioned examples of post-Soviet and Balkan countries that decided for majoritarian election systems and particularly for a strong institution of presidency could warn: after (long) periods of autocratic regimes, it is highly recommendable to avoid political institutions based on a "winner takes all" principle. In other words, we can imply that the selection of parliamentary democracy with a proportional election system was another crucial part of (successful) transition and integration strategies.

While the essential change of formal institutions, both political and economic, was in fact the core of transition, the authors of transition strategies had to take the post-socialistic state of informal institutions into account as well. In the last two decades, the most cited conception of an institution is Douglas North's one (1990:3): *"Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction."* Nevertheless, discussing the role of informal institutions, we tend to use another of North's reformulations (1990:4): *"formal written rules as well as typically unwritten conduct of behaviour that underlie and supplement formal rules."* Informal institutions themselves are usually explained as norms, habits, conventions, customs, traditions, taboos, values, ways of thinking, codes of behaviour and so on. We prefer the latter North definition since it comprises his crucial requirement for compatibility between formal and informal institutions. Moreover, it enables us to cover also behavioural practices that could be from our point of view hardly separated from norms or values. In the contemporary literature of new institutional economics, there is also a line of research dealing with the relationship between informal institutions and economic development, e.g., Knowles and Wheaterston (2006), De Soysa and Jūtting (2007), Foa (2008), Hansen (2013). Furthermore, there is a strand of growth theory of new institutional economics emphasizing the importance of compatibility between formal and informal institutions, besides North (1990), e.g., Mantzavinos (2001) or Williamson (2009) and in fact also influential papers by Greif (1993) and Tabellini (2010), who, however, use the term culture instead of informal institutions.

Compatibility between formal and informal institutions is an extraordinarily important issue just in the case of the CEE transition economies, since the CEE countries adopted a formal institutional framework of Western democratic market economies during a very short period. This begs the question whether (or to what extent) people in the CEE countries were able and willing to think and behave according to Western formal rules. Within this context, we can mention the papers by Zweynert and Goldschmitd (2005) or Kouba (2010). In Kouba (2010), we use North's concept for a component explanation of the unsuccess of the transition process in the former German Democratic Republic. Zweynert and Goldschmitd (2005) apply North's concept for dividing the CEE countries into two groups in a similar way to our approach. They distinguish between *Latin* countries with a Western Christianity tradition (Central Europe and Baltic states as well) and Eastern countries with strong holistic *Orthodox* tradition. Zweynert and Goldschmitd claim that societies in Latin countries historically showed substantial progress towards *extended order* (which is typical for Western European countries). Therefore, during the period of communist

[20] Furthermore, within the whole group of new EU member states, only in the Romanian case can we talk about a semi-presidential system.

regimes, their informal institutions were more resistant to incompatible formal institutions introduced in Central and Eastern Europe from the Soviet Union. Moreover, these informal institutions were more compatible with the Western formal rules during the transition period. The argumentation on *extended order* in *Latin* countries made by Zweynert and Goldschmitd is an analogy to our group of *successful* countries – these had historical cultural ties to the West or, in other words, educated societies with relatively mature informal institutions. On the other hand, in many *less successful* or *orthodox* Eastern countries, people after a short time refused reforms in a convincing way and started to demand a strong government with often autocratic tendencies again. Concluding, historical experience with democracy and informal institutions relatively adaptable to Western formal institutions belonged to the key prerequisites for prosperous implementation of transition and integration strategies in the CEE countries.

Following the discussion on institutions in CEE countries, it is necessary to stress that their quality is not exogenous in relation to economic development. Therefore, we can imply that initial economic level of particular CEE countries was another important determinant of successful transition and integration into the European structures. Based on available data, the following table shows that successful countries were relatively more developed already on the threshold of transition.

Table 2: GNI per capita (PPP, US dollars)

Country	1990	1995	2000	2010
Austria	19 152	23 116	28 417	40 307
Albania	2 822	2 980	4 378	8 559
Belarus	4 645	3 404	5 135	13 560
Bulgaria	4 973	5 346	6 069	13 455
Czech Republic	11 518[21]	13 385	15 279	23 456
Estonia	:	6 318	9 559	18 971
Hungary	8 538	8 678	11 292	19 725
Latvia	7 813	5 410	8 019	16 280
Lithuania	9 311	6 187	8 468	17 973
Macedonia, FYR	5 491	4 756	5 827	11 177
Poland	5 713[22]	7 300	10 476	19 311
Romania	5 167	5 329	5 618	14 602
Slovak Republic	7 703	8 336	10 945	21 772
Slovenia	10 439	13 114	17 567	26 118
Turkey	4 344	5 270	9 123	15 675
Ukraine	5 955	3 121	3 180	6 580

Source: World bank

And last but not least, another crucial determinant of successful implementation of transition and integration strategies was, of course, the permanent pressure by the European Union. In

[21] 1992

[22] 1992

particular, it was an extraordinarily strong incentive for consistent reformatory policies in the case of these CEE countries that had a real perspective of accession into the EU.

Comparing it with the relevance of political and institutional factors, in our opinion, economic policies themselves, both in the 1980s and the reform strategies designed in the early 1990s, were in fact much less important for the long-term successfulness of CEE transition and integration strategies:

- level of transformation in the 1980s
    - more liberal policies (Poland, Hungary, Yugoslavia) vs. strictly centralized economies (Czechoslovakia, Bulgaria, the Soviet Union)
- strategies of economic transition
    - Aslund (2008): shock therapy: (Poland, the Czech Republic, the Baltic states; Russia supported) vs. gradualism (Hungary, south-eastern Europe, most of the Soviet Union)
    - Orenstein (2001): shock therapy (Poland) vs. social liberalism (the Czech Republic)

As regards particular economic policies in the 1980s, these seem to be relatively irrelevant in terms of their impact on the course of the transition and integration period. In particular, Hungary and Poland were often stated as examples of countries that implemented a lot of liberal reforms in the 1980s, such as the abolition of binding central plans, partial price liberalization or freedom of business, and these reforms were often interpreted as a comparative advantage. On the other hand, in the 1980s former Czechoslovakia belonged to the most centralized countries from all over the world.[23] Despite this fact, both the Czech Republic and Slovakia were ranked among the most successful countries within the transition period. Furthermore, the most liberal Yugoslavian economy was not by far a sufficient condition for the prosperous course of transition in post-Yugoslavian republics (except for Slovenia). Table 3 summarizes the development of the private sector share in the CEECs according to the EBRD data.

Table 3: Private sector share (% of GDP)

Country	1990	1995	2000	2010
Bulgaria	10	50	70	75[24]
Czech Republic	10	70	80	80[25]
Estonia	10	65	75	80
Hungary	25	60	80	80
Latvia	10	55	65	70
Lithuania	10	65	70	75
Poland	30	60	70	75
Romania	15	45	60	70
Slovak Republic	10	60	80	80
Slovenia	15	50	65	70

Source: EBRD

As far as the initial conditions of CEE countries and their influence were relatively frequently discussed, in the case of transition strategies, there is extraordinarily vast literature analysing and

[23] According to Tošovský (2000), only 2 % of Czechoslovak national income in the 1980s was produced in the private sector.

[24] 2007

[25] 2007

identifying various transition strategies and discussing their implementation and results. First of all, we shall mention the strand focused on the question of whether to choose shock therapy or a gradualist approach to reforms, e.g., Roland (1994), Hoen (1996) or Popov (2007). As regards inclusion of CEE countries into particular categories, e.g., Aslund (2008) provides a relatively common – abovementioned – categorization. At first sight, the countries having implemented shock therapy seem to be more successful, however, in the long run, at least Hungary from the latter group belongs into the group of *successful* countries without any doubt. In addition to that, also the categorization of single countries into particular groups is far from an unambiguous consensus. E.g., Orenstein (2001) labels reforms in the Czech Republic as *social liberal* and confronts them with *shock therapy* in Poland. And finally, the transition and integration strategies were implemented in the CEECs over two decades, thus, the original strategies were repeatedly modified in dependence on actual economic development, government changes and so on.

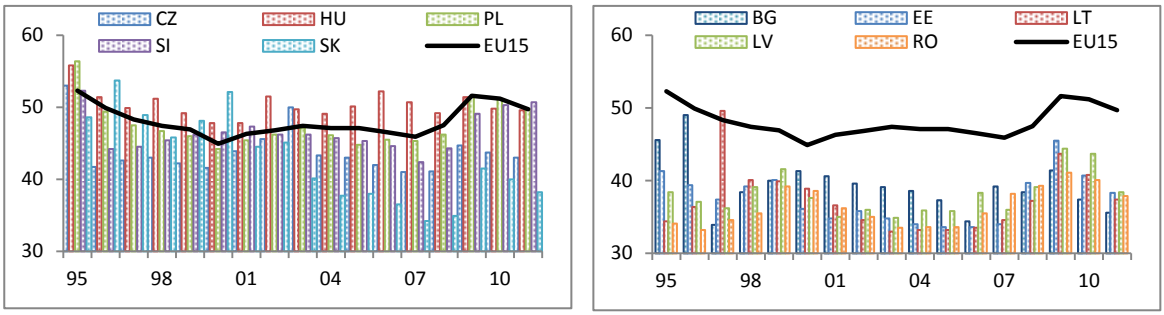
Therefore we imply: in a long perspective, the ex-ante strategies of economic transition themselves and individual economic policies in partial stages as well were not essential for the successfulness of integration process. In our persuasion, the main determinants of the course and result of the integration process in Central and Eastern Europe were the level of (non-elite) political stability, quality of institutional framework, maturity and compatibility of informal institutions and initial economic level. The countries having reached positive features within these four categories were predestined to become members of the European Union.

3.2 Macroeconomic policy trends in the transition and integration period of CEE countries

Let's have a look now at main macroeconomic policy trends in the transition and integration period. Analysing fiscal policies, former centrally-planned economies in Central and Eastern Europe have redistributed a lower share of their GDPs and have managed to keep lower public debts in comparison with stable Western market economies.

The available dataset dealing with public finance indicators in CEECs starts with the data for 1995. As regards the ratio of government expenditures to GDP, only Hungary, Poland and Slovenia approach the EU15 average in the long run. Figure 1 indicates also the impact of the financial and economic crisis on public finance of particular countries. It is possible to identify a few swings such as the Bulgarian case in 1996, when the country experienced a simultaneous banking crisis, currency crisis and public finance crisis. Apart from these crises effects, the most significant purposeful change in policy trend can be identified in the case of Slovakia where the government expenditure ratio decreased between 2001 and 2007 by roughly 15 % as a consequence of the Slovak liberal policy of Dzurinda's reformatory governments. This Slovakian case can also be interpreted as the most visible example of a general trend within transition and integration strategies: in order to sustain their competitive advantage within the convergence process, the CEE countries enabled keeping relatively low taxes and thus a low level of redistribution as well.

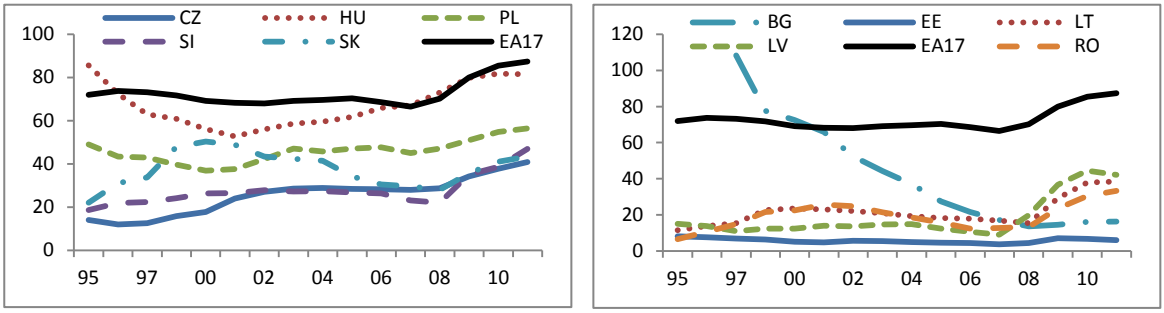
Figure 1: Total general government expenditure (% GDP)



Source: Eurostat

In terms of public debt, unfortunately, the applicable dataset starts also with the 1995 data, which does not explicitly show the situation of CEECs on the threshold of transition. Despite this weakness, the subsequent figure suggests the fact that Hungary and Poland inherited higher indebtedness already from the communist period. On the contrary, all other CEE countries started their transition and integration process with a very low public debt level, less than 25% of GDP. On the other hand, a mildly growing trend with acceleration in the period of financial and economic crisis is typical for the whole CEE region. On the contrary, Bulgaria is a unique case because of its unprecedented fall of public debt after the crisis in 1996, furthermore, the power of Bulgarian rigidly restrictive policies proved after 2008 when the country sustained its fiscal stability, unlike Romania or the Baltic states. Nevertheless, just in the Baltic region we find another Eastern European solitaire concerning austerity – Estonia, which permanently belongs together with Luxemburg as the couple of least indebted states in Europe.

Figure 2: Government consolidated gross debt in the CEECs (% GDP)



Source: Eurostat

If in the case of transition and integration strategies on fiscal policy it is possible to identify some common trends in the group of CEE countries, the development in the monetary area was fully heterogeneous. Only in the early phase of transition, monetary policy in the whole of Central and Eastern Europe was focused on the struggle against the consequences of price liberalization. After that, during the whole integration period, the single CEECs implemented a broad range of either discretionary or rule-oriented monetary policies, resuming in the following table.

Table 4: Monetary policy regimes in the CEECs

Country	Monetary policy regime
BG	since 1997 currency board
CZ	1994–1997 exchange rate and monetary base targeting; since 1998 inflation targeting
EE	exchange rate targeting; since the 2011 Euro system
HR	since 1994 exchange rate targeting
HU	1994–2001 exchange rate targeting; since 2001 inflation targeting
LT	exchange rate targeting
LV	exchange rate targeting
PL	1994–1998 exchange rate targeting; since 1998 inflation targeting
RO	exchange rate targeting; since 2005 inflation targeting
SI	1995–2001 exchange rate and monetary base targeting; 2001–2006 inflation targeting; since the 2007 Euro system
SK	1994–1998 exchange rate targeting; 1998–2008 inflation targeting; since the 2009 Euro system

Source: Gnan et al. (2005), Vašíček (2009), Ziegler (2012)

The previous statement on heterogeneity in monetary area is even more apparent in the case of exchange rate policies in CEECs. While the transition period was, in particular, under the sign of more or less fast deregulation of exchange rates in connection with liberalization of both current and capital account, after assurance on acceptance to the European Union the particular countries implemented miscellaneous exchange rate policies. As regards their results, nowadays, Slovenia, Slovakia and Estonia are members of the Eurozone, on the contrary, Bulgaria, Czech Republic and Hungary have not set a date for Euro adoption yet.

Table 5: Exchange rate regimes in the CEECs

Country	Exchange rate regime	Declared accession to EMU
LT	ERM II	no date; ASAP
LV	ERM II	2014
BG	currency board	no date
CZ	managed floating	no date
RO	managed floating	2014
HU	free floating	no date
PL	free floating	no date; government priority

Source: European Commission (2012b), ECB (2012)

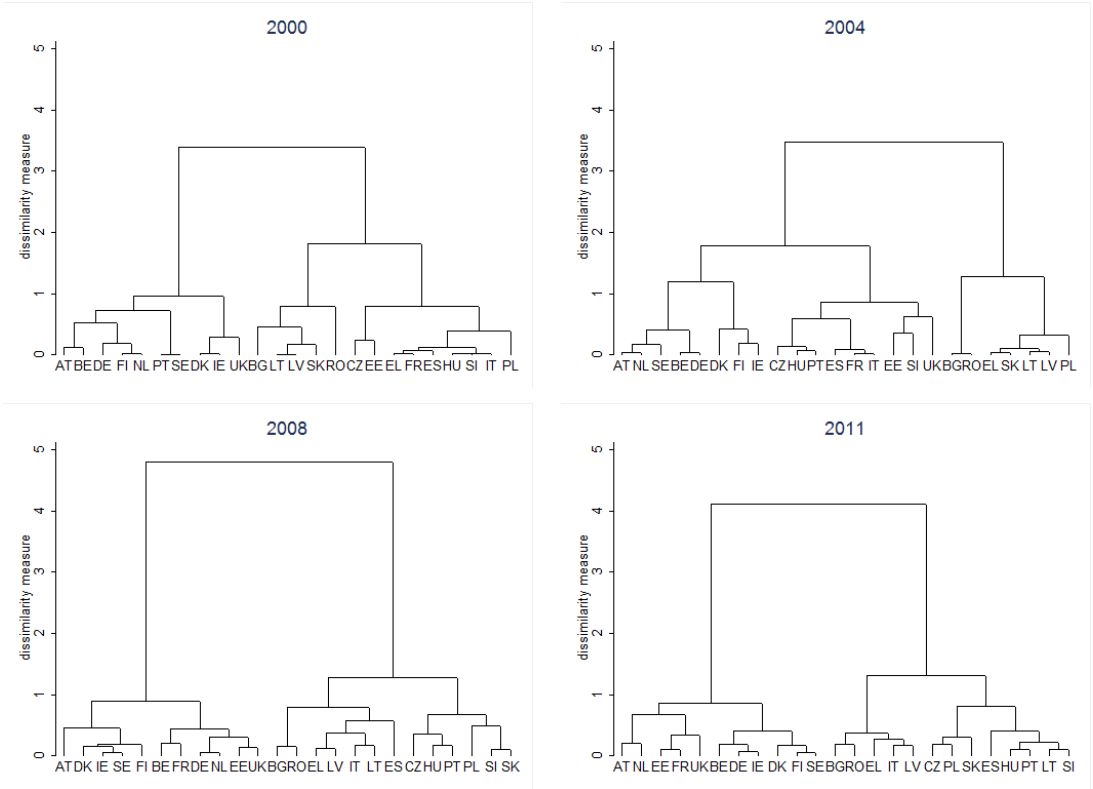
In the next chapter, a finer optics focused on the policies and outputs of the CEE countries will be applied within the cluster analysis aimed at the integration period after 2000.

4. Empirical results

4.1 EU heterogeneity: Identification of clusters

The first part of the cluster analysis is focused on the identification of clusters and their structure in selected dimensions composed of socio-economic indicators. The changing structure and relative homogeneity level is examined in four consecutive years from between the 2000-2011 period. The results described in the dendrograms should contribute to answering the questions to what extent the EU countries make common clusters, what are the usual outliers and what is the position of CEE countries. Comparing the clustering structure in four forthcoming years provides some evidence of the evolution of clusters over time.

Figure 3: Clustering in the dimension of Governance and Institutions

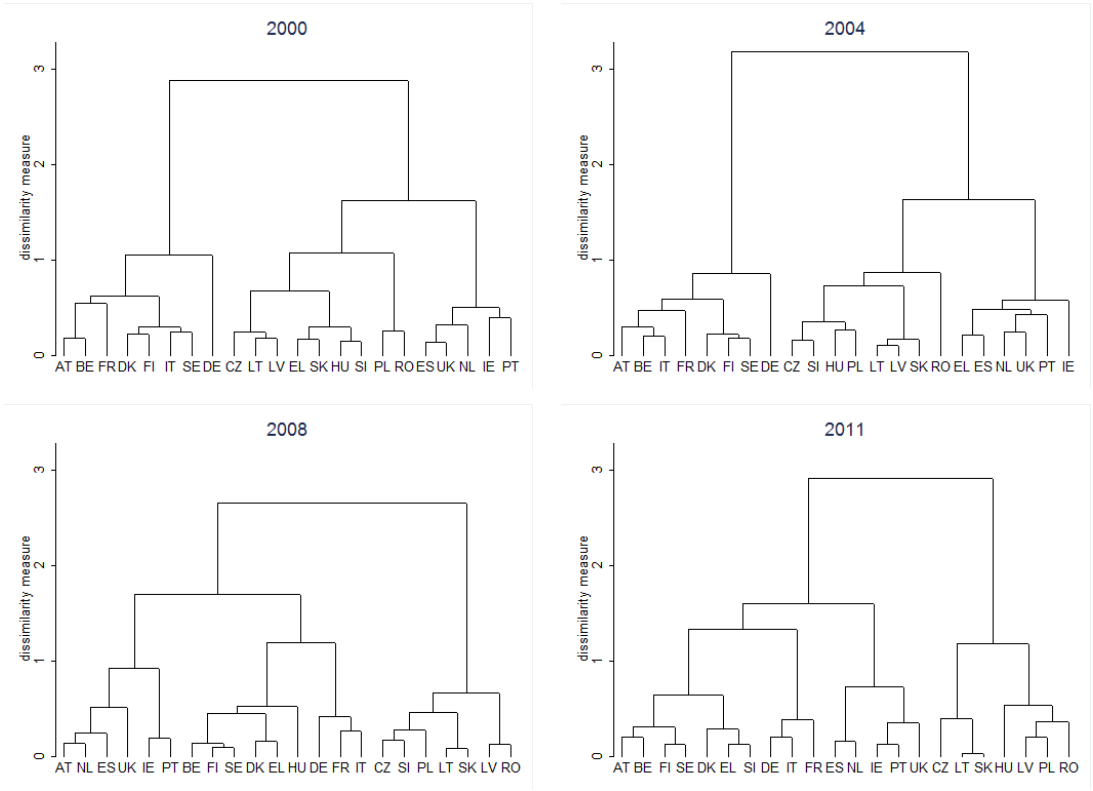


Source: Authors' calculations

As regards the dimension of Governance and Institutions, we are able to identify a priori predictable distribution of clusters which is, moreover, relatively stable over the whole analysed period. Analysing particularly legal framework (indicator Property Rights) and conditions for private enterprise (indicator Business Freedom), one can still expect the division between a group of Western and Northern countries on the one hand and a group of Southern and Eastern countries on the other. This supposition is confirmed by the analysis – the first major cluster consists of the Western countries Austria, Belgium, France, Germany, Ireland, the Netherlands, the United Kingdom and Nordic countries Denmark, Finland and Sweden, the second major cluster includes Southern and Eastern countries in the years 2000, 2008 and 2011. A surprising fact could be the unstable position of the United Kingdom and especially France. This instability is caused, in particular, by the third indicator included in this dimension – Political Stability. Big

countries such as France and the United Kingdom (and also Spain) suffer more often with terroristic attacks (Madrid 2004, London 2005), are responsible for military intervention, etc. Moreover, the United Kingdom and Spain are confronted with separatist tendencies in the long-run, France experienced violent social and ethnic disturbances in the previous decade and all these phenomena are reflected in the indicator of Political Stability. On the contrary, as far as the CEE countries are concerned, their main problem within this dimension is related to the low quality of their legal and institutional framework. The only country that was able to converge during the analysed period is Estonia, which became a member of the Western-North cluster in 2008.

Figure 4: Clustering in the dimension of Macroeconomic Policy

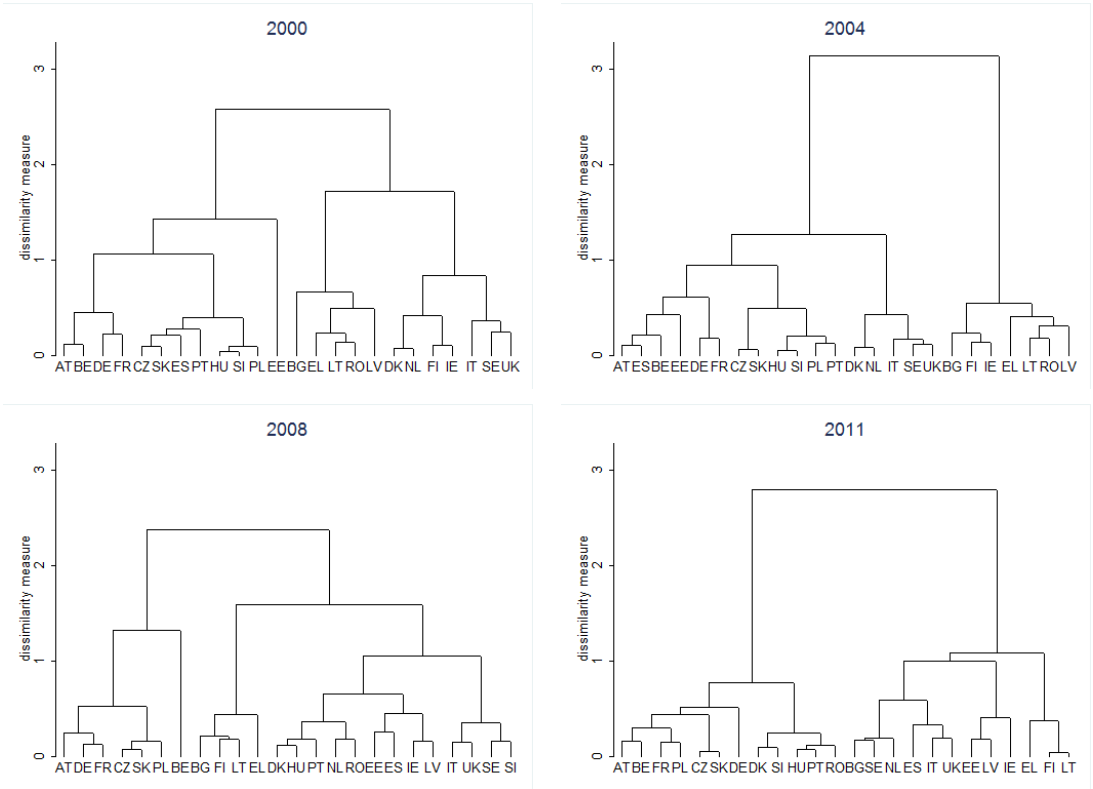


Source: Authors' calculations

A few interesting observations can be made when analysing clusters in the dimension of Macroeconomic Policy. There is a relatively homogenous cluster made of Spain, Portugal, Netherland, Ireland and the United Kingdom over the whole analysed period. These countries have a lower average Implicit Tax Rate on Labour and Government Spending compared to the rest of the EU15. Apart from the UK, their measures of monetary policy do not differ with regards to their membership in the EMU. Common monetary policy seems to have an impact on making the cluster of EMU core countries. The opt-out countries Sweden and Denmark also belong to this common cluster. Only the Netherlands moves out due to a rather different development of fiscal indicators, as mentioned above. Although we classify Italy among periphery countries, due to its worse economic performance, high indebtedness and lower competitiveness, it appears as

a part of the core from the perspective of Macroeconomic Policy dimension. Also the CEECs[26] create a rather homogenous cluster due to their low Government Spending, low Implicit Tax Rate on Labour, and similar development of the Monetary Base measured with M2 aggregate. In addition, the lending interest rates of CEE countries are higher, particularly in the first half of the analysed period, compared to the rest of the EU. Slovenia moved out of the CEEC cluster closer to the core of EMU in the last part of the analysed period, as is clear from the 2011 dendrogram. We attribute this shift to its membership of the EMU. Apart from the common movement in Lending Rates and M2 indicator also the Government Spending in Slovenia increased significantly in 2009 as a reaction to start of the crisis.

Figure 5: Clustering in the dimension of Single Market and Openness



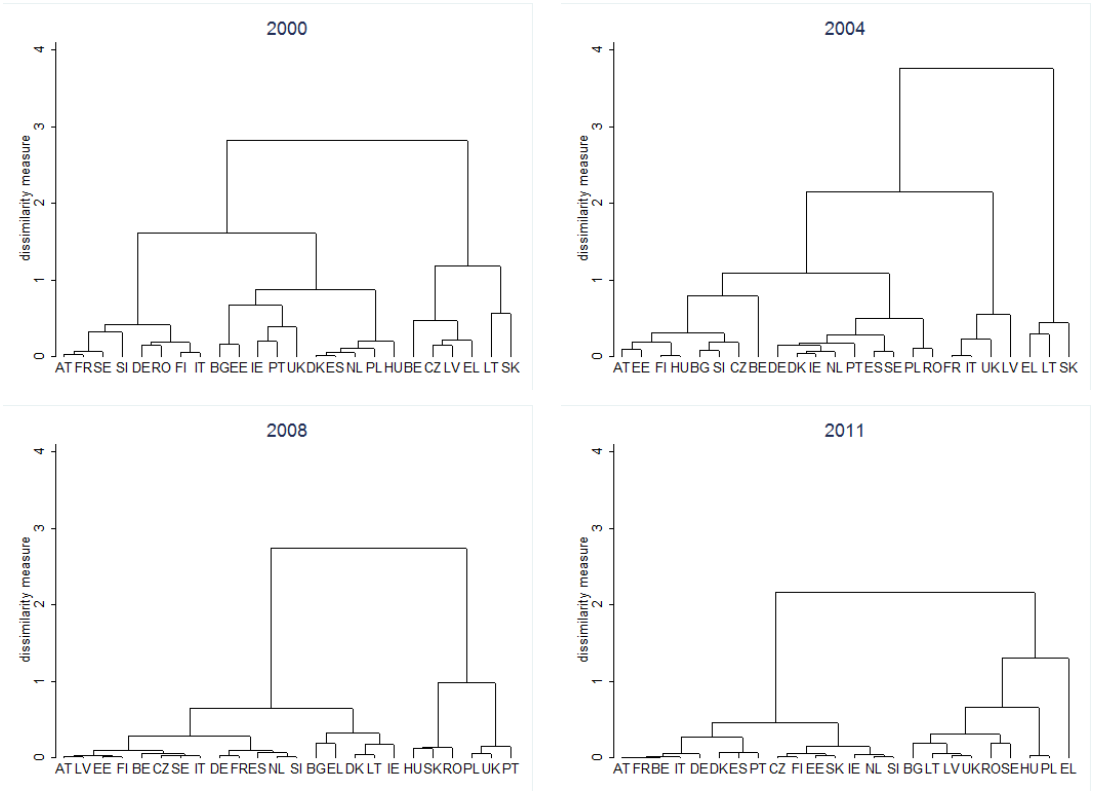
Source: Authors' calculations

Regarding the Openess and Single Market dimension, there are no clear homogenous clusters staying stable over the whole analysed period. However, this does not mean that there are no differences identified among countries related to trade measures. Countries with a relatively low intra-industry trade measured with the Grubel-Llyod Index can be identified in the sample. These are Finland, Ireland and the Netherlands. Also their trade with the rest of EU 27 is relatively low compared to the rest of the sample especially in the second half of the analysed period. Also decreasing distances in individual clusters give evidence of integration related to trade linkages in the EU. CEECs do not create a homogenous cluster. Poland and Slovakia have a relatively higher level of intra-industry trade and also total trade with other EU countries, which shifts them closer to core countries such as Austria and Belgium. Nevertheless, the distance from other

[26] Estonia was excluded from this part of analysis due to low data availability.

CEECs is not too high. The Czech Republic and Slovakia reveal similar Foreign Direct Investment Intensity to Austria, France and Belgium in most of analysed period.

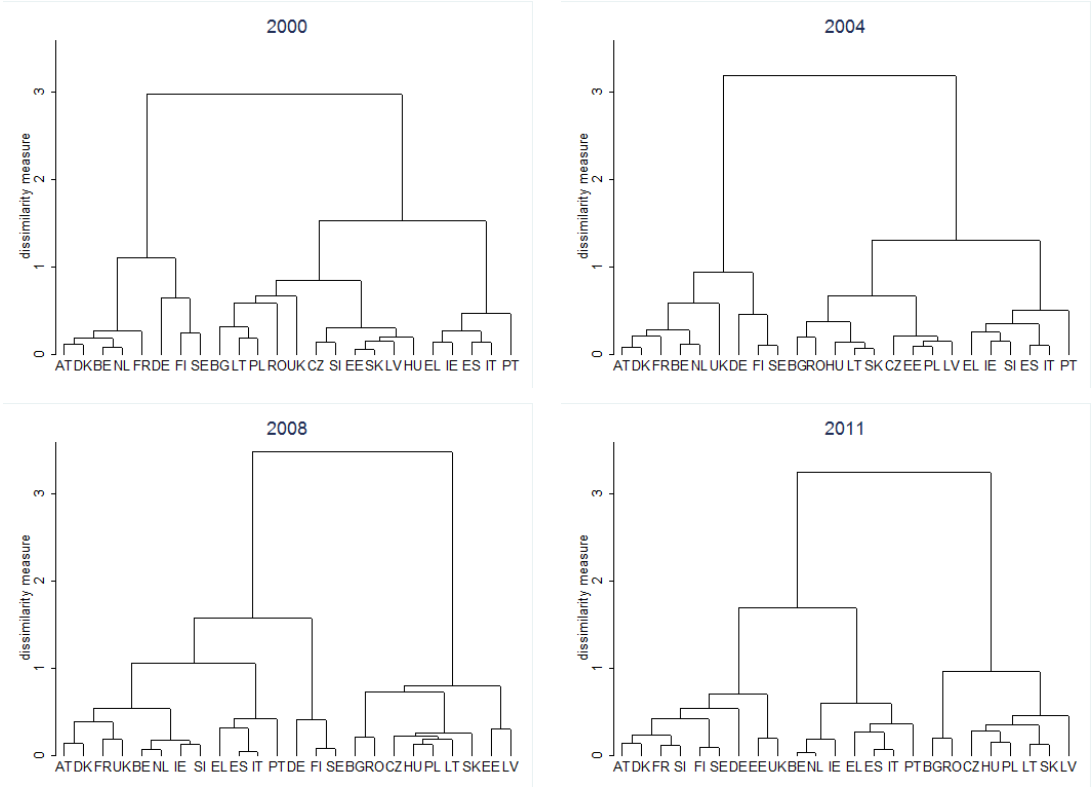
Figure 6: Clustering in the dimension of Symmetry and Convergence



Source: Authors' calculations

Assessing the dimension of Symmetry and Convergence capturing the business cycle similarity measures one might notice a generally low average distance in dendrograms in figure 6. Putting together four measures of Business Cycle Similarity Europe seems to be highly integrating and converging. Examining the detailed results some outliers are obvious in each analysed year, apart from the boom year of 2008. At the beginning of the analysed period in 2000 a cluster of countries standing out of the majority of the EU is identified. These are the CEECs, including the Czech Republic, Slovakia, Lithuania and Latvia. Also Belgium and Greece shift out in that year. In the year of a large EU enlargement, 2004, a cluster of countries consisting of Slovakia, Greece and Lithuania lies out from the rest of EU countries. The gap even increased, compared to situation in 2000. The rest of the EU is characterised with a high level of Business Cycle Similarity. In the break year of 2008, meaning the end of years of growth and the beginning of the crisis for the majority of countries, no outlying clusters can be clearly identified. Differences between all countries are very low. The average distance between countries in clusters goes to zero. To be very detailed, a cluster of CEECs made of Hungary, Slovakia, Romania and Poland is observed in that year. Greece shifted out making a one-country cluster, compared to the rest of the EU in 2011. Particularly, GDP correlation of Greece to the EU average decreased remarkably. Focusing on the CEE countries, a cluster of Bulgaria, Lithuania, Latvia, Romania, Hungary and Poland is delimiting in the sample. Still, the differences between that cluster and the rest of the EU covering the core, periphery and other CEECs are negligible.

Figure 7: Clustering in the dimension of Competitiveness



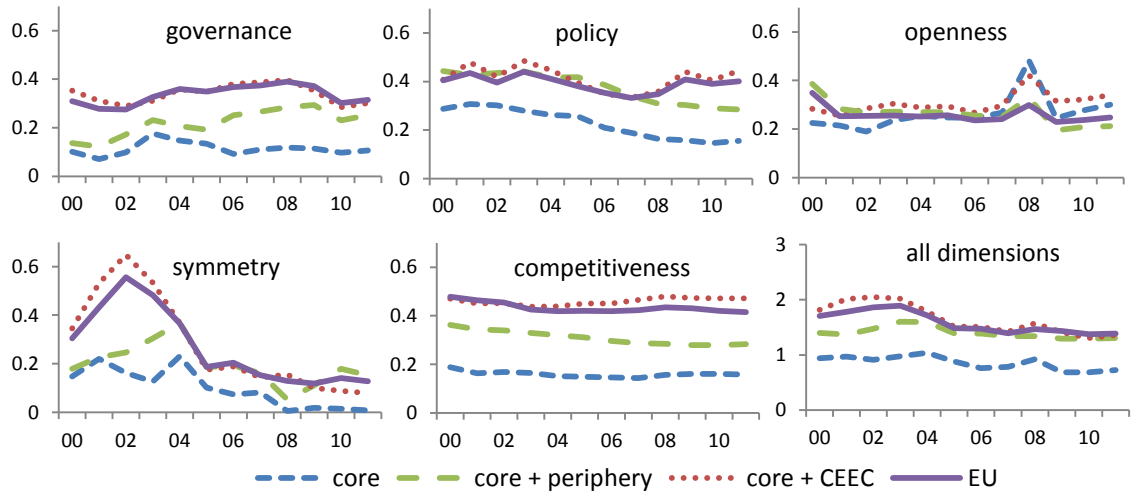
Source: Authors' calculations

Regarding the Competitiveness measures one might expect clearly distinguished clusters of countries with higher competitiveness such as the core countries or countries in the north of Europe, including Sweden and Denmark. On the contrary, the south European countries or the so-called periphery are considered to have lower competitiveness with possible convergence tendencies. We also ask whether the CEECs make a homogenous cluster and how it changes during the integration process. As is clear from figure 7, the structure of clusters based on competitiveness measures is not changing during the analysed period from 2000 to 2011. We can see a homogenous cluster of the core countries completed with the "opt-outs" Sweden, Denmark and the United Kingdom. Italy, Spain, Portugal and Greece making the south periphery create a common cluster over the whole analysed period. Ireland moved from that cluster in 2005 closer to the core countries meaning rising competitiveness and convergence. The CEECs also put together a relatively homogenous cluster with a low internal average distance, which implies similar competitiveness measures' development during the integration process. One should note Slovenia converging faster than the rest of CEECs and joining the core cluster in 2005. Similarly, Estonia shifted out from the CEECs cluster closer to the core of the EU. The general differences between the core, periphery and CEE countries might be summarised as follows: The core countries reveal a high level of GERD, a high Real Productivity of Labour together with a stable or slightly decreasing REER. On the contrary, CEECs spend much less for Research and Development (GERD), productivity is constantly lower reaching half of the average of core. The indicator of REER of CEECs is growing steadily over the analysed period. However, one might be careful when interpreting rising REER since in some countries, such as the Czech Republic, this might imply continuing real and price convergence.

4.2 Dynamic analysis: continuing integration of the EU?

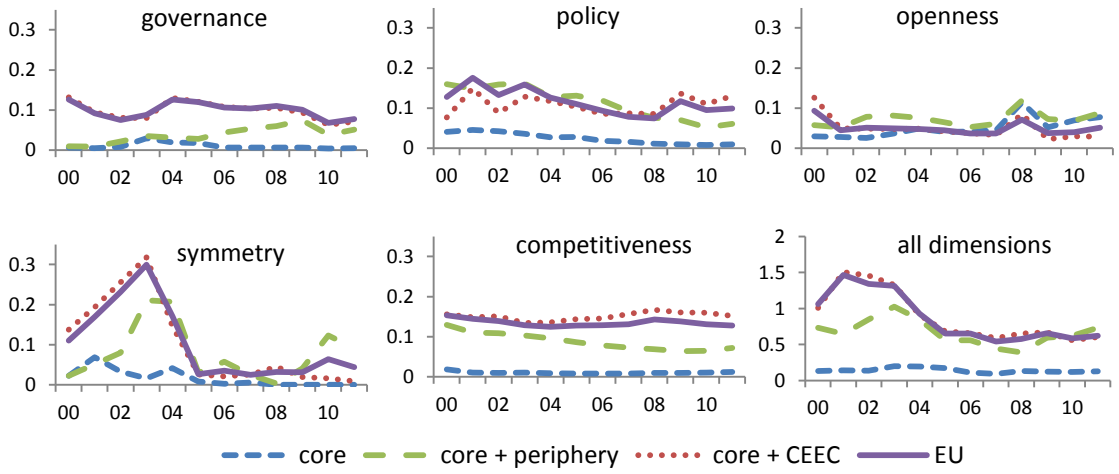
The second part of the cluster analysis focuses on assessing the evolution of the homogeneity level over time. The estimated internal average distance is suggested as the measure of homogeneity. Clusters with a lower average distance reveal less different characteristics in terms of applied indicators and thus are considered as more homogenous country groups. Increasing average distances meaning relatively larger differences in common characteristics imply lower homogeneity and thus increasing heterogeneity in the sample. To examine the contribution of CEECs towards increasing heterogeneity within the EU we set the ex-ante groups capturing the core, periphery, CEE countries and also the whole EU 27. Identifying the core as a cluster with a high homogeneity level in the first part of the cluster analysis using dendrograms, we estimate the impact of the core enlargement with the CEE countries upon a change in homogeneity level. A rising average distance in the enlarged cluster, labelled as core+CEECs, compared to the core cluster implies rising heterogeneity due to enlargement. Then the situation is compared to the cluster made of core and periphery countries and also the whole EU.

Figure 8: Average distances in clusters



Source: authors' calculations

Figure 9: Variance of distances in clusters



Source: authors' calculations

Beginning with the Governance and Institutions dimension, the persisting gap between the core countries and the rest of the EU is apparent. Discussing dynamics in this dimension, first of all, it is necessary to stress that indicators of institutional quality are in principle comparatively stable over time. On the other hand, theoretically, a relatively higher volatility of political instability can be expected. We have already discussed the symptoms of political instability in big countries such as France, Spain or the United Kingdom in the previous section 4.1. Moreover, the periphery countries started to diverge in the second half of the analysed period, which can be explained by the consequences of the financial and economic crisis. Social unrest and even violent demonstrations that have frequently occurred in Southern countries during recent years are also included in the indicator of political instability. On the contrary, the CEE region as a whole was not so intensively impacted on by the financial and economic crisis and this fact could be in the background of gentle convergence tendencies within this area.

The continual distance between the core and the rest of the EU is apparent when assessing the homogeneity level in the Macroeconomic Policy dimension. From 2000 to 2011 the level of internal homogeneity of the cluster made of the core countries increased steadily. Common monetary policy and a similar approach to fiscal stabilization among the core countries are considered the main determinant for the declining trend in the average distance in clusters as shown in figure 8. The average internal distance of the cluster made of the core and periphery countries is higher. However, the declining trend is obvious over time, meaning rising homogeneity. The impact of CEECs[27] and periphery countries upon the homogeneity level of the enlarged EU/EMU core seems to be similar till the beginning of the crisis in 2008. Since then the macroeconomic policy mix of CEECs starts to be different and increases the general heterogeneity level in the EU. This is in line with a decreasing trend in distance variances in the case of the core and its enlargement with periphery. The variance increases in the case of a cluster made of core and CEECs as well as the whole EU since 2007/2008. Looking at the data of the dimension one might notice a significant common decrease in the Official Lending Rates in the Euro area countries since 2007. The rates declined from 5% in 2007 to 1.75% in 2011. On the contrary, the change in Lending Rates was not as apparent in the case of CEECs. The rates in Hungary and Romania even increased or remained the same as in Poland and the gap from the Euro area remained significant till 2011. The impact of a common monetary policy in the Euro area appears to be significant, particularly in the crisis times at which the CEECs did not react similarly. This contributes to rising heterogeneity in the EU after the beginning of the crisis regarding the insider-outsider constellation with respect to the EMU. Analysing the development of M2 and Government Expenditures, no apparent differences between ex-ante country-groups are identified. In the case of Government Expenditures, all EU countries apart from Hungary included in this part of analysis increased government spending (as a % of GDP) in 2008 and 2009. In the rest of the analysed period in 2010 and 2011 almost all EU countries, regardless of being members of core, periphery or CEECs, reduced their annual spending. Focusing on the Implicit Tax Rate on Labour (ITR) development in detail, only a slight change in the case of CEECs is observed. Whereas the average rate in core countries remained unchanged, it decreased by roughly 2 percentage points in the CEECs cluster since 2008.

[27] Bulgaria was excluded from this part of analysis due to deficient data availability.

Low heterogeneity and persisting convergence tendencies are expected in the Single market and openness dimension, consisting of indicators of Trade Intensity, Intra-Industry Trade, FDI Intensity and Labour Migration. The whole EU, including the core, periphery and CEE countries, is very homogenous till the end of 2007. In 2008 a sharp increase in the average distance in core countries is observed. The detailed analysis pointed out that Belgium and partly Austria moved heterogeneously mainly due to a sharp increase in FDI measure. In 2008 the American company Anheuser Busch took over the Belgian Stichting Interbrew for more than 50 billion USD, which was the biggest investment world transaction in that year, amounting to more than 10% of Belgian GDP. The FDI Intensity measure reached 40.9% in 2008 in Belgium compared to the EU average of 3.9% in 2000-2011. In Austria the measure increased mainly due to few substantial acquisitions done by e.g. Bank Austria Creditanstalt or CA Immobilien Anlagen. Since 2009 the influence of periphery countries upon EU heterogeneity increased mainly due to the FDI Intensity and Labour Migration measures. The FDI Intensity declined more in the periphery countries compared to the core. The number of European employees in the percentage of the total increased more in the periphery countries at the end of the analysed period. This might be interpreted carefully since the total employment level decreased in periphery countries more than in the rest of the EU. On the contrary, the CEE countries contribute to reducing heterogeneity when assessed as a joint cluster with the core countries after 2009.

The Symmetry and Convergence dimension captures indicators of Business Cycle Similarity. Regarding the OCA theory, the rolling correlations of GDP, Industrial Production and HICP growth cycles using data from 1996 were used to asses clustering in the EU. The results presented in figures 8 and 9 provide evidence of dynamic integration processes of the past two decades in the EU. The Business Cycle Similarity increased rapidly after the EU enlargement in 2004. Although the gap between the homogeneity level of country group made of core and the group comprising the core and CEE countries is apparent, over the analysed period the average distance is steadily decreasing. Whereas the convergence tendencies of CEECs continue even after the crisis years of 2008 and 2009, the periphery countries diverge from the core remarkably in that period. The influence upon heterogeneity by periphery countries is so strong that the heterogeneity level approximated with the average distance in the cluster of the core with periphery countries is even higher than in the EU as a whole at the end of analysed period. The uneven impact of the crisis upon particular countries is obvious when examining the dimension of business cycle similarity and convergence. Also variance of distances in the cluster made of core and periphery countries exceeds those of all other remaining country groups proposed ex-ante.

The Competitiveness dimension was established to provide some evidence of structural similarities in the EU economy. Similarly to the hypothesis of the enlarging gap between the core and periphery or north and south of Europe, as described in current literature, we aim to assess the position of CEECs in terms of competitiveness indicators. Let’s recall that traditional indicators, including Labour Productivity and REER, also selected knowledge based economy indicators, were used in the cluster analysis. The persisting gap between core and periphery is apparent. The gap between core and CEECs is even bigger. Whereas the slightly reducing level of homogeneity, meaning slow convergence between the core and periphery countries is observed, the gap between core and CEECs seems to be persisting without any remarkable change in trend. Taking into account the data of used indicators and also the results of sensitivity analysis, we should interpret these results carefully. Although the results show continuing

stagnation, the convergence process is obvious when dropping out the REER indicator in the sensitivity analysis, as shown in figure 11. However, the remaining gap is still remarkable. Looking at the data the reason for such a gap is the persisting difference in the majority of competitiveness indicators. The average GERD of the core countries in period 2008-2011 amounts to 2.58% whereas the CEECs reach 1.07% of GDP. Taking into account the averages of the whole analysed period of 2000-2011, the gap is even deeper. Despite continuing convergence in productivity, the difference from the core is still large. The average real labour productivity for the core countries amounts to 125% of the EU compared to 63% of CEECs in 2008-2011. The educational attainment measures reach similar levels of 75% of the population achieving upper secondary or tertiary education in CEECs and core countries in that period.

To complete the dynamic analysis and provide some overall picture we analysed the development of clustering over an analysed period capturing all indicators (18) and dimensions together. The general level of heterogeneity is considerably higher, which is attributed to the much higher number of indicators involved in the analysis[28]. Remarkable reducing gaps in average distances give evidence of continuing integration and convergence of the CEECs towards the core since 2004, evidence of integration in the EU is as shown in figure 8. Contribution of CEECs to heterogeneity in the EU is similar to periphery countries since that year given the larger scale of the chart. Despite slow convergence, the gap between the core and the rest of the EU appears to be rather persistent till the end of analysed period.

4.3 Contribution of CEECs to increasing heterogeneity in the EU and EMU

The third part of the cluster analysis is related to previous analysis of dynamics. The radar graphs (Figure 10) are used to provide some evidence of the changing impact of the CEECs and periphery countries upon the heterogeneity in the EU from the perspective of selected socio-economic dimensions. The country groups capturing the core, periphery, CEE countries and the whole EU27 are used in this part. Apart from examining the changing impact of CEECs and periphery countries upon the EU heterogeneity over time, the radar graphs also provide information of the internal homogeneity within particular clusters. Theoretical absolute homogeneity corresponding to the possible minimum distance in the dimension is illustrated at the edge points of the radar graphs. Therefore the internal homogeneity of the country groups proposed ex-ante for each dimension is evaluated with respect to their position in the radar graphs in particular years.

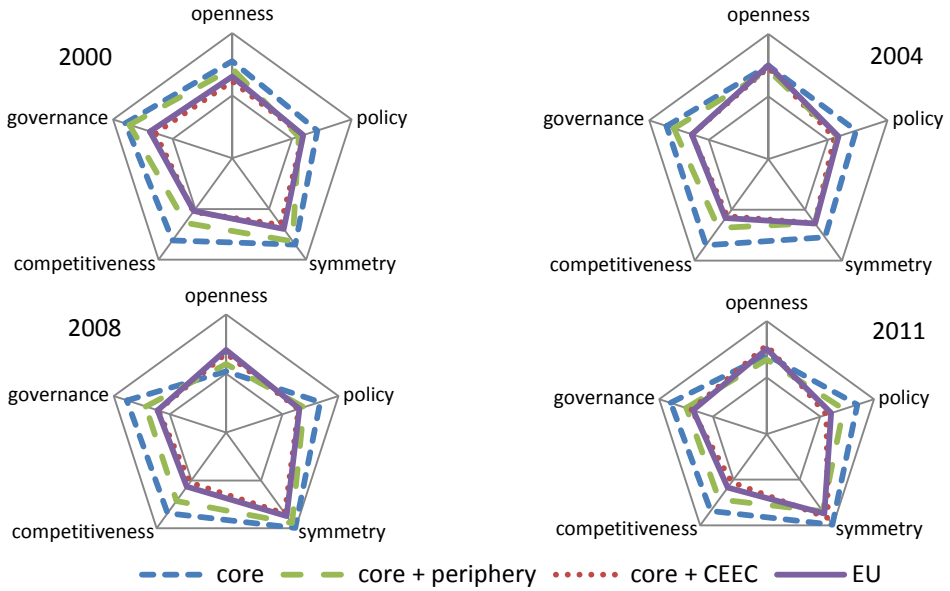
In 2000 the contribution of CEECs to the overall heterogeneity in the EU is relatively high in all dimensions. It is most obvious in the dimensions of Institutions and Governance, Symmetry and Convergence and also Competitiveness. Regarding the Macroeconomic Policy dimension, the contribution of CEECs and the periphery countries to increasing heterogeneity are almost equal. The “old EU” made of core countries and periphery reveal a high level of homogeneity in the Governance and Institutions and also in the area of Symmetry and Convergence. This refers to high political stability and business cycle similarity in those countries at the beginning of the analysed period. Moving to the year of the EU enlargement in 2004, one might observe a

[28] The results are commented on taking into account the larger scale of this summarising dimension compared to the particular ones.

comparable role of CEECs and periphery countries in terms of heterogeneity in the Symmetry and Convergence as well as Macroeconomic Policy dimensions.

Regarding the Openness dimension, the influence of CEECs is negligible since all country groups proposed ex-ante, including the whole EU, reveal similar average distances. Looking at the dendrograms in the first part of the analysis (fig.5) related to that period, no stable clusters corresponding to that ex-ante division (core, periphery or CEECs), are observed. The business cycles of periphery countries became less similar to the core of EU in 2004, which moves them closer to the CEECs. The gaps between the homogeneity level of clusters made of core countries and enlarged with the CEECs tend to be persistent in areas of Macroeconomic Policy, Institutions and Governance, and Competitiveness.

Figure 10: Radar graphs: contribution of clusters to changing level of heterogeneity in the EU



Source: Author´s calculations

The business cycle symmetry increased significantly at the end of the growth period in 2008. The contribution of CEECs to overall heterogeneity is small in this dimension. Moreover, the whole EU is relatively highly homogenous from the business cycle similarity perspective in that year. Similarly to previous years, the contribution of CEECs and periphery is very similar in the field of macroeconomic policy. Fractional convergence of CEECs towards to the core is observed in dimensions of Government and Institutions, and Governance. In 2008 paradoxically the core countries contribute to the heterogeneity of the EU the most of all ex-ante country groups in the Single Market and Openness dimension. It is mainly by one-off increases in foreign direct investment activity in Belgium and Austria, as described above. The influence of that events disappeared in 2011 and the homogeneity levels of all proposed country groups appear to be equal. However, detailed analysis reveals a higher impact on heterogeneity by periphery countries than CEECs. The general level of homogeneity of the whole EU, irrespective of particular clusters, remains high in the area of business cycle similarity. Still, a detailed picture shows a slightly higher contribution to heterogeneity by periphery countries than by the CEECs. Business cycle similarity of the core countries is very high with correlation varying around 0.95.

The uneven impact of the crisis is obvious in the cluster of periphery countries with outlying Greece.

The contribution of CEECs to rising heterogeneity is clear in the Macroeconomic Policy dimension. Despite this, the periphery countries also contribute to rising heterogeneity when putting them together with the core but the impact of CEECs is remarkably higher. As clear from the sensitivity analysis, at which we analyse monetary and fiscal policy dimensions separately, we can attribute this impact to the non-participation of most of the CEECs in the EMU. Correspondingly with the dynamic charts, there is a gap between the core and CEECs and periphery countries. Although the contribution of periphery and CEECs seems to be similar, from the long-term perspective, the CEECs converge. It is mainly due to long-lasting improvement in the area of political stability,

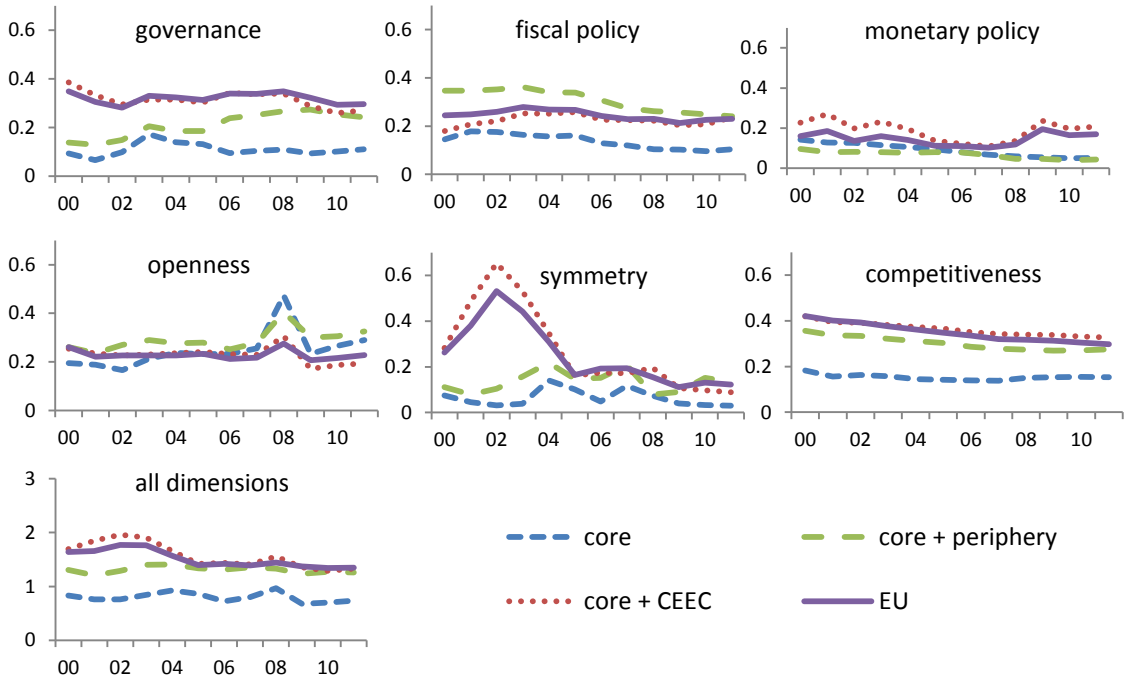
The remaining gap between the homogeneity level of clusters made of core and core with the CEE countries is obvious regarding the Competitiveness dimension. The gap is also observed in the case of periphery countries. Whereas periphery countries reveal slow convergence to the core in terms of productivity and knowledge based economy measures, CEECs stagnate or even diverge. This implies a significant contribution of CEECs to the heterogeneity of the EU from the competitiveness perspective. However, this finding should be interpreted carefully. Analysing the data and examining the sensitivity analysis results. The divergence of the homogeneity level is caused mainly by REER appreciation. This might be an effect of continuing real and price convergence processes in the CEECs. Dropping out the REER measure from the dimension, the CEECs countries converge towards the core and their contribution to EU heterogeneity is decreasing, as shown in figure 11.

5. Sensitivity analysis

The sensitivity analysis is involved in the study to check the robustness of results related to each particular dimension of our research interest. We aim to examine how the results of clustering and its evolution over time are stable when changing the content of dimensions. The indicators are substituted with alternatives regarding their theoretical relevance and multicolinearity restrictions in the dimensions. Some of the indicators where dropped out to reduce the extent of dimensions. The Macroeconomic Policy dimension was split between the fiscal and monetary dimension to detect the influence of common monetary policy and selected fiscal policy measures conducted independently by EU national governments of the EU countries over time. Summarised results[29] of the average distance evolutions in ad–hoc clusters are presented in figure 11. Similarly to the previous chapter the cluster division was designed in order to test the possible influence of enlargement on the EU and EMU with the CEECs compared to the impact of periphery countries.

[29] Resulting dendrograms, radar graphs and charts of variances are not included in the paper due to its limited extent. They are available upon request to the authors.

Figure 11: Sensitivity Analysis: Average distance in clusters in adjusted dimensions



Source: authors' calculations

Beginning with the dimension focused on Governance and Institutions, the Property Rights quality sourced from the Heritage database was substituted with the Rule of Law measure published by the World Bank. The Rule of Law is designed as a broader composite indicator which reflects the perceptions of respondents in having confidence in rules of society including property rights, contract enforcement, police, courts, etc. Therefore the results of the adjusted dimension show practically no change in clusters or trend of average distance measure over time as expected.

The dimension of Macroeconomic Policy was split up between the monetary and fiscal policy dimensions. Regarding the EMU insider-outsider constellation, the level of homogeneity in the Euro area is high for core as well as for core + periphery countries. Moreover, the average distance in the Euro area is decreasing over time steadily. On the contrary, after a period of convergence the CEECs caused increasing heterogeneity in the EU after 2008. The contribution of CEECs to increasing the EU heterogeneity in the dimension of monetary policy is apparent, as clear from figure 11. The fiscal dimension provides a rather different picture. Whereas the core countries become more homogenous overtime, enlargement by CEECs as well as periphery countries increases heterogeneity. Also, assessing the dendrograms the clusters identified in the Monetary Policy dimension are more homogenous and stable over time than in the case of fiscal policy.

Dropping out the Labour Migration measure from the Single Market and Openness dimension, no obvious change compared to the original dimension can be seen. The impact of CEECs and periphery countries upon the heterogeneity in the modified dimension is almost identical as in the original one. Also, the clustering structure in the dendrograms remained almost unchanged.

The Industrial Production was substituted with the Unemployment rate when assessing the checking of the stability of the Similarity and Convergence dimension. As is clear from figure 11, the main trends do not differ so much compared to the dimension without including the

Unemployment rate. Involving the Unemployment rate into the analysis, the impact of periphery countries upon increasing heterogeneity is slightly weaker. In addition to that, the convergence of business cycles in periphery countries towards the core is more intensive. The cycles of CEE countries converge towards the core steadily over the analysed period. Omitting the ex-ante country groups assumptions, the dendrograms of the modified dimension show only a few changes in the clustering structure. In 2008 a group of countries including Hungary, Romania and Slovakia created a homogenous cluster moving out of the rest of the EU. In the final analysed year Greece lies out from the other countries in line with results of the original dimension.

The Competitiveness dimension was reduced with the REER measure focusing only on productivity and knowledge based economy indicators. Comparing the new results with the initial dimension we can see no difference till 2004. Since then the convergence of CEECs towards the core cluster is observable. The contribution of CEECs and periphery countries to increasing heterogeneity in the Competitiveness dimension appears to be comparable at the end of analysed period. The results of dynamic analysis are in line with the identified clusters in the dendrograms. Omitting the measure of REER we can see a generally lower average distance among clusters, as well as individual countries. In the first half of the analysed period the countries of the core were completed by Sweden, the United Kingdom, and Denmark delimits to the rest of the EU. A large homogenous cluster is made of CEECs and periphery countries, meaning no fundamental difference between these two country groups. In the second half of the period some of the CEEC countries move closer to the core. At the end in 2011 we can identify the Czech Republic, Estonia and Slovenia as being involved in a cluster together with the core countries. The difference in terms of the average distance between that, groups of countries from the rest of EU, seems to be persisting despite a slightly reduced gap. Thus, REER is considered to have a significant impact of low convergence of CEECs towards the core countries in the initial competitiveness dimension.

Finishing the sensitivity analysis by putting all modified dimensions together, the results seem to be stable. The level of homogeneity increased since 2004 when considering the cluster of core enlarging with the CEE countries. Since then the homogeneity level of the EU is unchanged no matter whether with or without CEE countries. The core countries make a much more homogenous cluster compared to those of the whole EU or enlarged with periphery or CEE countries.

6. Conclusions

In discussing the heterogeneity level in the European Union, we examined two central research questions: 1. What are the factors distinguishing between successful and less successful CEE countries in terms of the EU enlargement? 2. How was heterogeneity in the EU developed in the last decade? Unlike other papers taking a very general point of view on heterogeneity (e.g. Filipetti and Archibugi, 2011; Vasary, 2012 or Wagner, 2013), we used a multi-dimensional approach in cluster analysis, which enabled us to identify substantial convergence in economics but moreover, no or only very slow convergence in institutions, already in the period before the economic crisis.

Focusing on the first central research question, we identify the level of (non-elite) political stability, quality of institutional framework, maturity and compatibility of informal institutions and initial economic level as the key determinants of the success of the transition and integration process in Central and Eastern Europe. Countries having reached positive features within these categories were predestined to become members of the European Union. Moreover, we emphasize the importance of this clear prospect – accession to the EU – for the success of the transition process. On the other hand, the ex-ante strategies of economic transition themselves and individual economic policies in individual stages of transition were, according to our analysis, not essential for the successfulness of the integration process in a long perspective.

Focusing on the second central research question, we found that the EU countries do not make homogeneous clusters. Neither do the CEE countries make a homogenous cluster in most of the dimensions over the whole period analysed. The most homogeneous "Eastern" cluster still exists in the area of institutions, where in 2008 only Estonia joined the Western countries. The polarization North-West vs. South-East is identifiable particularly in the dimensions of Governance and Institutions and Competitiveness, in other dimensions such as Single Market and Openness or Symmetry and Convergence, the CEE countries have already converged considerably. The heterogeneity increases when enlarging the core of the EU/EMU by the CEECs in almost all dimensions. However, their contribution to EU heterogeneity is comparable to the impact of the periphery countries in most of the dimensions.

With these results we contribute to the examination of the fourth research question of the WWW for Europe project: "How can institutions of modern market economies be changed so as to internalise the current social and ecological externalities and decrease volatility and divergence in Europe?" Moreover, we can imply two broad and general policy relevant conclusions.

First of all, based on our analysis of development in the CEECs during the last two decades, we provide an original parallel towards the periphery countries. At present, the situation of periphery countries is widely considered to be the most significant problem of the EU. In order to create a competitive and sustainable economic model, the periphery countries have to implement essential and vast reforms. Therefore, they are in a rather similar position as the CEE countries were in the 1990. What can we thus learn about reforming the South from the transition of the East? In our view, the periphery countries need to find a direction to head for on the horizon of the next 10-15 years. The policy of budgetary savings is inevitable, nevertheless, they should try to formulate a positive vision as well. Analogically, the successful CEECs undertook painful reforms in the early 1990s, however, these were more accepted by people under the clear prospect of a so-called "return to Europe". Furthermore, without a regard to right- or left-

orientation, governments and also elites in successful CEECs consistently supported the integration process with its related consequences. Similarly in the peripheral countries it is crucial for a potential vision to find a broader political and social consensus. On the other hand, it is not so important whether the way to competitiveness should be based on, e.g., knowledge economy, cheap exports or tourism since, in our opinion, there could be more alternative ways to prosperity. Rather than particular forms of economic policies, the existence of a vision itself and its support across the political spectrum are more important for successful transformation of peripheral countries.

Second of all, based on our cluster analysis, we highlight the contrast among development in particular dimensions. While we can measure a high level of convergence regarding trade and business cycles, we can identify a continuing convergence in the case of institutions and competitiveness. In this context, it is necessary to intensify the discussion as to whether such a heterogeneous development is sustainable, moreover, what the consequences of continuing the current path would be. Unfortunately, in the period of the contemporary crisis, we can observe mostly negative outcomes: because of very high economic interconnections, the crisis quickly spread to almost all EU countries, furthermore, problems in a particular country even of such a size as Cyprus can have a serious negative impact on the whole EU. On the contrary, in the situation of considerably different competitiveness among countries, decentralized institutions and heterogeneous policies, moreover, when monetary policy is unified but not for all countries while fiscal policy is entirely decentralized, it is extremely difficult to find an effective solution to the crisis both in terms of higher competitiveness and elimination of the problem of free riders, whether a real one or only a seeming one. In our opinion, the current hybrid state is not sustainable on a long-term perspective. Hypothetically, there are two relevant directions of the solution: either to partially decrease a level of integration, probably including at least a partial reduction of integration in the monetary area (“Northern” Euro?); or to continue to a more intensive coordination of policies and eventually to a higher centralization of institutions.

To be more specific, another policy relevant conclusion can be based on the results in the Macroeconomic policy dimension. In particular, regarding the fiscal policy area, there is a persisting heterogeneity apparent in the EU. Given that the selection of the criteria is not comprised in the European Fiscal Compact, the results confirm our hypothesis of existing heterogeneity since government spending as well as the tax rate on labour are under national governments’ responsibility. On the other hand, we consider a certain level of heterogeneity in the fiscal area as natural because of the considerably varying living standard and different welfare state models across European countries. Moreover, one can hardly choose the most appropriate welfare state model to fit all with the best impact on both economic performance and on fiscal sustainability under current economic conditions in Europe. Therefore, instead of harmonization, we call for better coordination and joint responsibility in the fiscal area, and more generally in terms of policies and institutions in the European Union.

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Annex

Table 6: Shortcuts and abbreviations

CEEC	Central and Eastern European countries		
EBRD	European Bank for Reconstruction and Development		
EMU	European monetary union		
FDI	Foreign direct investment		
GDP	Gross domestic product		
GNI	Gross national income		
GERD	Total intramural R&D expenditure		
GLI	Grubel Lloyd index		
HICP	Harmonized Indices of Consumer Prices		
ILO	International Labour Organization		
IP	Industrial production		
M2	Money and quasi money		
MIP	Macroeconomic Imbalance Procedure		
OCA	Optimum Currency Areas Theory		
GIIPS	Greece, Italy, Ireland, Portugal, Spain		
PPS	Purchase power standard		
REER	Real Effective Exchange Rate		
TSCG	Treaty on Stability, Coordination and Governance		
ULC	Unit labour costs		
AT	Austria	**IT**	Italy
BE	Belgium	**LT**	Lithuania
BG	Bulgaria	**LV**	Latvia
CZ	Czech Republic	**NL**	Netherlands
DE	Germany	**PL**	Poland
DK	Denmark	**PT**	Portugal
EE	Estonia	**RO**	Romania
EL	Greece	**SE**	Sweden
ES	Spain	**SI**	Slovenia
FI	Finland	**SK**	Slovakia
FR	France	**UK**	United Kingdom
HU	Hungary	**EA**	Euro area
IE	Ireland	**EU**	European Union

Does Foreign Direct Investment Synchronise Business Cycles? Results from a Panel Approach

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Does Foreign Direct Investment Synchronise Business Cycles? Results from a Panel Approach*

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June 2013

Abstract

A considerable degree of business cycle synchronization is key to a successful operating currency union. The European Monetary Union as well as many other countries strives to attract foreign direct investment (FDI) because of its reputation as being highly beneficial for the host economy. But stronger FDI linkages may also have a significant impact on business cycles and co-movement of these cycles between countries and therefore create a potential conflict between policies that promote FDI and the conduct of the common monetary policy. In this paper we empirically analyze the FDI channel in more detail revisiting the main determinants of synchronization. Previous studies were mainly interested in the long-run impact employing cross-sectional variation for identification. Their typical identification strategy, however, neglects the strongly time variant nature in the process of globalization in general and of FDI in specific. We extend the literature on the determinants of business cycle synchronization by estimating the impact of the determinants with true panel data and a suitable panel estimator. Results indicate that the trade channel is not as important as cross-section models suggest but that FDI may have the potential to increase co-movement of business cycles.

JEL Classification: F21, F41, F44, F49
Key Words: Business Cycle Synchronization, FDI, Trade, Sectoral Differences

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1 Introduction

In this paper we identify the main sources of business cycle synchronization across a set of highly economically integrated countries. This research aim has a tradition in the literature that studies conditions on the optimality of currency areas in terms of business cycle synchronization. The policy relevance of this strand of research arises since a considerable degree of business cycle synchronization between member countries is an important prerequisite for a successful operation of monetary policy (because of the one-size-fits-all interest rate). Empirical evidence on the channels through which cyclical co-movement is induced will add to the reinforced policy coordination measures of the EU by giving structural policies that foster synchronization a role for improving the efficiency of the single monetary policy.

We extend the previous literature on the determinants of business cycle synchronization in two dimensions: First, we explore linkages between the main determinants of business cycle synchronization, namely trade integration and differences in the sectoral structure and put special attention to the influence of financial integration through intensified foreign direct investment (FDI) relations. FDI stocks have increased strongly in the past decades, much stronger than trade links, and by now few large multinational firms represent in many countries a big share of economic output and employment (Kleinert, Martin, and Toubal, 2012). They provide therefore a basis for strong international linkages through their cross-border activities such as intra-firm trade, firm-wide investment plans or wage setting. In particular for the European Monetary Union (EMU), foreign direct investments are essential elements for completing the Internal Market and thus promoting economic integration and the overall competitiveness of the region. While economic rational and research suggests that promoting FDI through investment policies are valid instruments to remove barriers to the completion of the Internal Market (Ilzkovitz, Dierx, Kovacs, and Sousa, 2007), theory and available empirical evidence are more unclear about the effects of deeper cross-border capital links within a region on business cycle synchronization. Thus, there could be a potential conflict between European policies that aim to foster FDI linkages and the efficient policy-making by the European Central Bank if member states' cycles tend to move apart because of desynchronizing forces of the FDI channel. Studying the question whether two countries that are strongly linked through capital stocks show a higher co-movement of output cycles than two countries that are less connected through capital cross-links will clarify such concerns.

Our second contribution to the literature is a more technical one, however, as we argue below, a necessary step forward in the empirics of business cycle synchronization by using panel instead of cross-section data to identify contemporaneous bilateral relations among the determinants. Previous research mainly focused on averaging the data over time and running cross-section regressions on country (pair) means of the explanatory variables. In such regressions, business cycle synchronization between two countries is usually measured

by the Pearson correlation coefficient of GDP cycles over the whole sample period. Some studies impose a panel structure by computing correlation coefficients and averages over few non-overlapping sub-periods of equal size (e.g. Schiavo, 2008; Hsu, Wu, and Yau, 2011). These approaches lead to an identification problem if the data are characterized by trends over time since averages become time dependent and the building of arbitrary sub-periods will randomly influence regression results. As we show below, in particular trade and FDI intensity measures display strong time trends. A more systematic way of exploiting the between and within variation of the data is to directly run panel regressions and, moreover, take country-pair and period fixed effects into account. Country-pair fixed effects consider unobserved heterogeneity between two countries that arises, for instance, due to geographical or cultural proximity while period specific effects capture common time shocks in the similarity measures. The latter are relevant to distinguish the transmission of shocks through trade and FDI linkages from common shocks as source of output cycle synchronization (e.g. Kappler, 2011). Thus, panel estimations are much more capable of reconciling theory with empiricism than pure cross-sectional or pseudo panel estimation approaches can do.

Our results show indeed that the contemporaneous effect of trade integration on business cycle synchronization is not as robust as reported by previous studies. Thus, the correlation between trade relations and synchronization may be largely driven by common underlying factors. Furthermore, regarding FDI linkages we find a significant positive in most cases or insignificant coefficient. This implies that policies fostering bilateral FDI integration do not harm synchronization between these countries. In contrast, they may even increase co-movement. Finally, increasing heterogeneity in the sector composition between countries is found to have a negative impact on their cyclical synchronization.

Before introducing our empirical approach in section 3, the next section provides a short overview of the motivation and the results for the main determinants of business cycle synchronization from the literature. Section 4 clarifies data and measurement concepts, estimation results are presented in section 5. The last section concludes.

2 Literature

Despite the considerable degree of cross-boarder activities arising from foreign direct investment, so far theoretical analyses on the effects of financial integration on business cycles focused almost exclusively on the case of portfolio investment and bank integration. The studies by Russ (2007) and Cavallari (2007, 2008, 2010) are an exception. These authors integrate heterogeneous firms in a monetary two country business cycle model, which choose according to their productivity whether to enter a domestic or foreign market and whether to serve foreign markets through trade or through a foreign affiliate. Households participate in firms activity by holding shares of all types of home

based firms. Thus, the activities of multinational firms foster the co-movement of output across countries by increasing the degree of (dividend) income interdependence.
As regards financial integration in a broader sense, Heathcote and Perri (2002) show that in standard two-country two good international real business cycle (IRBC) models the cross-country correlation between output is higher in the case of financial autarky than with the existence of an internationally integrated bond market or complete asset market. In open financial markets firms can reallocated their resources more efficiently, i.e., to the country with higher productivity, if hit by a shock. Thus, increased financial integration lowers the synchronization of output. But if investors are subject to binding collateral constraints, Devereux and Yetman (2010) and Devereux and Sutherland (2011) find that co-movement differs with respect to the type of financial integration. While integration in bond markets continues to result in lower output correlation in their model, integration in equity markets, where constraints are in place, leads to a transmission of technology shocks across countries through the balance sheet of constrained (international) investors causing output fluctuations to co-move. A similar mechanisms is emphasized by IRBC models incorporating multinational banks, which were developed in the aftermath of the financial crisis of 2007 (see Olivero, 2010; Enders, Kollmann, and Müller, 2011; Ueda, 2012). Financial integration in these studies is modeled by financial intermediaries (banks) operating at a global level. In consequence, a negative country-specific shock to the capital of a bank spreads to another country because of binding capital constraints faced by the international bank, which results in co-movement of international output fluctuations. In contrast, country-specific technology shocks do not lead to synchronized business cycles just like in a conventional IRBC model such as Backus, Kehoe, and Kydland (1992).
The empirical literature suggests several additional transmission channels of business cycle shocks through multinational firms which are not incorporated into business cycle theory so far. First, FDI gives rise to increasingly international supply chains enhancing the spill-over of idiosyncratic shocks from one country to another.[1] Furthermore, Stevens and Lipsey (1992) and Desai and Foley (2006) provide evidence that rates of return and investment of affiliates within a multinational firm are highly correlated pointing to cross-border investment plans. Budd, Konings, and Slaughter (2005) and Jansen and Stokman (2006) both come to the same conclusion, though the first study is based on a firm-level panel and the second on macro data, that multinationals share their profits between their affiliates providing a further transmission channel. Balance sheet effects (similar to what Devereux and Yetman (2010) and Devereux and Sutherland (2011) propose) may be another transmission channel since the balance sheet of a multinational may be more susceptible to changes in the financial conditions in one of its host countries due to its international exposure (see Desai, Foley, and Forbes, 2008). But multinational firms may also benefit from their internal capital markets (see Desai, Foley, and Hines, 2004) and therefore perform better than local firms under strong financial constraints as Hovakimian

[1]IRBC models in the spirit of Burstein, Kurz, and Tesar (2008) capture vertical integration by explicitly including trade in intermediate goods. They find this to be an important channel for synchronization.

(2011) and Alfaro and Chen (2012) point out. Finally, when engaging in business abroad multinational firms trigger knowledge and technology transfers which in turn may narrow the gap between GDP growth rates.
To summarize, from a theoretical point of view the direction of the influence of FDI on synchronization is not clear. Most of the possible channels though point to a positive relation between FDI integration and cyclical co-movement. But as Morgan, Rime, and Strahan (2004) point out, the sign of the relation may strongly depend on the type of shock. If the financial sector of a foreign country is hit by a negative shock, a parent company may support its affiliate with financial liquidity. If in contrast there is an adverse shock to productivity, the parent may withdraw its support and shift resources to more profitable locations.

Most empirical studies on the determinants of business cycle synchronization report a positive impact of financial integration on output co-movement irrespective of the measure in use. De-jure measures like composite indices based on the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)[2] are employed as well as de-facto volume-based or price-based measures like bilateral asset holdings and capital flows or return spreads of equity or bond holdings (see e.g. Kose, Prasad, and Terrones, 2003; Imbs, 2004, 2006; Schiavo, 2008; Keil and Sachs, 2012). In contrast to these studies, Kalemli-Ozcan, Papaioannou, and Peydró (2013) use bilateral international bank assets and liabilities and adopt panel methods including country pair and time fixed effects to quarterly data. They detect a strong negative effect of their measure of financial integration on business cycle synchronization and ascribe this opposing result to an omitted variable bias in cross-section analyses, which could not account for global shocks and unobservable country pair specific heterogeneity.
Only few empirical studies investigate the influence of bilateral FDI linkages on co-movement of business cycles. Considering the strong growth and large scale of of foreign direct investment positions but also the various potential transmission channels arising from multinational firms discussed above, this economic linkage is more than just a financial link and a relevant factor to be included. Empirical findings by Otto, Voss, and Willard (2001), Hsu, Wu, and Yau (2011), Jansen and Stokman (2011) and Keil and Sachs (2012) conclude that the positive effects of increased FDI linkages dominate. The latter two note that there is a shift in importance from trade to FDI in the mid nineties. Dées and Zorell (2012) in contrast do not find a significant direct impact of FDI which may be due to their unusual unscaled FDI measure.

In addition to FDI linkages, we include as major endogenous factors explaining business cycle synchronisation trade integration and differences in countries' sector structure. Trade linkages are the most reviewed and robust determinant of business cycle synchro-

[2]See for instance the Chinn-Ito index (Chinn and Ito, 2008) or the restriction indices by Schindler (2009).

nization in the literature.[3] The positive direct effect of stronger trade relations found in the data is in line with theoretical considerations according to which trade directly links foreign and domestic demand and supply. Thus, trade seems to be an obvious channel for transmission of demand and supply shocks. However, IRBC models have notorious difficulties to match the empirical findings quantitatively (see Kose and Yi, 2006). Comparing estimations over subperiods, Böwer and Guillemineau (2006), Jansen and Stokman (2011) and Keil and Sachs (2012) find that the relevance of trade linkages for bilateral synchronization has decreased since the mid nineties. New evidence on the dynamic relationship between synchronization and trade intensity by Kappler (2011) casts doubt on the importance of trade in the transmission of cyclical shocks. His results support the common shock view as they point to common or global factors being the main drivers of synchronization which trigger changes in trade flows contemporaneously. In this study we focus on the contemporaneous effect of time-varying trade intensity while accounting for common shocks through year specific effects.

Similarities in the sectoral structure of two countries may also be of importance for the bilateral co-movement of their business cycles. Countries with a similar industry structure are supposed to exhibit higher co-movement other things being equal since they will respond in similar ways to global and sector-specific shocks. An idiosyncratic shock to a sector in a country will more likely spread to another country if the countries are engaged in related businesses. However, extant empirical evidence on the importance of sectoral similarity is mixed. Differences in the sectoral structure are either found to decrease synchronization of business cycles significantly (for instance Imbs, 2004, 2006 or Inklaar, Jong-A-Pin, and De Haan, 2008) or to have no significant impact at all (see Baxter and Kouparitsas, 2005).

3 Empirical Approach

To identify the determinants of co-movement in cyclical fluctuations, we base our estimations on the first equation of a system of simultaneous equations similar to the equation model first proposed by Imbs (2004), which explicitly allows the endogenous determinants to depend on each other. Therefore, the system includes in addition to the equation explaining bilateral business cycle synchronization one equation for each endogenous determinant and can be written as follows:

$$\rho_{ijt} = \alpha_1 FDI_{ijt} + \alpha_2 T_{ijt} + \alpha_3 SD_{ijt} + \alpha_4 I_{1,ijt} + u_{1,ijt} \quad (1)$$

$$FDI_{ijt} = \beta_1 T_{ijt} + \beta_2 SD_{ijt} + \beta_3 I_{2,ijt} + u_{2,ijt} \quad (2)$$

$$T_{ijt} = \gamma_1 FDI_{ijt} + \gamma_2 SD_{ijt} + \gamma_3 I_{3,ijt} + u_{3,ijt} \quad (3)$$

$$SD_{ijt} = \delta_1 FDI_{ijt} + \delta_2 T_{ijt} + \delta_3 I_{4,ijt} + u_{4,ijt} \quad (4)$$

[3] See Frankel and Rose (1998), Imbs (2004), Baxter and Kouparitsas (2005) to cite the most influential.

where ρ_{ijt} is our measure of business cycle synchronization between country i and country j at time t. The endogenous determinants are given by the bilateral FDI intensity FDI_{ijt}, a measure for trade integration T_{ijt}, and the differences in the sectoral structure within country pairs SD_{ijt}. Furthermore, in each equation m we include a set of exogenous covariates $I_{m,ijt}$. These exogenous covariates serve as instruments in order to identify the impact of the endogenous explanatory variables in equation (1) and in all other equations, where they are not included as exogenous covariates. If all equations are correctly identified, indirect effects of the endogenous determinants on synchronization can be measured in addition to the direct effects. But since there no valid instrument sets for equation (2) to (4) available, we focus on the estimation of equation (1). The disturbances $u_{m,ijt}$ follow a two-way error component model:

$$u_{m,ijt} = \mu_{m,ij} + \lambda_{m,t} + \varepsilon_{m,ijt} \tag{5}$$

where $\mu_{m,ij}$ denotes country pair specific effects, $\lambda_{m,t}$ common year specific effects and $\varepsilon_{m,ijt}$ the remainder stochastic disturbance of equation m. A detailed description of all variables as well as of measurement concepts and of the potential impact of these variables in the system is given in the next section.

In our analysis we proceed as follows. We focus on identifying the direct effects of the determinants of co-movement in business cycles, i.e. we estimate equation (1). First, we test whether we can reproduce the results from literature in a collapsed cross-section sample with observations pooled over time. In the second step, we employ the full panel data set and estimate equation (1) with an error component two-stage least square (EC2SLS) estimator proposed by Baltagi (1981). We test several instrument sets and compute coefficients for different subsets of our data. Finally, we conduct a bunch of sensitivity tests to our results.

A pure cross-section or between identification strategy employing means of time-varying variables is subject to several objections. Identification over the variation in long-term average behaviour between country pairs is based on the assumption of a stable relation between the variables over time. Several studies like Frankel and Rose (1998), Inklaar, Jong-A-Pin, and De Haan (2008) or Keil and Sachs (2012) deal indirectly with the concern of missing stability by splitting their sample into subperiods (which serves in Inklaar, Jong-A-Pin, and De Haan (2008) also to generate more observations). If results for subperiods are considered separately, they point to a change in the importance of trade and FDI over time corroborating this concern. As we show below, measures of trade and FDI integration contain strong trends in their behaviour over time. Thus, an interpretation of their means over the long term is highly questionable. However, applying panel estimation methods allows to capture the within variation in the data. In addition, cross-section estimates may suffer from omitted variable bias, since some variables of interest are not observable and a sound theoretical foundation of the equation is not at hand. Using panel data

enables us to mitigate this problem by taking unobservable country pair specific effects into account which capture time invariant explanatory factors. Furthermore, we introduce year specific effects to control for common shocks to both countries. This is an important aspect in the light of the strong global shocks of the last years and cannot be tackled in a cross-section approach. Cross-section data does not allow to disentangle whether higher co-movement is caused by transmission, e.g. through trade, or by common shocks. In contrast, the impact of a strong global shock may in the cross-section view be interpreted as stronger economic integration, i.e., increased transmission, because the variables of interest contemporaneously move in the same direction.

In the second step, we estimate the equation explaining synchronization with an appropriate panel two stage least squares approach. Nevertheless, we take the whole system into account when instrumenting, since the instruments stem from the exogenous variables included in the remaining equations. Even if we do not estimate these equations "... much can be gained in specifying a system of simultaneous equations as it permits identification of the coefficients of endogenous regressors using as instruments exogenous regressors excluded from the equation of interest.", as Cameron and Trivedi (2005, p.762) state. We employ the EC2SLS estimator expounded in Baltagi (2008), which is a random effect 2SLS estimator based on a weighted average of fixed effects and between 2SLS estimators. It differs from a conventional random effects or generalized 2SLS estimator in taking endogeneity between the explanatory variables into account (not only correlations between country pair fixed effects and explanatory variables). We test its consistency vis-á-vis a consistent but less efficient FE2SLS estimator by applying the Hausman-test principle. As we discuss at the end of section 5, the identification of the indirect effects by estimating equation 2 to 4 is problematic because proper instruments are not available. Therefore, an estimation of the whole system with an EC3SLS estimator, which takes contemporaneous correlations across equations into account and is thus more efficient, would suffer from a bias due to this problem.

4 Measurement Concepts and Data

4.1 Business Cycle Synchronization and its Endogenous Determinants

We measure bilateral synchronization of business cycles ρ_{ijt} as the negative absolute difference between two countries' real GDP growth rate following Giannone and Reichlin (2008), Kappler (2011) and Kalemli-Ozcan, Papaioannou, and Peydró (2013).[4]

$$\rho_{ijt} = -\left|\Delta Y_{it} - \Delta Y_{jt}\right| \tag{6}$$

[4]Detailed information on data sources are listed in appendix A.

This approach has an interpretation similar to the Pearson correlation coefficient—higher levels of ρ_{ijt} indicate a higher degree of bilateral synchronization between country i and j in year t. But it has several advantages over this traditional time-invariant correlation measure of business cycle synchronization. First, it reveals the variation in synchronization over time. Thereby the stationary characteristic of synchronization becomes evident.[5] Second, ρ_{ijt} is independent of the underlying sample period for each t, which is not the case for the mean-based correlation coefficient, even if it is estimated over sub-periods or a rolling window. In addition, this growth rate based measure is not subject to measurement errors and to critiques on filtering methods which applies to estimated measures of business cycles, e.g. by the HP filter, and their correlations.

When measuring bilateral FDI and trade integration, we want to capture the economic importance of these linkages for both countries. Therefore, we apply the following measurement concept

$$T_{ijt} = \frac{EX_{ijt} + IM_{ijt}}{GDP_{it} + GDP_{jt}} \tag{7}$$

$$FDI_{ijt} = \frac{Out_{ijt} + In_{ijt}}{GDP_{it} + GDP_{jt}} \tag{8}$$

where bilateral export and import flows and FDI inward and outward stocks respectively are scaled by the sum over the GDP of both countries.[6] So as long as a shock affects trade or FDI and output proportionally, we observe no change in our intensity measure. We do not account for FDI flows, since they are of minor relevance with respect to their size (relative to GDP). And being mainly the adjustment of existing FDI relations they are just one of the channels through which existing multinationals affect business cycle co-movement.

To capture differences in the sectoral structure between countries we resort to value added shares s_{zit} for the sectors $z = (1, ..., Z)$ of the OECD STAN database covering all economic activities (including services) according to the International Standard Industrial Classification (ISIC) rev. 3 to compute

$$SD_{ijt} = \sum_{z=1}^{Z} |s_{zit} - s_{zjt}| \tag{9}$$

[5] This applies not only to the synchronization measure used in this paper but also to other time-variant synchronization measures proposed in literature, namely by Yetman (2011), Mink, Jacobs, and De Haan (2007), Morgan, Rime, and Strahan (2004) and Alesina, Barro, and Tenreyro (2002).

[6] In some studies total trade flows/FDI positions of both countries are used as scaling factor. The resulting measures have a different interpretation from ours: they capture the importance of a particular bilateral trade/FDI relation relative to overall trade/FDI of these countries. Thus, these measures assign the same importance to large trade flows between very open countries and small trade flows between relatively closed countries with small overall trade. We think that it is the economic value of linkages which matters for synchronization and not their share in countries' overall linkage portfolio.

This measure is equal to zero if countries have an identical sector structure and reaches its maximum of two for complete disjunct sectors. We expect a negative coefficient in our estimation since larger differences in the sector structure between two countries should decrease their degree of synchronization.

Our three endogenous determinants of business cycle synchronization may interact with each other as stated by the equation system above. To be specific, inter-industry trade integration is supposed to rise as result of increasing differences in the sector structure to exploit endowment differences or comparative advantages. Intra-industry trade, in contrast, may be fostered by more similar industries. Higher similarity may in addition stimulate new FDI in order to benefit from technological knowhow abroad, to be closer to the costumer or to reduce transport costs. The impact of FDI linkages on the industry composition is ambiguous. Due to FDI induced technology transfer countries might become more similar with respect to their industry composition, whereas the slicing of the supply chain and the possibility to diversify risks gives rise to a higher degree of specialization. Regarding trade integration effects could point in both directions as well: on the one hand, FDI may substitute trade where trade costs are prohibitively high (horizontal FDI), on the other hand vertical FDI (i.e., off-shoring parts of the production) or export-platform FDI may stimulate trade in intermediate as well as in final goods. Increased trade integration in turn results in deeper specialization according to classical trade theory based on comparative advantages and economies of scale. This argument is valid for inter-industry trade. But as pointed out by Frankel and Rose (1998) and Imbs (2004) among others, trade between industrialized countries and especially between European countries is predominantly of the intra-industry type. As such it could be source for knowledge spill-overs like FDI and therefore augment similarity. Finally, trade is supposed to show a positive impact on FDI since both are driven by common factors such as firm-level productivity (see Helpman, Melitz, and Yeaple, 2004).

4.2 Instruments and Exogenous Variables

Each equation m in the system includes a set of exogenous explanatory variables denoted by $I_{m,ijt}$. These groups of independent variables enter the respective equation directly and are used as instruments for the identification of the coefficients of endogenous regressors in the synchronization equation (and all equations where they are not in the set of explanatory variables).

In the synchronization equation (1) we include in $I_{1,ijt}$ bilateral measures comparing monetary and fiscal policy within country pairs. The discrepancy in monetary policy between countries is captured by absolute differences between short term interest rates. This measure is the higher, the higher the discrepancy between monetary policies, whereas

for country pairs which are both in the EMU it becomes zero[7]. Coordinated monetary policy may increase synchronization by enhancing similar reactions to a common shock or being itself the source of a common shock. In a currency union the stability of the exchange rate may provide an additional indirect positive effect by stimulating trade integration. But in case of idiosyncratic shocks countries under a common monetary policy may lack the possibility of adjustment to keep cycles moving together. Empirical studies find only weak evidence for similarity in monetary policy as enhancing factor (see Baxter and Kouparitsas, 2005). Divergence in fiscal policy is measured as bilateral differences in the government budget balance in percentage of GDP following Darvas, Rose, and Szapary (2007). From a theoretical point of view, the effect of fiscal policies on synchronization is ambiguous depending on the type of economic shock and on the type of fiscal policy. On the one hand, discretionary or rule-based fiscal spending may be used to dampen the effects of country-specific or asymmetric shocks implying a positive impact of fiscal divergence on cyclical co-movement. On the other hand, fiscal policy may also be employed in pro-cyclical way or even be source of a country-specific shock and therefore loosen co-movement. Empirical studies of Darvas, Rose, and Szapary (2007) or Inklaar, Jong-A-Pin, and De Haan (2008) suggest that a higher discrepancy between fiscal deficits has at best a negative effect on the co-movement of business cycles or none as Clark and Van Wincoop (2001) find. Although previous literature (see Inklaar, Jong-A-Pin, and De Haan, 2008) based on cross-section identification shows that there are no major differences in the results between an exogenous and an endogenous treatment of these policy variables, the assumption of no contemporaneous reaction of policy to cyclical fluctuations might be problematic in a panel model. We therefore consider an alternative specification where we include both policy variables with a lag of one year instead of the contemporaneous variables. For the lagged variables the assumption of exogeneity is justifiable from a theoretical point of view. Furthermore, it is known that business cycles usually react with a lag to changes in fiscal and monetary policy. Qualitatively there is virtually no difference in the results between including the contemporaneous and the lagged values of the policy variables. While a noteworthy change in the size of coefficients is only observed for FDI integration which result to be about 25% higher in some specifications when lagged policy measures are used.

Previous papers use as instruments for the endogenous regressors (and as covariates for the remaining equations) mainly time-invariant country pair specific variables like the well-know gravity variables for trade or the indicators on the degree of de jure financial openness by La Porta, Siliances, Schleifer, and Vishny (1998) for financial integration. In our panel estimation approach all time-invariant explanatory factors are absorbed by

[7]Differences in the short term interest rates may be seen as lower bound of overall differences in monetary policy. The extraordinary country specific measures used by the ECB in the last years show that there may be additional differences even within a currency union, at least during times of crisis. In consequence, the coefficient of monetary policy has to be interpreted as an upper bound.

country pair fixed effects. Therefore, by our research design only time-variant variables are considered as instruments and covariates respectively.

Theoretically, an optimal candidate for $I_{2,ijt}$ as an instrument and exogenous explanatory variable for FDI integration would be a de jure measure of openness to FDI. The OECD provides an index on FDI Regulatory Restrictiveness, but unfortunately only for few years.[8] But even more comprehensive data on the legal situation like the indices by Schindler (2009) on direct investment restrictions or the more general Chinn-Ito index (Chinn and Ito, 2008) measuring the degree of capital account openness are problematic for panel data analyses since their within variation is low for most countries. Regressions including one of these variables—transformed into a bilateral measure by taking sums or differences—in $I_{2,ijt}$ return an insignificant effect in the first stage no matter in which estimation specification, while the coefficients of the second stage do not change. Therefore, we do not include any de jure measure of capital or FDI openness in $I_{2,ijt}$. Instead we use indicators for de facto capital controls to explain the degree of bilateral FDI linkages. A better general access to capital in each single country may be an important criterion for direct investment decisions and therefore be favourable to FDI integration. Since the following measures are not based on true bilateral data but are computed by taking differences or sums of indicators for overall capital openness of each of the two countries, their endogeneity may be less of an issue. We include the bilateral sum of the gross private capital flow ratio to GDP as a volume-based measure of capital openness. As alternative, we use a price-based measure, namely the return spread between share price indices which are constructed to represent share price movements in national stock markets. According to theory, in perfectly integrated capital markets the law of one price should hold implying equal returns on comparable assets (Keil and Sachs, 2012). Smaller return spreads indicating a higher degree of financial market integration are therefore expected to foster FDI integration. Additionally, we include lagged FDI integration as suggested by Schiavo (2008) and a measure of overall economic development of a country pair given by the bilateral sum of GDP per capita.

In explaining trade integration with panel data we can build on an established literature. We follow Egger (2000) in including the following index measuring the similarity in the economic size of countries in $I_{3,ijt}$:

$$GDPsimilar_{ijt} = 1 - \left(\frac{GDP_{it}}{GDP_{it} + GDP_{jt}}\right)^2 - \left(\frac{GDP_{jt}}{GDP_{it} + GDP_{jt}}\right)^2 \tag{10}$$

This index is the larger, the more similar two countries are in terms of GDP. Very similar countries are supposed to have a high degree of intra-industry trade and therefore also of general trade linkages. Furthermore, $I_{3,ijt}$ contains the same measure of overall economic development like $I_{2,ijt}$. Additionally, we include an index on the degree of bilateral (de

[8] The index is provided for the years 1997, 2003, 2006 and on an annual basis since 2010.

jure) economic integration which is taken from the Database on Economic Integration Agreements by Baier and Bergstrand (2007), but which is only available until 2005.

Differences in the sector structure are explained by overall economic development (like trade and FDI linkages) and by differences in economic development/wealth between countries measured by the absolute difference in GDP per capita. These two measures both draw on the idea that economies manifest certain patterns regarding the industrial composition in different states of development (Imbs and Wacziarg, 2003). This argument may be less appropriate the more similar countries are with respect to their sectoral structure and stage of development.

4.3 Data Overview

Since the emphasis of our identification approach lies on the within variation in the data, we choose the longest possible sample at the expense of a reduction of the number of country pairs. After the exclusion of South Korea because of its strongly differing synchronization patterns, there are 16 countries left yielding 120 country pairs.[9] Due to the limitations in time range given by OECD's bilateral FDI data and OECD STAN database used to calculate sectoral differences, we obtain a usable data set for the period from 1982 to 2009 at an annual frequency. Descriptive statistics for all variables are included in the appendix A in table 7.

In figure 1 we plot cross-section averages for each point in time of our synchronization measure and the three endogenous determinants. The plots reveal that all variables but synchronization exhibit significant changes in levels over time casting the meaningfulness of long-term averages into doubt.

5 Results

In this section we first report estimation results for the cross-section and then for the panel dimension. We start with a parsimonious specification where we include one (time-variant) instrument for each endogenous variable. These instruments are the volume-based measure of capital openness, economic similarity and overall economic development. We discuss and test the choice of instruments by employing the other available instruments discussed before in our panel estimations.

[9]These countries are: Austria, Canada, Denmark, Finland, France, Germany, Greece, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, UK, US.

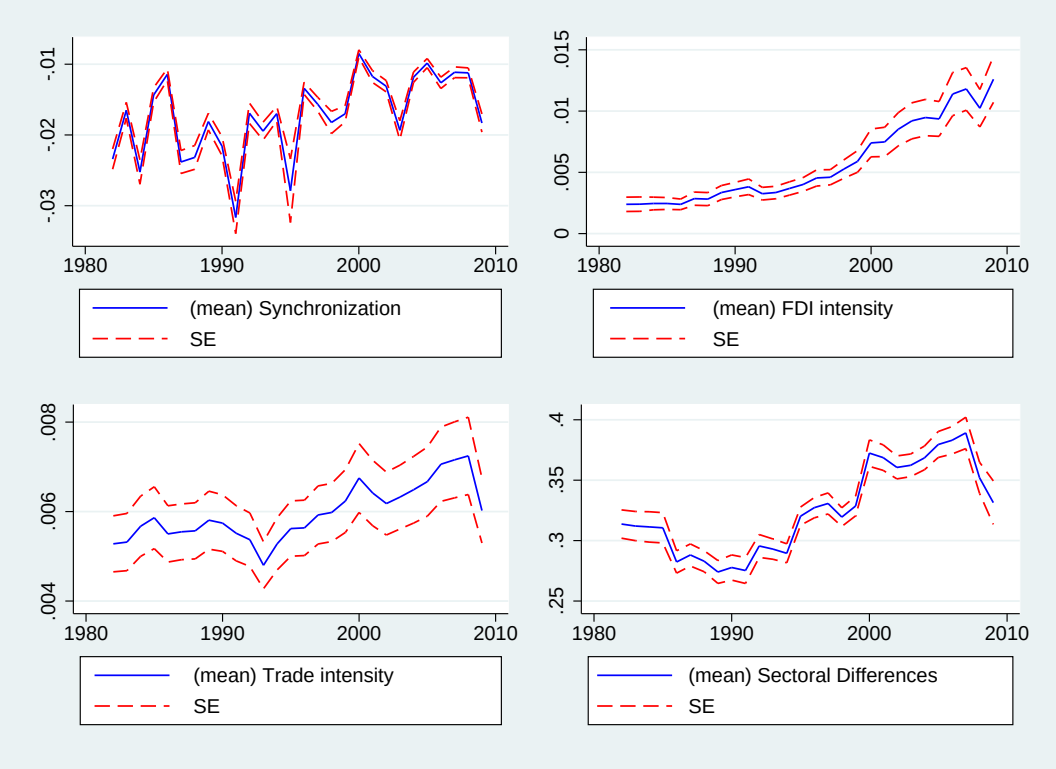

Figure 1: Cross-sectional means of business cycle synchronization and its endogenous determinants

5.1 Cross-section

Before conducting panel estimates we confront our data basis with the cross-section based literature. We do this by estimating the synchronization equation with cross-section data obtained by averaging the data over time. To make the comparison more appropriate, we additionally include a set of time-invariant exogenous variables. Our identification approach based on time-variant instruments presented in section 4.2 cannot correctly identify effects in the cross-section where fixed effects cannot be taken into account. In such a setting, we obtain low F-statistics for FDI and trade integration in the first stage pointing to weak instruments. Including some time-invariant variables serves to at least partially control for country pair specific characteristics. We use standard gravity variables, namely the distance between the main economic centers and dummy variables for common border from CEPII's Gravity dataset[10], as well as the bilateral sum of an index measuring share holder rights provided by La Porta, Siliances, Schleifer, and Vishny (1998). These additional variables remedy the weak instruments problem in the cross-section raising the F-statistics of first step estimations well above the rule of thumb value of 10. In addition, Hansen's J test does not report problems with the validity of the instruments. Estimations are carried out based on pooled data over the whole period

[10]http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=8

from 1982 to 2009 as well as over the subperiods 1982-1994 and 1995-2009. The choice of subperiods follows Jansen and Stokman (2011) who justify their decision by the strong expansion of FDI activity since 1995.

In table 1 the estimates for these three samples are reported. We find that coefficients—especially those of trade and FDI intensity—vary strongly with the underlying sample period. In specific, cross-section estimates can reproduce the positive significant effect of trade linkages on the co-movement of business cycles found in previous studies as long as data from the 1980ies and early 1990ies is included in the sample. Otherwise the coefficient is insignificant or even negative significant. In a similar fashion, we observe a positive significant impact of FDI integration only for the last 15 years of our sample. The shift in the coefficients over time has not necessarily to be a signal for a change in

Table 1: 2SLS cross-section basic specification (including time-invariant instruments)

Dependent Variable	Synchronization	Synchronization	Synchronization
Period	1982-2009	1982-1994	1995-2009
FDI	0.118	-1.583	0.594
	(0.164)	(0.654)**	(0.227)***
Trade	0.058	0.727	-0.703
	(0.208)	(0.223)***	(0.342)**
Sectoral Differences	-0.000	-0.035	-0.034
	(0.016)	(0.010)***	(0.017)*
Monetary Policy	-0.120	-0.043	-0.245
	(0.037)***	(0.033)	(0.070)***
Fiscal Policy	-0.029	-0.027	0.061
	(0.034)	(0.029)	(0.032)*
N	120	59	120
Hansen's J Test			
χ^2 (d.f.)	7.47 (3)	.79 (3)	.37 (3)
p-value	.058	.853	.946

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

the strength of the underlying relation between FDI or trade linkages and synchronization but may simply be driven by the calculation of means over time series containing trends.

5.2 Panel approach

In this section we discuss the results of estimating equation (1) employing the error component two stage least squares (EC2SLS) estimator on panel data. All panel estimations include country-pair specific effects and a full set of year dummies if not stated differently.

Table 2: EC2SLS basic specification with parsimonious instrument set for subperiods

Dependent Variable	Synchronization	Synchronization	Synchronization
Period	1982-2009	1982-1994	1995-2009
FDI	0.249	0.175	0.176
	(0.124)**	(0.969)	(0.116)
Trade	-0.157	-0.118	-0.005
	(0.198)	(0.483)	(0.198)
Sectoral Differences	-0.039	-0.037	-0.034
	(0.009)***	(0.015)**	(0.009)***
Monetary Policy	-0.097	-0.038	-0.117
	(0.024)***	(0.044)	(0.028)***
Fiscal Policy	0.064	0.043	0.051
	(0.012)***	(0.028)	(0.015)***
Year Dummies	Yes	Yes	Yes
N	1,793	331	1,462
Hausman Test FE2SLS vs. EC2SLS			
χ^2 (d.f.)	4.53 (32)	.35 (6)	9.03 (7)
p-value	1	.999	.25
Hansen's J Test			
χ^2 (d.f.)	19.98 (25)	15.885 (12)	20.08 (17)
p-value	.748	0.197	.27

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Basic Specification with Parsimonious Instrument Set The results of our basic specification with the same parsimonious (time-variant) instrument set and over the same subperiods as in the cross-section approach are reported in table 2. In contrast to the cross-section, estimates for the recent period from 1995-2009 are not very different from the overall sample, whereas there are some changes in significance for the earlier period. However, these results should not be over-interpreted since estimations on the earlier sample may suffer from the relatively low number of observations. FDI has a significant positive effect on synchronization over the entire period but remains insignificant for the subperiods. We additionally estimate the equation excluding the crises driven years since 2007. The results of this estimation are not reported since the only remarkable change is a higher impact of FDI (0.397) on synchronization at a 1% significance level. Regarding trade we do not find a significant impact for any subsample. As we will show in the following the coefficient of trade integration is insignificant not only in our basic specification but also in our sensitivity tests. Differences in the sectoral structure in turn have a negative significant effect on cyclical co-movement implying that the transmission of idiosyncratic shocks between countries is the weaker the bigger the differences in their sectoral structure. Therefore, it may well be possible that FDI and trade exert an indirect influence on business cycle synchronization by causing changes in the sectoral composition of economies.

The differences in monetary policy are estimated to have a negative impact on the cyclical co-movement of a country pair implying higher synchronization in countries with similar short term interest rates. In contrast, differences in the net lending position of governments have a positive effect. This result may arise from the fact that governments make deficits when trying to buffer their country from idiosyncratic shocks.

The last part of table 2 reports Hausman tests based on the difference between fixed effects two stage least squares (FE2SLS) and EC2SLS estimates.[11] The null hypothesis of consistent EC2SLS estimations cannot be rejected for any of the three samples. Furthermore we checked the F-statistics of the EC2SLS and FE2SLS first stage regressions, which signal no problems of weak instrumentation for any of the endogenous covariates being all two-digit. We find F-statistics from FE2SLS to be higher than the single-digit F-statistics of first stage between regressions emphasizing that country pair specific effects should not be neglected. In addition, we test the exogeneity of instruments by means of Hansen's J test, i.e., testing the validity of overidentifying restrictions. In contrast to the Sargan test this test is consistent in the presence of heteroscedasticity. With our parsimonious instrument set containing just one instrument for each endogenous variable, such a test is only possible for random effect estimators. When applying the EC2SLS estimator the exogenous regressors (in our case the indicators for monetary and fiscal policy as well as all year dummies) are subject to a GLS transformation before the estimation. In the IV estimation (on the transformed data) the transformed regressors are all treated as

[11] In appendix B the FE2SLS estimation results are reported in table 8.

endogenous while for each of them their demeaned and recentered transformation as well as their group mean transformation are used as excluded instruments. In contrast, for the FE2SLS the test is not applicable since the equation is just identified. The results of Hansen's J test on the EC2SLS estimations confirm our parsimonious instrumentation.

Alternative Instrumentation In order to test the dependence of our results on the instrumentation, we add the alternative instruments named in section 4.2 one-by-one to the parsimonious instrument set. In table 3 we report the estimation results as well as the test statistics of Hansen's J Test. The first column repeats the results of the parsimonious instrument set, the following columns add in turn the measures of differences in economic development, differences in return spreads and the indicator on Economic Integration Agreements (EIA) and finally lagged FDI intensity to the instrument set.[12] The changes in the instrumentation do not come with significant changes in the results reported for the parsimonious specification except for the FDI coefficient when including EIA or lagged values of FDI. In the first case the impact of FDI is bigger, which is due to the data limitations of the EIA indicator. As mentioned before, it stops in 2005 so that the crisis years are excluded from the sample. Including lagged FDI integration as an instrument yields an insignificant effect of FDI integration on business cycle synchronization. We repeat this exercise with our second subperiod from 1995 to 2009[13] and find a very similar picture: The coefficient of FDI linkages is significant in all but the parsimonious specification and the one including lagged FDI.

Relation of FDI and Trade A potential reason for the insignificant effects of trade integration could be its multicollinearity with FDI. Indeed, in the cross-section we observe an unconditional correlation as high as 0.71 between the two variables, which makes cross-section based estimations including trade and FDI even more questionable. In the panel data the unconditional correlation still amounts to 0.65, but drops to 0.44 if we take country-pair fixed effects into account and to 0.37 if additionally year specific effects are included. Considering the correlation between country pairs and within country pairs separately, it emerges that the high correlation is mainly driven by strong relations between trade and FDI across country pairs, but not over time. The correlation between country pairs amounts to 0.69 averaged over all years, whereas the correlation over time adds just up to 0.31 averaged over all country pairs (a detailed statistic on between and within correlation is included in appendix B, figure 2 and 3). This said, multicollinearity seems to be more of an issue if we look at shorter samples or at the cross-section.

As a further test of the importance of multicollinearity for our estimation results, we compute estimations excluding in turn trade and FDI. In the first case, we obtain a some-

[12] In addition, we tried various combinations of bigger instrument sets, but in most of the cases Hansen's J test rejected these bigger instrument sets.

[13] Results are reported in appendix B, table 9.

Table 3: EC2SLS with additional instruments

	(1)	(2)	(3)	(4)	(5)
Instrumentation	Pars.	Ec. Diff.	Return Spread	EIA	L.FDI
FDI	0.249	0.269	0.285	0.489	-0.011
	(0.124)**	(0.134)**	(0.123)**	(0.168)***	(0.059)
Trade	-0.157	-0.172	-0.194	-0.204	0.069
	(0.198)	(0.218)	(0.192)	(0.226)	(0.160)
Sectoral Differences	-0.039	-0.037	-0.038	-0.032	-0.040
	(0.009)***	(0.009)***	(0.008)***	(0.009)***	(0.009)***
Monetary Policy	-0.097	-0.095	-0.096	-0.093	-0.083
	(0.024)***	(0.024)***	(0.024)***	(0.026)***	(0.024)***
Fiscal Policy	0.064	0.063	0.064	0.059	0.054
	(0.012)***	(0.012)***	(0.012)***	(0.015)***	(0.012)***
Year Dummies	Yes	Yes	Yes	Yes	Yes
Period	1982-2009	1982-2009	1982-2009	1982-2005	1983-2009
N	1,793	1,793	1,791	1,447	1,750
Hansen's J Test					
χ^2 (d.f.)	19.98 (25)	17.39 (27)	29.59 (27)	26.21 (21)	21.26 (28)
p-value	.748	.921	0.333	.198	.814

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Excluding trade/FDI

Period	1982-2009	1995-2009	1982-2009	1995-2009
FDI	0.186	0.180		
	(0.088)**	(0.068)***		
Trade			0.160	0.296
			(0.128)	(0.081)***
Sectoral Differences	-0.037	-0.033	-0.035	-0.030
	(0.009)***	(0.009)***	(0.009)***	(0.007)***
Monetary Policy	-0.089	-0.116	-0.058	-0.077
	(0.023)***	(0.026)***	(0.023)**	(0.023)***
Fiscal Policy	0.063	0.050	0.055	0.050
	(0.012)***	(0.015)***	(0.012)***	(0.014)***
Year Dummies	Yes	Yes	Yes	Yes
N	1,793	1,462	1,802	1,471
Hansen's J Test				
χ^2 (d.f.)	18.65 (24)	15.92 (16)	24.5 (24)	40.365 (16)
p-value	.77	.459	.433	0.001

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

what smaller but significant coefficient for FDI linkages in the synchronization equation, for 1995-2009 even at the 1% level, leaving the remaining results qualitatively unchanged (see table 4). Excluding FDI instead leads to bigger changes: the trade coefficient becomes positive, but it is only significant in the subperiod from 1995 to 2009, where the parsimonious instrument set is rejected, though. These results imply that trade effects are not completely irrelevant for the synchronization of business cycles. But the impact of trade may be more of the indirect type, i.e., by fostering stronger FDI linkages and influencing the degree of sectoral differences between economies. Taking FDI out of the system eliminates the first of these indirect channels and results in a weak direct relation.

Synchronization in the EU and EMU We also investigate whether our conclusions from the OECD countries sample hold for the European environment. Therefore, we re-estimate the equation for two smaller country samples, the first limited to country pairs in the European Union and the second including only relations between Euro-area members. Since before 1988 for some of the variables there is no bilateral inner European data available, we report the results for these shorter time frame for all country groups. Estimated coefficients are presented in table 5. They imply very similar results for synchronization in the EU and the OECD. In the Euro area, the impact of FDI remains insignificant, i.e., inner European FDI linkages seem not to affect business cycle synchronization between member countries neither in a positive nor in a negative way.

Table 5: EC2SLS basic specification for EU and EMU

Period		1988-2009	
Country Group	OECD	EU	EMU
FDI	0.249	0.249	0.183
	(0.115)**	(0.124)**	(0.182)
Trade	-0.137	-0.157	-0.169
	(0.183)	(0.198)	(0.267)
Sectoral Differences	-0.040	-0.039	-0.050
	(0.008)***	(0.009)***	(0.022)**
Monetary Policy	-0.101	-0.097	-0.172
	(0.024)***	(0.024)***	(0.036)***
Fiscal Policy	0.063	0.064	0.089
	(0.012)***	(0.012)***	(0.022)***
Year Dummies	Yes	Yes	Yes
N	1,763	1,014	574
Hansen's J Test			
χ^2 (d.f.)	21.14 (23)	14.52 (19)	9.30 (15)
p-value	0.573	.753	.861

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.3 Sensitivity

To test the sensitivity of our results, we estimate several variations of our basic specification.

Alternative Measures of FDI and Trade Linkages In a first step, we use alternative measures for FDI and trade intensity which take the asymmetry between countries into account. In case a country pair consists in countries which differ strongly with respect to their economic size, our trade and FDI integration measures may understate the importance of linkages for the small country. Therefore, we repeat our estimations employing a measure where bilateral trade and FDI linkages are scaled by the GDP of the smaller country as proposed by Otto, Voss, and Willard (2001).

$$\begin{aligned} Ta_{ijt} &= \max\left(\frac{EX_{ijt}+IM_{ijt}}{GDP_{it}}, \frac{EX_{ijt}+IM_{ijt}}{GDP_{jt}}\right) \\ FDIa_{ijt} &= \max\left(\frac{Out_{ijt}+In_{ijt}}{GDP_{it}}, \frac{Out_{ijt}+In_{ijt}}{GDP_{jt}}\right) \end{aligned}$$

Since the results are very similar to those displayed in table 2, we do not include them here for the sake of saving space.

Alternative Measures of Synchronization Furthermore, we conduct estimations with alternative synchronization measures. On the one hand, we use our synchronization measure based on the business cycle computed as HP-filtered output instead of year-on-year growth rates of output. On the other hand, we adopt a measure proposed by Morgan, Rime, and Strahan (2004), which is computed in two steps: first, we recover the residuals from of a regression of real GDP growth on country-pair and year specific fixed effects.

$$\Delta Y_{it} = \mu_i + \lambda_t + \varepsilon_{it}$$

Simply speaking, this residual GDP growth captures for a given year a country's deviation from its own long-run GDP growth and from the cross-section average growth rate in that specific year. The alternative synchronization measure is then constructed in a similar fashion as the basic measure by taking the negative absolute difference between residual GDP growth, i.e.,

$$\rho_{ijt}^{alt.} = -|\varepsilon_{it} - \varepsilon_{jt}|$$

In contrast to our basic measure, this proxy is corrected for changes in the amplitude of fluctuations. In table 6 we compare the estimated coefficients for these different measurement concepts. We find that for the latter measure qualitative results are altered

only for FDI which is insignificant in the parsimonious specification but significant for several other instrumentations (not shown). Whereas when the HP-filtered measure is used, in addition to FDI, monetary policy looses its significance. Furthermore, the instrumentation seems problematic when the dependent variable is based on HP-filtered GDP. There is no sign of weak instruments, but Hansen's J Test rejects the exogeneity of our parsimonious instrument set as well as of alternative instrumentation.

Table 6: EC2SLS with alternative synchronization measures

Based on	Synchronization GDP Growth	Synchronization HP-filtered GDP	Synchronization residual GDP growth
FDI	0.249	0.139	0.194
	(0.124)**	(0.113)	(0.136)
Trade	-0.157	0.198	-0.012
	(0.198)	(0.179)	(0.218)
Sectoral Differences	-0.039	-0.049	-0.032
	(0.009)***	(0.008)***	(0.009)***
Monetary Policy	-0.097	0.017	-0.147
	(0.024)***	(0.022)	(0.025)***
Fiscal Policy	0.064	0.042	0.056
	(0.012)***	(0.011)***	(0.013)***
Year Dummies	Yes	Yes	Yes
N	1,793	1,793	1,793
Hausman Test FE2SLS vs. EC2SLS			
χ^2 (d.f.)	4.53 (32)	15.41 (32)	6.74 (32)
p-value	1	.994	1
Hansen's J Test			
χ^2 (d.f.)	19.98 (25)	73.88 (25)	32.15 (25)
p-value	.748	0	.154

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Alternative Error Structure In our basic specification, contemporaneous correlation of the errors across panel individuals arising e.g. by common shocks hitting the country-pairs are modelled by common time effects in the error term. To check the robustness of the reported results with respect to this choice, we follow an alternative approach proposed by Pesaran (2006) and include cross-sectional averages of the endogenous variables instead of year dummies in the estimation equations. The cross-sectional averages provide a solution to soak up cross-sectional correlation. The idea of this approach is to model the residuals of the panel equation as being composed of two orthogonal components. The first component comprises common factors that soak up the cross-sectional co-movement in the data whereas the second component captures mainly idiosyncratic variable-specific movements. Following Pesaran (2006), we estimate the common factors consistently by cross-sectional averages of the country-specific variables (synchronization, FDI, trade and

sectoral differences) and their lagged values. In general, results are qualitatively very similar to those reported in table 3 with year dummies, the only exception being the parsimonious specification with a negative trade coefficient which is significant at the 10% level. But Hansen's J test rejects the validity of instruments for this specification pointing to inconsistent estimates. Quantitative changes occurred only in the FDI coefficient which is about 20% higher in all specification when cross-sectional averages are included.

Estimation in Log-like Transformation We estimate our model not only in levels but also in a log-like transformation following Levy Yeyati, Panizza, and Stein (2007) which for a variable x can be written as[14]

$$loglike(x) = sign(x) * ln(1 + abs(x))$$

Results produced by estimating the transformed system do not differ significantly from the ones of the basic specification and are not reported.

Estimating the Indirect Effects Most studies on the determinants of business cycles building on the system proposed by Imbs (2004) provide estimates of the remaining equations of the system. An estimation of these equations is useful to disentangle the indirect effects of determinants resulting from their interdependence, e.g. we would know whether trade linkages indirectly foster synchronization by enhancing FDI or decrease the differences in the sector composition. In our attempt to identify these relations, we came across the same problem in all three equations: Our available instrument sets were rejected by Hansen's J test in almost all cases. One of the possible reasons may be the close relation of trade and FDI, which are determined by very similar factors. This makes it difficult to find an instrument which is correlated to the one and exogenous to the other of the two. If the exogeneity condition for the instruments is not met, inconsistent estimated coefficients are the consequence. Therefore we refrain from reporting non properly identified indirect effects here. Previous studies reporting estimates for these relations either worked with exactly identified systems where overidentifying tests can not be applied or without reporting tests of their instrumentation.

6 Conclusions

We readdressed the determinants of business cycle synchronization in this paper to test, on the one hand whether FDI promoting policies may have consequences on the business cycle behaviour, and on the other hand whether more plausible identification strategies

[14]This more complicated transformation is necessary, since FDI positions and in consequence our measure for bilateral FDI intensity can be negative and are therefore not compatible with a simple logarithmic transformation.

change previous results. Understanding the determinants of synchronization is important, since a considerable degree of cyclical co-movement is important for the efficiency of a common monetary policy in a currency union. This fact became especially evident in the light of the past years, when the heterogeneity in economic development between the countries in the Euro-zone increased forcing the European Central Bank (ECB) to use country targeted policy measures in addition to the common interest rate. Since these measures are highly disputed by experts and come at a risk, the ECB plans to abandon the non-standard measures once its member countries exhibit a stable and more similar economic development. Our results suggest that the beneficial effects of trade integration for the similarity of business cycles are less robust than previously thought. One explanation for this result is, that trade moves together with business cycle synchronization because of common shocks. In contrast, linkages through foreign direct investment are found to contribute in most cases positively to the synchronization between concerned countries. This implies that policies to attract more FDI from abroad go, in general, hand in hand with an increased similarity of business cycles with these international partners. In the specific case of bilateral synchronization between EMU members we do not identify a positive significant effect for the long sample but also no negative one. Thus, our results suggest no conflict of goals between policies to promote FDI and the necessary synchronization of business cycles in the EMU. Furthermore, we find that larger differences in the sector structure between two economies result in a bigger gap between their business cycles.

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A Measures and Data Sources

Synchronization: Negative absolute difference of real GDP growth, see equation 6. *Source:* OECD Economic Outlook.
FDI integration: Sum of bilateral FDI inward and outward positions divided by the sum of nominal GDP, see equation 7. *Source:* OECD International Direct Investment

Statistics; World Bank, World Development Indicators.

Trade integration: Bilateral import and export divided by the sum of nominal GDP, see equation 8. *Source:* IMF, Direction of Trade Statistics; World Bank, World Development Indicators.

Differences in the sector structure: Sum over negative absolute differences between value added shares for 41 sectors, see equation 9. *Source:* OECD STAN database.

Monetary policy: Absolute difference in short term interest rates (three month nominal interest rate, mainly interbank rates). *Source:* OECD Economic Outlook.

Fiscal policy: Absolute difference in government budget balance. *Source:* IMF, World Economic Outlook April 2012.

Return spreads between share price indices: Absolute difference in growth of share price index. *Source:* IMF, IFS

Volume-based measure of capital openness: Bilateral sum of gross private capital flows ratio to GDP. *Source:* World Bank WDI.

Overall economic development: Bilateral sum of GDP per capita (in PPP). *Source:* World Bank, International Comparison Program database.

Economic similarity: Indicator based on nominal GDP following Egger (2000), see equation 10. *Source:* World Bank, World Development Indicators.

De jure economic integration: Ranking of bilateral degree of economic integration. *Source:* Baier and Bergstrand (2007), Database on Economic Integration Agreements.

Differences in economic development: Absolute differences in GDP per capita (in PPP). *Source:* World Bank, International Comparison Program database.

Distance between the main economic centers: mean of (by population) weighted distances between biggest cities/areas. *Source:* CEPII, Gravity dataset, http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=8.

Common border: Dummy variables with value 1 if countries have a common border and 0 otherwise. *Source:* CEPII, Gravity dataset, http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=8.

Table 7: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Synchronization	3360	-0.017	0.017	-0.169	0.000
FDI	2744	0.006	0.012	-0.001	0.119
Trade	3360	0.006	0.008	0.000	0.039
Sectoral Differences	2685	0.329	0.106	0.107	0.823
Monetary policy	3360	0.030	0.033	0.000	0.189
Fiscal policy	2454	0.047	0.044	0.000	0.285
Return Spread	3022	0.173	0.202	0.000	2.115
Capital Openess	3345	-0.001	0.006	-0.036	0.030
Economic Similarity	3360	0.298	0.155	0.021	0.500
Economic Development	3360	5.390	1.104	2.760	9.289
Development Differences	3360	0.583	0.474	0.000	2.711

B Additional Tables

Table 8: FE2SLS vs. EC2SLS

Dependent Variable	Synchronization	Synchronization	Synchronization
Period	1982-2009	1982-1994	1995-2009
FDI	0.775	142.363	-0.085
	(0.734)	(679.389)	(0.567)
Trade	4.435	1.709	3.009
	(3.996)	(63.364)	(9.393)
Sectoral Differences	0.043	-0.061	-0.219
	(0.088)	(2.636)	(0.191)
Monetary Policy	-0.048	0.102	-0.205
	(0.077)	(0.683)	(0.124)*
Fiscal Policy	0.090	-0.026	0.111
	(0.054)*	(1.376)	(0.067)*
Year Dummies	Yes	Yes	Yes
N	1,793	331	1,462
Hausman Test FE2SLS vs. EC2SLS			
χ^2 (d.f.)	4.53 (32)	.35 (6)	9.02 (7)
p-value	1	.999	.25

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9: EC2SLS with additional instruments for 1995 to 2009

	(1)	(2)	(3)	(4)	(5)
Instrumentation	Pars.	Ec. Diff.	Return Spread	EIA	L.FDI
FDI	0.176	0.215	0.200	0.301	-0.056
	(0.116)	(0.107)**	(0.112)*	(0.174)*	(0.061)
Trade	-0.005	-0.046	-0.076	-0.004	0.191
	(0.198)	(0.185)	(0.189)	(0.262)	(0.166)
Sectoral Differences	-0.034	-0.033	-0.034	-0.034	-0.035
	(0.009)***	(0.008)***	(0.008)***	(0.011)***	(0.010)***
Monetary Policy	-0.117	-0.120	-0.122	-0.109	-0.093
	(0.028)***	(0.027)***	(0.027)***	(0.031)***	(0.027)***
Fiscal Policy	0.051	0.053	0.051	0.049	0.040
	(0.015)***	(0.014)***	(0.015)***	(0.020)**	(0.015)***
Year Dummies	Yes	Yes	Yes	Yes	Yes
Period	1982-2009	1982-2009	1982-2009	1988-2005	1983-2009
N	1,462	1,462	1,462	1,146	1,437
Hansen's J Test					
χ^2 (d.f.)	20.08 (17)	22.06 (19)	29.5 (19)	14.09 (15)	20.88 (20)
p-value	.27	.281	.058	.519	.404

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

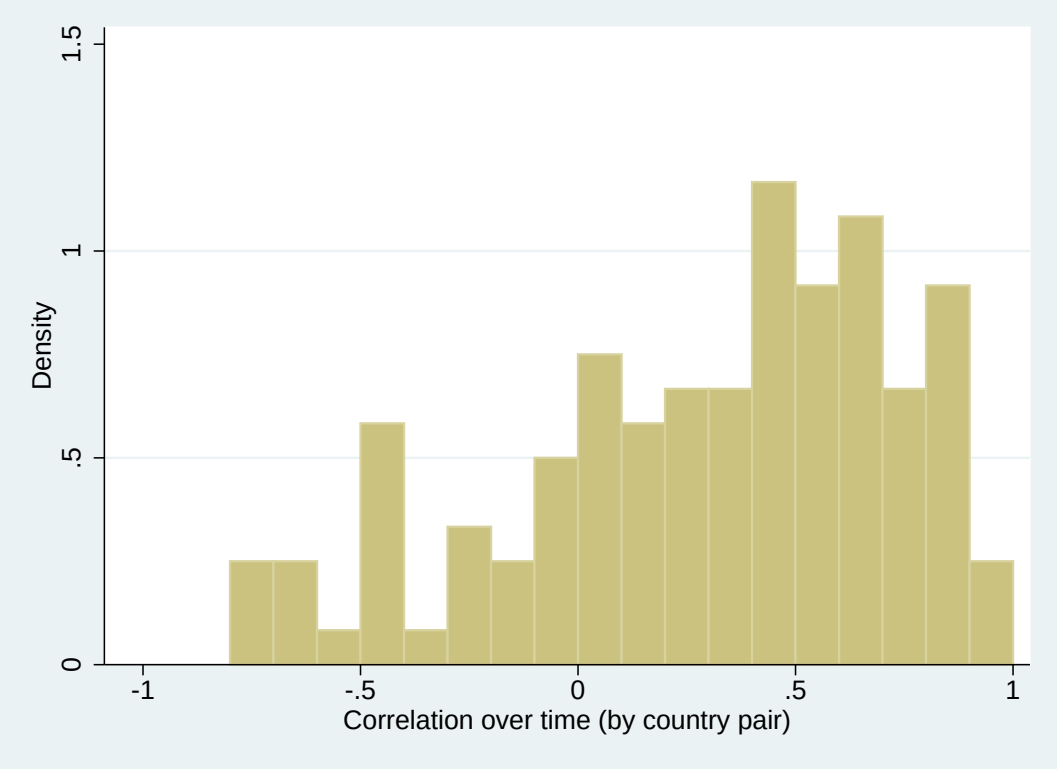

Figure 2: Distribution of "within"-correlation of trade and FDI

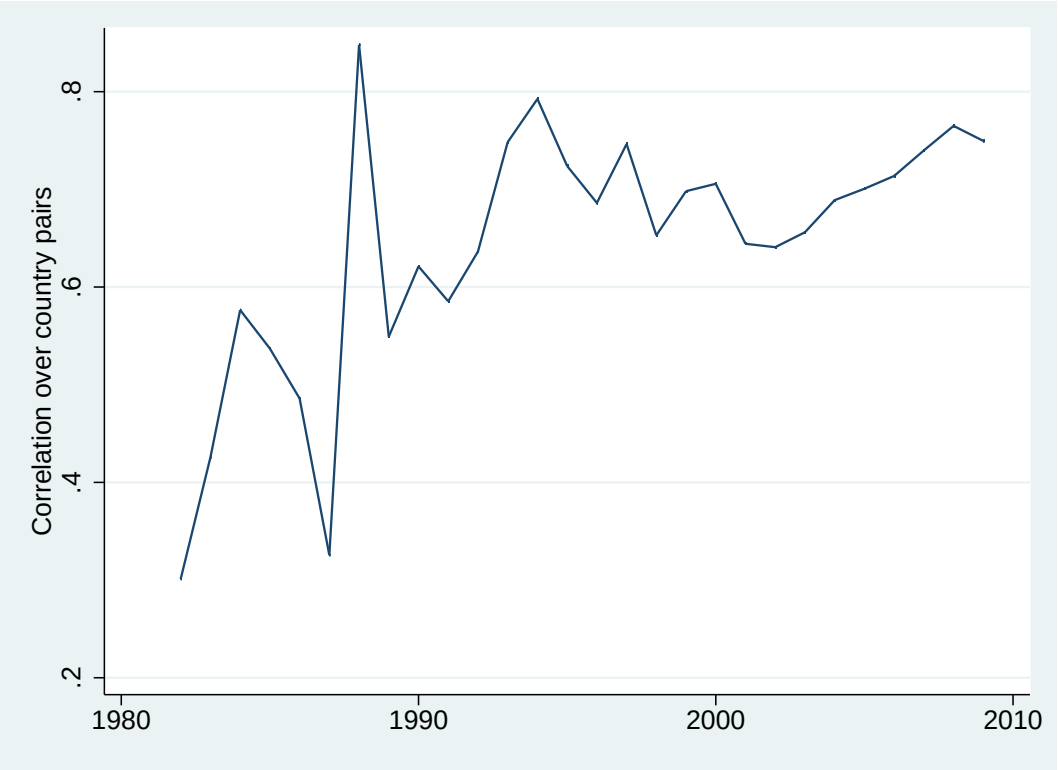

Figure 3: Evolution of "between"-correlation of trade and FDI

(Spillover) Effects of Labour Market Reforms in Germany and France

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Authors: Claudia Busl (ZEW), Atilim Seymen (ZEW)

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(Spillover) Effects of Labour Market Reforms in Germany and France*

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June 24, 2013

Abstract

In this paper we analyze the (potential) effects of labour market and fiscal policy reforms by heterogeneous European countries—Germany and France—on the domestic and foreign economy. We test the implications of the gains in matching efficiency and reduced unemployment benefits induced by the German Hartz reforms in a two-country RBC model with frictions in the labour market, which replicates the data quite well. We then explore the reform possibilities in the French labour market and their potential (inter)national effects by calibrating the model to recent data. Both home and foreign economies benefit from labour market reforms in the home economy in our framework.

JEL classification: E24, E61, E65, F42, J38, J63

Keywords: Labour market reforms, search and matching, dynamic stochastic general equilibrium models

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1 Introduction

Structural reforms have often been mentioned as one of the conditions in financial support programs for troubled countries during the recent global financial and economic crisis. Publications of international institutions like the IMF and the OECD repeatedly emphasize the need for structural reforms "for a strong and balanced economic recovery".[1] Currently, the room for fiscal policy measures to stimulate growth in staggering European countries is limited because of the high debt burden of almost all European economies. Monetary policy, on the other hand, seems to have reached its limits as a stimulator of the economies after having already used a number of drastic measures and can only try to keep the financial environment tranquil and stable to give room to in-depth reforms.

Given this background, the aim of this paper is to analyze the macroeconomic (spillover) effects of structural reforms by means of a two-country dynamic stochastic general equilibrium (DSGE) model. While the term "structural reforms" may cover a large number of policy measures and areas, the focus of our paper is on the impact of labour market reforms in an international setting. Changes in the labour market institutions seem of great relevance in Europe given the high unemployment figures in many countries. We calibrate our model to selected European economies—Germany and France—and use it for addressing the following questions:

- Is our model able to capture the quantitative effects of labour market reforms on the main economic aggregates in Germany?
- How do changes in institutions impact on domestic and foreign economies in a two-country world?
- Through which mechanisms do spillovers occur and how strong are they quantitatively?
- What does our model predict with respect to the effects of recently undertaken reforms in France?
- How effective are other plausible reform scenarios in reducing unemployment given the restrictions to public spending?

[1] See, e.g., IMF (2013) and OECD (2013).

The model that serves as the laboratory for our quantitative analysis is taken from Fonseca, Patureau, and Sopraseuth (2009). It is a two-country real business cycle (RBC) model with matching frictions in the labour market. The model comprises two building blocks which are of crucial importance for the analysis we carry out. First, it allows for international macroeconomic spillovers through two channels: (i) international goods trade and (ii) international financial assets. To be more specific, each country specializes in the production of her own good, whereas consumers in both countries consume a composite good comprising the goods of both countries. Furthermore, there is a riskless nominal interest rate bond that helps to enhance the sharing of resources internationally. The second crucial aspect of the model for our analysis is that it features several labour market institutions and fiscal policy parameters. In particular, unemployment results from search and matching frictions in the labour market. The model comprises parameters for the matching efficiency in the labour market and the unemployment benefit ratio both of which policy-makers can control up to some extent. Furthermore, macroeconomic policy directly dictates the rates for three types of taxes in the model: consumption and employers and employee's labour tax rates. We calibrate the model economy by using the same values for most of the parameters in both countries and yet allow heterogeneity in the aforementioned parameters that relate to labour market institutions and fiscal policy. Such a way of calibration allows us isolate the impact of selected institutional differences and abstract from differences in other parameters such as the labour share in output or the depreciation rate of capital.

Our analysis consists of three steps: In our first quantitative exercise, the heterogeneous parameters are initially set in line with the institutional characteristics of Germany and France in 2003. This is the year in which Germany started to introduce its labour market reforms, the so-called Hartz reforms, that are widely seen as a major factor behind the impressive labour market (and also general macroeconomic) performance of Germany in recent years.[2] We then introduce two types of labour market reforms into the German economy: (i) an exogenous increase in matching efficiency in the labour market which mimics the first part of the reforms making the organization of public employment services more efficient and (ii) a decline in the unemployment benefit ratio introduced by the last labour market

[2]See, e.g., Burda and Hunt (2011) and the references therein.

reform law, both of which are in line with the corresponding observations in 2010 compared to 2003. When these two reforms are introduced into the model simultaneously, the model is quite successful in capturing the change in various quantities such as unemployment rate, employment, average hours worked and wages from 2003 to 2010 in Germany. Furthermore, we discuss the spillover effects implied by the reforms on the "French" economy.

Our second experiment deals with reforms currently being implemented in France which consist in lowering labour costs for employers balanced by higher consumption taxes and measures to increase the matching efficiency. We initially explore the predictions of our model as to the potential effects of these reforms, where the heterogeneous labour market institutions are calibrated to the French and German situation in 2010. Our results reveal non-trivial effects of reforms on the unemployment rate and several other macroeconomic quantities in France. In a next step, we test the effects of further plausible reform scenarios. Specifically, given the restrictions to public spending and the positive impact of the decline in the unemployment benefit share on strong employment and output performance of Germany, we investigate the impact of reforms in the hypothetical case where the unemployment benefit share is reduced in order to create even further room to decrease the employers' tax rate. Not surprisingly, the impact of reforms gets yet stronger under such a constellation.

The domestic impact of labour market reforms could be quite significant according to our findings. The exact amount depends on by how much the matching efficiency of the labour market can be increased. As has already been discussed elsewhere in the literature (e.g. Dao (2013a)), the existence of labour market rigidities in the form of search and matching frictions is the attribute of our model which leads to positive international spillovers. Note that such rigidities are deemed rather typical for European economies. Our analysis thus shows that, rather than being detrimental for other countries, domestic labour market reforms impact positively on other countries which is consistent with empirical evidence by Felbermayr, Larch, and Lechthaler (2013). Quantitatively, we find that the long-run increase in the capital stock of the foreign country is roughly one third of the increase in the capital stock of the reforming country.

We present our model framework in the next section. Section 3 investigates the impact of German Hartz reforms on both Germany and "France" and provides sensitivity analyses

as to the parameters of the model with the largest potential impact on our quantitative findings. The subject of Section 4 is the reform possibilities in France in the light of the recently introduced reforms in the country as well as the German Hartz reforms experience. The last section concludes and provides several critical remarks on our findings.

2 The Model

In this section, we describe our model framework which is a two-country RBC model with matching frictions in the labour market and closely follows Fonseca, Patureau, and Sopraseuth (2009). If not stated otherwise, we describe the decision problems of households and firms in the home country, called country 1. The problem set of the foreign country can be found in Appendix A.

2.1 Households

Each country is inhabited by an infinitely living mass of agents normalized to unity. Agents maximize their intertemporal utility at the beginning of each period without knowing whether they will end up unemployed or not. But since they are assumed to be risk averse and have access to complete income insurance markets, their decisions are independent of their individual labour market outcome. Only the aggregate outcome and, correspondingly, the probability of being employed N_{it} in country i at period t matter. A representative agent in country 1 maximizes her expected life-time utility

$$E_0 \sum_{t=0}^{\infty} \beta^t \left[N_{1t} U(C_{1t}^n, h_{1t}) + (1 - N_{1t}) U(C_{1t}^u) \right] \tag{1}$$

where $0 < \beta < 1$ is the discount factor, C_{1t}^n and C_{1t}^u denote consumption in case of employment and unemployment, respectively, and h_{1t} represents the number of hours worked by an employed agent. The number of hours per period is normalized to unity. Thus, time spend on leisure is given by $1 - h_{1t}$. The per-period utility functions of employed and unemployed

individuals are additively separable in consumption and leisure and given by

$$U(C^n_{1t}, h_{1t}) = log\left(C^n_{1t}\right) + \kappa^n_1 \frac{\left(1-h_{1t}\right)^{1-\xi}}{1-\xi} \tag{2}$$

$$U(C^u_{1t}) = log\left(C^u_{1t}\right) + \kappa^u_1 \tag{3}$$

with κ^n_1 and κ^u_1 being parameters that affect and determine the value of leisure for employed and unemployed agents, respectively, and $\frac{1}{\xi}$ measuring the intertemporal elasticity of substitution of leisure with $\xi > 0$. Agents receive the income $w_{1t}h_{1t}$ from employment, w_{1t} being the hourly wage rate, subject to an employees' labour tax τ^d_1 when they are employed and fixed unemployment benefits b_1 otherwise. In addition, there are direct transfers from the government to households (or lump-sum taxes on households depending on whether the consumption and labour tax revenues are enough to cover the unemployment benefit payments) amounting to T_{1t} and the profits Π_{1t} accruing from the domestic firms owned by the households. Furthermore, agents can hold bonds denominated in terms of the domestic good available in an international bond market which yield an interest payment i_t for each unit. Households spend their income on consumption including a consumption tax τ^c_1 and on new bond holdings B_{1t+1}. If the household changes its bond holdings, it faces a portfolio adjustment cost CA_{1t} which is given by

$$CA_{1t} = \frac{\Phi_b}{2}\left(\frac{B_{1t+1}}{P^c_{1t}}\right)^2 \tag{4}$$

that is scaled by the factor $\Phi_b > 0$. The adjustment cost guarantees the stationarity of the model.

Taking the foregoing elements together, the budget constraint of the representative household expressed in terms of the good consumed in country 1 is written as

$$P^c_{1t}\left(1+\tau^c_1\right)C^c_{1t} + B_{1t+1} + P^c_{1t}CA_{1t} = N_{1t}w_{1t}h_{1t}\left(1-\tau^d_1\right) + \left(1-N_{1t}\right)b_1 + B_{1t}\left(1+i_t\right) + T_{1t} + \Pi_{1t} \tag{5}$$

with P^c_{1t} being the consumer price index at home. As will be seen below, both employed and unemployed agents consume the amount C^c_{1t}.

The households' optimization decision problem is summarized by the Bellman equation

$$F_{1t}^{H} = \max_{C_{1t}^{n}, C_{1t}^{u}, B_{1t+1}} \left[N_{1t} U(C_{1t}^{n}, h_{1t}) + (1 - N_{1t}) U(C_{1t}^{u}) + \beta E_t \left(F_{1t+1}^{H} \right) \right] \tag{6}$$

which is subject to the budget constraint (5) and the law of motion of aggregate employment N_{1t}

$$N_{1t+1} = (1 - s_1) N_{1t} + \phi_{1t}(1 - N_{1t}). \tag{7}$$

In this equation, s_1 is the constant job separation rate for employed workers which is exogenously given and ϕ_{1t} the probability of finding a job when being unemployed. Thus, $\phi_{1t}(1 - N_{1t})$ is the number of successful matches which result in hirings H_{1t}. The number of unemployed agents in country 1 is given by $U_{1t} = 1 - N_{1t}$. Since we normalize the mass of the potential workforce to unity, U_{1t} stands for the unemployment rate at the same time. Note that the hours worked h_{1t} do not directly enter the representative household's optimization problem, since they are determined by negotiations between firms and workers through Nash-bargaining which is handled below.

We define λ_{1t} as the Lagrange multiplier corresponding to the budget constraint (5) and derive the first order conditions of the representative agent's optimization problem (6) as follows. With respect to consumption we obtain

$$\frac{1}{C_{1t}^{n}} = \frac{1}{C_{1t}^{u}} = (1 + \tau_1^{c}) \lambda_{1t} P_{1t}^{c}. \tag{8}$$

This condition implies that the optimal level of consumption does not depend on the agents' employment status. Therefore, we call the aggregate level of consumption C_{1t}^{c} in the following. Regarding the bond holdings, the optimality condition is given by

$$1 + \Phi_b \frac{B_{1t+1}}{P_{1t}^{c}} = \beta E_t \left[\frac{\lambda_{1t+1}}{\lambda_{1t}} (1 + i_{t+1}) \right]. \tag{9}$$

The household's preferences in consumption between foreign and domestic goods are modelled by an Armington aggregator. The consumption level of country 1 is hence given

by

$$C_{1t}^{c} = \left[\kappa^{\frac{1}{\eta}} C_{1t}^{\frac{\eta-1}{\eta}} + (1-\kappa)^{\frac{1}{\eta}} C_{2t}^{\frac{\eta-1}{\eta}}\right]^{\frac{\eta}{\eta-1}}, \tag{10}$$

where $0 < \kappa < 1$ is the weight of domestic goods in domestic spending and $\eta > 0$ is the elasticity of substitution between foreign and domestic goods. C_{1t} denotes the domestic consumption of goods produced in country i. We choose the good produced in country 1 to be our numéraire and fix its price P_{1t} to unity. The terms of trade of the foreign country are accordingly given by $P_t = \frac{P_{2t}}{P_{1t}} = P_{2t}$. With these definitions, the minimization of costs for C_{1t}^{c} results in the demand functions for the goods consumed in country 1 that read

$$C_{1t} = \kappa \left(\frac{1}{P_{1t}^{c}}\right)^{-\eta} C_{1t}^{c} \tag{11}$$

$$C_{2t} = (1-\kappa) \left(\frac{P_t}{P_{1t}^{c}}\right)^{-\eta} C_{1t}^{c}. \tag{12}$$

2.2 Firms

In each country a continuum of firms operate in a perfectly competitive market. Firms produce goods with the Cobb-Douglas production technology using domestic labour N_{1t} and capital K_{1t} as input:

$$Y_{1t} = A_{1t} K_{1t}^{\alpha} \left(N_{1t} h_{1t}\right)^{1-\alpha} \tag{13}$$

where $0 < 1-\alpha < 1$ is the labour share of income. In addition, the output level depends on the level of the technology A_{1t} which follows an autoregressive process and is subject to shocks:[3]

$$\log A_{1t+1} = \rho_a \log A_{1t} + (1-\rho_a) \log \bar{A}_1 + \varepsilon_{1t+1}. \tag{14}$$

Firms pay taxes, denoted by τ_1^{f}, on employees' compensation, which contribute to the government budget. Furthermore, they incur a cost $\omega_1 > 0$ to post a vacant job. The aggregated number of vacancies posted is V_{1t}. The number of successful matches in the labour market leading to hirings H_{1t} can be expressed as $q_{1t} V_{1t}$, with q_{1t} being the probability

[3]Note that the form of technological progress does not have any impact on the international spillovers from policy changes that we discuss below.

of finding an appropriate match. Hence, we can rewrite the law of motion of aggregate employment in terms of vacancies as

$$N_{1t+1} = (1 - s_1) N_{1t} + q_{1t} V_{1t}. \tag{15}$$

The accumulation of capital occurs according to the standard law of motion for capital

$$K_{1t+1} = (1 - \delta) K_{1t} + I^c_{1t}, \tag{16}$$

where $0 < \delta < 1$ stands for the capital depreciation rate and investment I^c_{1t} is made up of the same combination of domestic and foreign goods as the consumption basket of households. Firms incur costs when adjusting their capital stock amounting to

$$CI_{1t} = \frac{\Phi_I}{2} \frac{(K_{1t+1} - K_{1t})^2}{K_{1t}}, \tag{17}$$

where $\Phi_I > 0$ is a scaling parameter.

Firms maximize their profits Π_{1t} given by

$$\Pi_{1t} = Y_{1t} - w_{1t} h_{1t} N_{1t} \left(1 + \tau^f_1\right) - \omega_1 P^c_{1t} V_{1t} - P^c_{1t} I^c_{1t} - P^c_{1t} CI_{1t}. \tag{18}$$

Their optimization problem can be summarized as

$$F^F_{1t} = \max_{K_{1t}, N_{1t}} \left[\Pi_{1t} + \beta E_t \left(\frac{\lambda_{1t+1}}{\lambda_{1t}} F^F_{1t+1} \right) \right], \tag{19}$$

subject to the production technology (13), and the law of motion of capital (16) and aggregate employment (15). Firms' future profit flows are weighted by the ratio of the future to the present Lagrange multiplier $\lambda_{1t+1}/\lambda_{1t}$ of household's budget constraint, since households are the owners of the firms. This weight assesses the relative importance of wealth changes for households.

The optimality conditions with respect to capital and labour can be combined in

$$q_{1t}^T = \beta E_t \left[\frac{P_{1t+1}^c \lambda_{1t+1}}{P_{1t}^c \lambda_{1t}} \left\{ \frac{1}{P_{1t+1}^c} \alpha \frac{Y_{1t+1}}{K_{1t+1}} + q_{1t+1}^T - \delta + \frac{\Phi_I}{2} \left(\frac{I_{1t+1}^c - \delta K_{1t+1}}{K_{1t+1}} \right)^2 \right\} \right] \tag{20}$$

$$\frac{\omega_1}{q_{1t}} = \beta E_t \left[\frac{P_{1t+1}^c \lambda_{1t+1}}{P_{1t}^c \lambda_{1t}} \left\{ \frac{1}{P_{1t+1}^c} (1-\alpha) \frac{Y_{1t+1}}{N_{1t+1}} - \frac{1}{P_{1t+1}^c} w_{1t+1} h_{1t+1} \left(1 + \tau_1^f \right) + (1-s_1) \frac{\omega_1}{q_{1t+1}} \right\} \right] \tag{21}$$

In equation (20), we use Tobin's q (q_{1t}^T) defined as

$$q_{1t}^T = 1 + \Phi_I \frac{I_{1t}^c - \delta K_{1t}}{K_{1t}} \tag{22}$$

2.3 Matching and Bargaining in the Labour Market

Successful matching of vacancies and unemployed results in hirings according to the following constant returns-to-scale technology proposed by Pissarides (2000):

$$H_{1t} = \chi_1 V_{1t}^{\psi} \left(1 - N_{1t}\right)^{1-\psi} \tag{23}$$

where $\chi_1 > 0$ is a parameter that measures the efficiency of the matching process and $0 < \psi < 1$ denotes the elasticity of the matching function with respect to vacancies. Before a match occurs, firms and workers bargain over wages w_{1t} and the number of hours worked per period h_{1t} within a Nash bargaining framework. The outcome of the negotiation process is obtained by maximizing the weighted marginal value of the match for both parties:

$$\underset{w_{1t}, h_{1t}}{max} \left(\lambda_{1t} \frac{\partial F_{1t}^F}{\partial N_{1t}} \right)^{\epsilon} \left(\frac{\partial F_{1t}^H}{\partial N_{1t}} \right)^{1-\epsilon} \tag{24}$$

where $0 < \epsilon < 1$ measures the bargaining power of the firm. For the household the marginal value of a match is given by

$$\frac{\partial F_{1t}^H}{\partial N_{1t}} = \Gamma_{1t}^u - \Gamma_{1t}^n + \lambda_{1t}(w_{1t} h_{1t}(1 - \tau_1^d) - b_1) + (1 - s_i - \phi_{1t}) \beta E_t \left[\frac{\partial F_{1t+1}^H}{\partial N_{1t+1}} \right] \tag{25}$$

For firms it can be written as

$$\frac{\partial F_{1t}^F}{\partial N_{1t}} = (1-\alpha)\frac{Y_{1t}}{h_{1t}N_{1t}}h_{1t} - (1+\tau_1^f)w_{1t}h_{1t} + (1-s_1)\beta E_t\left[\frac{\lambda_{1t+1}}{\lambda_{1t}}\frac{\partial F_{1t+1}^F}{\partial N_{1t+1}}\right] \tag{26}$$

where we assume that the marginal value of work in production is taken as fixed in the bargaining process following Andolfatto (1996).
Defining labour market tightness θ_{1t} as $\frac{V_{1t}}{U_{1t}}$, optimal labour contracts imply

$$w_{1t}h_{1t} = \frac{1-\epsilon}{1+\tau_1^f}\left[\omega_1 P_{1t}^c\theta_{1t} + (1-\alpha)\frac{Y_{1t}}{N_{1t}}\right] + \frac{\epsilon}{1-\tau_1^d}\left[b_1 + \frac{1}{\lambda_{1t}}\left(\kappa_1^u - \kappa_1^n\frac{(1-h_{1t})^{1-\xi}}{1-\xi}\right)\right] \tag{27}$$

$$\frac{\kappa_1^n}{\lambda_{1t}}(1-h_{1t})^{-\xi} = \frac{1-\tau_1^d}{1+\tau_1^f}(1-\alpha)\frac{Y_{1t}}{N_{1t}h_{1t}}. \tag{28}$$

2.4 The Government

The governments in both countries balance their spending on transfers T_{1t} and unemployment benefits b_{1t} with their income from consumption and labour taxation. In case the amount of the unemployment benefits exceeds the tax revenue, the government imposes a lump-sum tax on the household instead of a transfer payment. For the home country the government budget constraint is hence

$$\tau_1^c P_{1t}^c C_{1t}^c + \left(\tau_1^d + \tau_1^f\right) N_{1t}w_{1t}h_{1t} = T_{1t} + (1-N_{1t})\,b_1 \tag{29}$$

With unemployment benefits b_1 fixed, transfer payments endogenously adjust in order to balance the budget.

2.5 Equilibrium

Global equilibrium requires market clearing in financial and goods markets. For the international bond market the equilibrium is defined as

$$B_{1t+1} + B_{2t+1} = 0 \tag{30}$$

In the markets of home and foreign goods, the equilibrium is given by

$$Y_{1t} = \kappa \left(\frac{1}{P^c_{1t}} \right)^{-\eta} D^c_{1t} + (1-\kappa) \left(\frac{1}{P^c_{2t}} \right)^{-\eta} D^c_{2t} \tag{31}$$

$$Y_{2t} = \kappa \left(\frac{P_t}{P^c_{2t}} \right)^{-\eta} D^c_{2t} + (1-\kappa) \left(\frac{P_t}{P^c_{1t}} \right)^{-\eta} D^c_{1t}, \tag{32}$$

where D^c_{it} denotes the aggregate demand in country $i = 1, 2$ which can be expressed as

$$D^c_{it} = C^c_{it} + I^c_{it} + \omega_1 V_{it} + CI_{it} + CA_{it}. \tag{33}$$

Market clearing in the composite good market is obtained if

$$P^c_{1t} D^c_{1t} + P^c_{2t} D^c_{2t} = Y_{1t} + P_t Y_{2t} \tag{34}$$

holds.

Note that, due to Walras' law, one of these market clearing conditions is redundant. Finally, putting equations (5), (18), (29) and (33) together one obtains the evolution of the balance of payments in country 1

$$B_{1t+1} - (1 + i_t) B_{1t} = Y_{1t} - P^c_{1t} D^c_{1t}. \tag{35}$$

3 The Impact of the German Hartz Reforms

In this section, we start out by describing the calibration of our model. Then, we present the results from our first quantitative analysis, where we analyze the impact of the German labour market reforms introduced in 2003 on the German and the "French" economy.[4] Finally, we discuss the sensitivity of our results.

[4]The second economy, of which some labour market characteristics are matched with the French economy and which is not subject to reforms should rather be understood as a hypothetical rest-of-the-world.

Table 1: Symmetric Calibration

Labour market				Production technology				Preferences				Bond market
ϵ	$\bar{\omega}V/Y$	ψ	q	α	h	δ	Φ_I	β	κ	η	ξ	Φ_b/NX
0.5	0.015	0.5	0.7	0.34	0.33	0.025	7	0.99	0.8	1	4	0.0038

3.1 Calibration of the Symmetric Parameters

We calibrate our model for quarterly data and set most of the parameters symmetrically between countries. Allowing heterogeneity only in labour market and fiscal policy parameters, i.e., potential reform parameters, enables us to abstract from differences between the countries that are irrelevant for our analysis. In this subsection, we only discuss the commonly set parameters, which are summarized in Table 1.

Labour Market We follow the literature on labour market rigidities in Europe (see e.g. Faia, Lechthaler, and Merkl (2013)) in choosing $\epsilon = 0.5$, i.e., by splitting the bargaining power in the Nash-bargaining equally between firms and workers. We set the elasticity of vacancies in the matching function ψ likewise to 0.5 in line with estimates by Petrongolo and Pissarides (2001), thus preserving the Hosios condition.[5] The average vacancy posting cost per hire $\omega_i V_i/Y_i$ for country i is set to 0.015 as in Fonseca, Patureau, and Sopraseuth (2009). In setting the probability of filling a vacancy q to 0.7, we choose the lower bound of values used in the literature. q is typically set between 0.7 (den Haan, Ramey, and Watson (2000) and Krause and Lubik (2007)) and 0.9 (Andolfatto (1996) and Hairault (2002)). We prefer 0.7, since it seems more in line with the European case (see Campolmi and Faia (2011)).

Production Technology The production technology parameters are calibrated to reflect the German/European production environment. While the labour share in production has been roughly constant over the past decades in the US, it was subject to a considerable decline in many European countries including Germany and France and the gap between

[5]The condition derived by Hosios (1990) implies that the outcome and thus the level of unemployment in equilibrium is efficient (i.e. welfare maximizing). It is met when the firm's share of surplus is equal to the elasticity of the matching function with respect to vacancies.

the US and Europe has narrowed.[6] In our benchmark calibration we set the elasticity of substitution for capital α in the production function to 0.34 in accordance with German and French data for the past decade. Following the literature, the steady state value of hours worked is set to 1/3 and the capital depreciation rate δ to 0.025.[7] The scaling factor of capital adjustment costs is chosen to be $\Phi_I = 7$, which is taken from Patureau (2007) and reflects the volatility of investment (relative to output) in the G7 countries.[8]

Preferences The discount rate of households is given by $\beta = 0.99$, which corresponds to an annual real interest rate of about 4% according to equation (9) in the steady state.[9] ξ is derived to have the value 4 assuming a (Frisch) labour supply elasticity of $(1-h)/(h \times \xi) = 0.5$ following the recommendation of Chetty, Guren, Manoli, and Weber (2011).[10] The elasticity of internationally traded goods η is set to 1 as in Fonseca, Patureau, and Sopraseuth (2009). The parameter defining the home bias of consumed products κ is calibrated by setting the import-to-GDP ratio $1-\kappa$ to a value of 0.2 which is the lower bound of total import shares in Germany and France since the introduction of the Euro. This value is higher than 0.1 which is often used in the literature for the US, but considerably lower than the peak of the German import share which exceeds 0.35. Since the home bias in the consumption bundle as well as the elasticity of substitution between domestic and foreign goods might influence spillovers significantly via the trade channel, we carry out a sensitivity analysis

[6] According to the EU KLEMS database, the labour share of income in France declined from 0.75 in the 1970s to 0.65 in the 2000s and in Germany from 0.72 to around 0.66. On the other hand, it shrank only by roughly 0.02 points from 0.64 to 0.62 in the US over the same period. See also Hogrefe and Kappler (2012).

[7] Our results in the next sections are hardly sensitive to the choice of the depreciation rate.

[8] We performed a sensitivity analysis setting Φ_I to very low and very high values. Our quantitative results in the next sections are not sensitive to variations in Φ_I. There occurs only a slight change in the initial dynamics of wages and consumption.

[9] The long term average in annual real interest rates in France and Germany till 2003 amounted to roughly 3 to 4% (depending on the starting year) which would imply a discount rate between 0.993 and 0.99. Considering only the past decade, on the other hand, would yield a significantly lower interest rate of about 1% and a higher discount rate of 0.998. Since our study rests upon a steady state analysis, we deem the long term average to be the appropriate choice. Yet, we checked the implication of lower interest rates and higher discount rates as indicated by the recent past. Since the consequent changes in the response to our reforms are minimal, we refrain from reporting detailed results.

[10] Chetty, Guren, Manoli, and Weber (2011) show that the estimates of the Frisch elasticity of aggregate hours worked differ substantially between micro and macro models, but not the elasticity on the intensive margin. Since our model differentiates between the intensive and extensive margins, we use the value of 0.5 recommended for the Frisch elasticity on the intensive margin. Furthermore, Bargain, Orsini, and Peichl (2011) show that labour supply elasticities do not differ much across countries.

Table 2: Calibration of Heterogeneity in the Labour Market Institutions and Fiscal Policy

		2003		2010	
		France	Germany	France	Germany
$1-N$	Unemployment	8.89	9.81	9.73	7.08
$1/\phi$	Av. duration of unemployment	15.50	9.53	13.30	8.68
ϕ	Job finding probability	19.35	31.48	22.56	34.57
b/wh	Unemployment benefit ratio	35.66	31.89	35.53	21.54
τ_f	Employers' labour tax	26.74	15.40	26.76	15.28
τ_d	Employees' labour tax	9.95	11.42	9.40	11.80
τ_c	Consumption tax	19.05	13.84	18.12	14.53

Note: All numbers are in percentage points except of the average duration of unemployment which is given in months.

with respect to κ and η below.

Finally, the scaling parameter for portfolio adjustment of households Φ_b is derived using empirical estimates of the ratio of the scaling parameter and steady state export share reported to be 0.0038 by Lane and Milesi-Ferretti (2002).

3.2 Calibration of Heterogeneity in Labour Market Institutions and Fiscal Policy

In our basic setup, several parameters and steady state values of variables in country 1 are calibrated to the French situation in 2003, whereas country 2 is matched to German data in 2003. Since our reform scenarios are partially based on institutions observed in 2010, we report for both countries the values corresponding to 2010 as well. The corresponding figures are displayed in Table 2.

We use annual harmonised unemployment rates from the OECD Reference Series Dataset to calibrate the steady state unemployment rate $1-N$. This definition excludes short term fluctuations that last less than one year in unemployment. The job finding probability ϕ is set by using the inverse of the average unemployment duration. Data on average duration of unemployment in months stem from the German Federal Employment Agency (Bunde-

sagentur für Arbeit) and annual publications of the French INSEE. Consequently, we derive the labour market tightness in the steady state from the relationship $\theta = q \times \phi$. We use the data on gross replacement rates (GRR) provided by the OECD in order to obtain the unemployment benefit ratios of both countries and calibrate b_i by setting the steady state value of $b_i/w_i h_i$ equal to the GRR values in the data in 2003.[11] The data on employers' and employees' tax rates on wages (τ^f, τ^d) as well as the consumption tax rate τ^c are constructed using the approach by Nickell (2006) based on the OECD Revenue Statistics and National Accounts.[12] The parameters for the matching efficiency χ_i are calibrated using the steady state relationships of both countries in 2003. The same applies to the parameters κ_i^n and κ_i^u that relate to the impact of leisure on utility.

In the next subsection, we provide a more detailed discussion of the heterogeneity in our calibration of the two countries. Note that this heterogeneity is also accompanied by differences in the exogenously given job separation rate. The steady state condition derived from equation (7) implies $s = \phi(1 - N)/N$, which yields $s_1 = 0.019$ and $s_2 = 0.034$ in our model calibrated based on 2003 values.

3.3 The Impact of the Reforms in Germany

The German labour market performed remarkably well during and in the aftermath of the economic crisis of 2008 and 2009, in contrast to many other countries. Table 2 summarizes a few telling observations. First, between 2003 and 2010, the unemployment rate increased by 0.8 percentage points in France, whereas it decreased by 2.65 percentage points in Germany. Second, the job finding probability increased by roughly 3 percentage points in both countries.[13] Third, the unemployment benefit ratio decreased by more than 10 percentage points in Germany, whereas it stayed constant in France during the period 2003-2010. Fourth, the three tax rates that we focus on in this study stayed roughly constant

[11] The GRR data consist of unemployment insurance and unemployment assistance benefits and do not take tax and social security contributions on earnings and on benefits into account. Furthermore, the GRR data are based on three different household types. They are a weighted average of the payments over the first five years of unemployment with the first year being weighted more heavily.

[12] With some changes caused by changed data availability though. See Appendix B for details.

[13] Note that the average length of unemployment may decrease in times of crisis thus increasing the job finding probability because of a strong increase in the number of short-term unemployed.

over time in both countries. Note, however, that the two countries differ significantly in this respect, particularly in terms of the employers' labour tax rate.

There is still an ongoing discussion in the literature on how much of the German success story is attributable to wage moderation, short-time working benefits, flexible work arrangements and the comprehensive Hartz reforms of the years 2003 to 2005.[14] According to recent studies by Krause and Uhlig (2012) and Krebs and Scheffel (2013), a sizeable part of the reduction in the German unemployment rate, namely about 1.4 to 2.8 percentage points, has been due to the last reform law, Hartz IV, which modified the unemployment benefit and social assistance schemes. But also the earlier laws Hartz I-III, which aimed at increasing the efficiency of job matching, i.e., reducing the time needed for a successful matching of vacant jobs with the unemployed (see, e.g., Fahr and Sunde (2009)), made a significant contribution.[15] The match efficiency refers to the parameter χ_i in the matching function given by equation (23) in our framework. The estimates of Fahr and Sunde (2009) that refer to the impact of the Hartz I/II reforms measured over the period March 2000–December 2003 point to a 5-10% increase in match efficiency. The authors measure the impact of the Hartz III reform over the period March 2003–December 2004 to be somewhat weaker. Yet, the joint impact of the first three reforms of the Hartz package on the match efficiency has been a visible 10-15% within a very short period after their introduction. In a more recent study, Hertweck and Sigrist (2013) estimate the range of increase in the efficiency of the matching process in Western Germany of the combined reforms to lie between 12% and 31%.

The foregoing numbers and studies suggest that a large portion of the strong labour market performance of Germany might be traced back to the increase in the matching efficiency and the decline in the unemployment benefit ratio due to the last reform law, Hartz IV.[16] Therefore, we ask in this subsection to what extent the changes in these two

[14] See, e.g., Burda and Hunt (2011) and the references therein.

[15] Hartz I-III included a number of efforts to improve the matching efficiency by improving the performance of public employment services and of Active Labour Market Policies (ALMP). In specific, the public employment services were modernized in terms of their organizational structure and were geared to be result- and customer-oriented. In addition, incentives for alternative private placement services were introduced to generate market forces and the allocation of measures was subordinated to cost effectiveness. Furthermore, direct integration measures were boosted vis-á-vis training and job creation measures which prevent participants from a fast return into work. See Jacobi and Kluve (2006) for a detailed review of all reform measures.

[16] Hartz IV completely restructured the German unemployment assistance scheme reducing the benefits of

Table 3: Percentage Change in Selected Variables of Germany between 2003 and 2010

	Nh	N	h	w	Y	C	ToT		
							CPI	GDP Defl.	Exports Defl.
Data	2.9	5.0	-1.9	0.7	8.6	3.6	-0.8	-5.9	-4.5
$\chi \uparrow$	1.0	1.7	-0.7	0.4	0.9	1.1		-0.8	
$b \downarrow$	1.3	1.7	-0.4	-0.8	1.1	0.5		-1.0	
$\chi \uparrow$ & $b \downarrow$	2.1	3.1	-1.0	-0.3	1.9	1.5		-1.7	

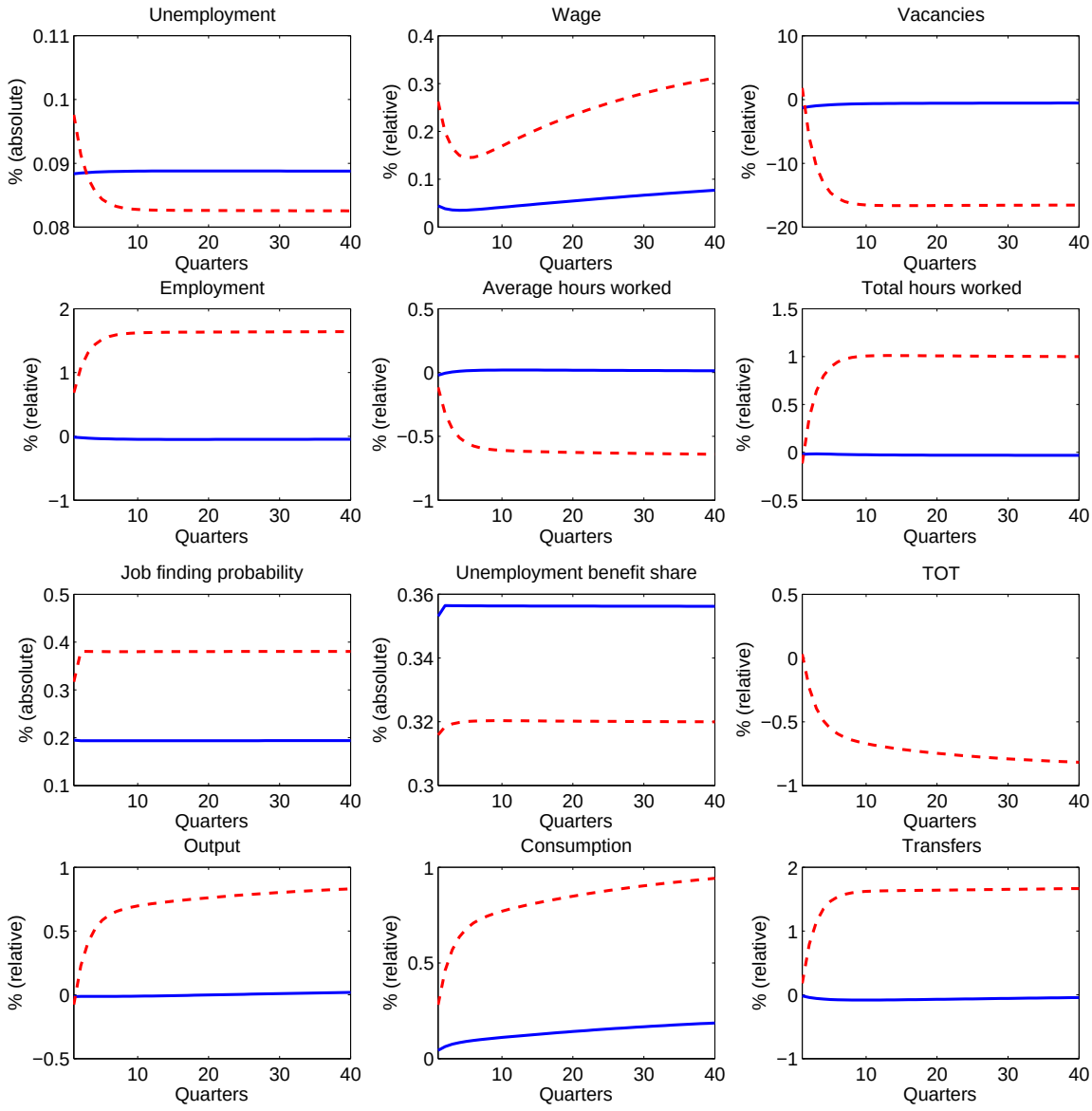
Data source: OECD.Stat Database. *Notes*: ToT stands for terms of trade and relates to P_t in the model. All other variables are as defined in Section 2.

parameters can explain the evolution of several variables in Germany between 2003 and 2010 and how good our model performs in predicting the changes in quantitative terms. However, before we present the results from our quantitative experiments, we find it useful to have a look at the first row of Table 3 which summarizes the evolution in selected variables over the period 2003-2010.[17] We observe that total hours worked increased by 2.9% in Germany over this period. This increase resulted from the increase in employment by 5.0% and occurred despite the decline in average hours worked per worker of 1.9%. At the same time, the real wages stagnated to a large extent and increased by merely 0.7% over the 8-year period. Furthermore, the increase in GDP was with 8.6% much higher than the increase in consumption which was only 3.6% higher in 2010 than its 2003 level. Finally, the terms of trade of Germany in comparison to France declined by 0.8%, 5.9% or 4.5%, depending on whether one refers to the consumer price index, GDP deflator or the deflator for the exports of goods and services, respectively, in the computation.

Increasing the matching efficiency In our first exercise, we increase the matching efficiency parameter by 20% in Germany in line with the estimates provided by Hertweck and Sigrist (2013). Starting out with the parametrization of Germany and France as described above for 2003, the adjustment paths of the selected variables of both economies are illustrated in Figure 1. The corresponding equilibrium effects can be found in the second row of Table 3.

long-term unemployed considerably.

[17] The underlying data are extracted from the OECD.Stat Database.



Notes: Red-dashed (blue-solid) line shows the adjustment in Germany (France) after a 20% increase in the matching efficiency parameter χ of Germany. The initial parametrization follows from the values for Germany and France in 2003 given in Table 2.

Figure 1: Adjustment after a 20% increase in the matching efficiency χ in the German economy

The efficiency increase in matching means that for given levels of vacancies and unemployment more people are hired by firms. In our experiment, the decline in the steady-state vacancy level is 15.1%, whereas the equilibrium output rises by slightly less than 1% over the long run. Hence, the share of vacancy filling costs of firms in national output declines from 1.5% to 1.26%. At the same time, unemployed agents find a job more easily for a given level of vacancies lowering the equilibrium German unemployment rate to a new equilibrium level of 8.2%. Consequently, with a non-increasing labour force in our model world, German employment is predicted to grow by 1.7% in the long run.

With the job finding probability rising by 6.4 percentage points to 38.1% and complete income insurance, the working members of the household slightly decrease their average hours worked by 0.7%, i.e., the income effect dominates, and the hourly wages hence go up by 0.4% in the long run. The combined effect of the changes in employment and hours worked per employee on total hours worked amounts to an increase of 1.0%. Since the increase in wages is accompanied by a decline in hours worked per employee of roughly the same order and the unemployment benefits are fixed, however, the unemployment benefit ratio is hardly affected by the increase in the matching efficiency. Note that the total wage earnings of an employee (wh) decrease by 0.26% in comparison to the former steady state. Nevertheless, the total wage income of the representative household (Nwh) increases by 1.4%, since more members of the household find a job in the new steady state.

Finally, output and consumption respectively increase by 0.9% and 1.1% in the long run following the match efficiency increase. That the consumption increases by slightly more than output in percentage terms reflects the fact that some of the resources that are set free from search activity can be channelled to private consumption.

Decreasing the unemployment benefit ratio While the increase in the matching efficiency reduces the frictions in the labour market and thus facilitates higher output and consumption levels, the impact of the second policy reform that we now analyze, the decline in the unemployment benefit ratio by more than 10 percentage points, impacts directly on the labour supply and reduces the outside option of workers in the Nash bargaining. Note

that the unemployment benefit ratio is not a parameter that we control directly.[18] Therefore, what we do in our exercise is to compute a new unemployment benefit level (b) that is obtained by imposing the unemployment benefit ratio of 2010 in Table 2 to total wage per employee (wh) as computed with our initial calibration with 2003 values for Germany.

The unemployment effects of this reform are similar to the effects of the reforms that increased the matching efficiency as an inspection of Figure 2 and the third row of Table 3 shows. The unemployment rate declines to 8.3%, accompanied by a 1.7% increase in employment, in the long run. Thereby, the deterioration in the bargaining power of workers is the main factor behind the falling wages and corresponding increase in the labour demand. The decline in the unemployment benefit ratio induces more unemployed agents to work at the steady state through the decline in their income. The subsequent decline in wages generates a negative substitution effect on the hours worked of agents in employment and leads the firms to post 22% more vacancies than at the former steady state. Consequently, hirings rise by 1.7% and the job finding probability increases to 38.1% at the steady state.

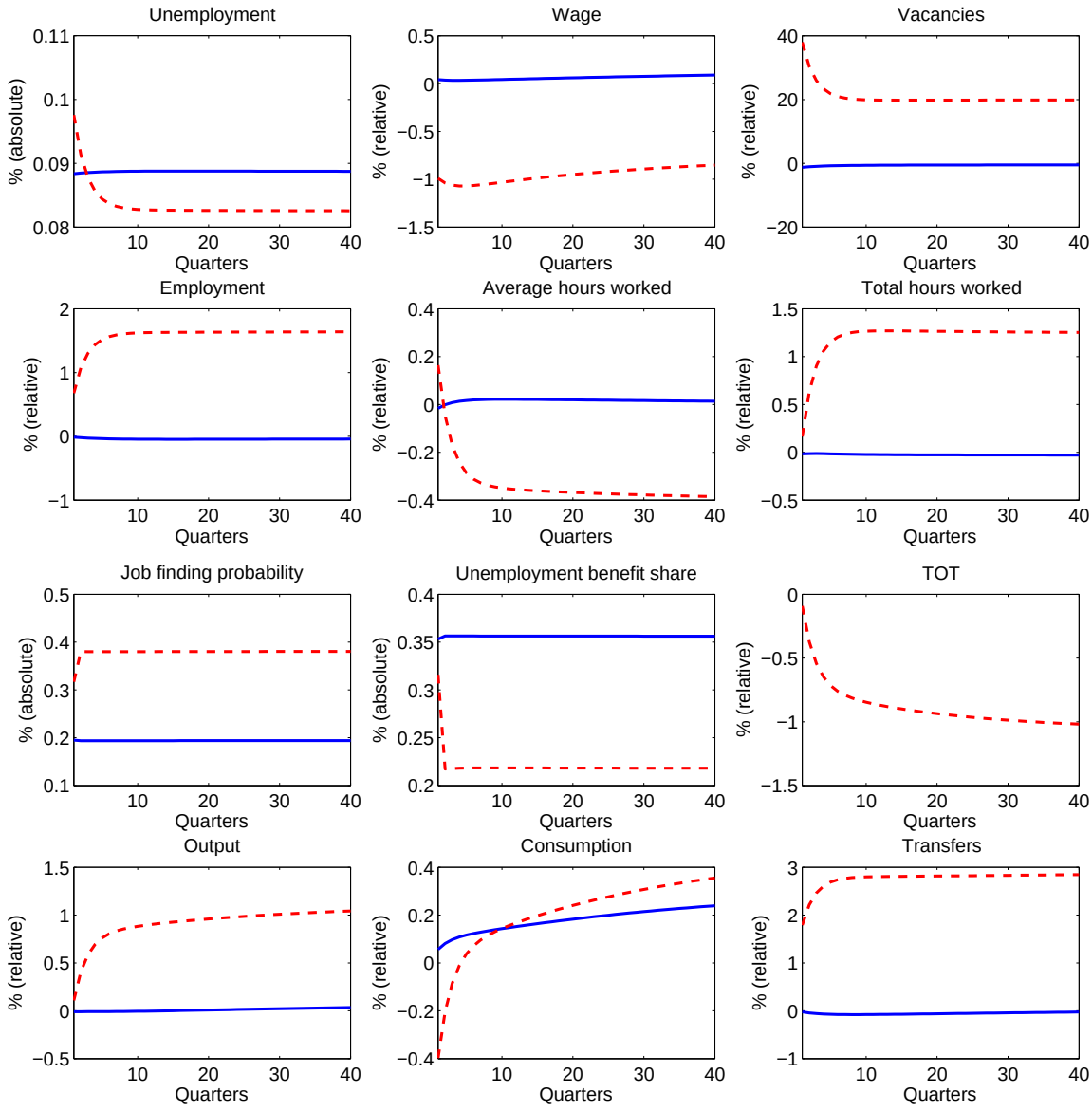
The total hours worked increases more strongly, by 1.3%, after the decline in unemployment benefits than after the increase in the matching efficiency. As to the total income of the households from wages and unemployment benefits, the increase in equilibrium employment more than compensates for the decline in the hourly wages and unemployment benefit level, the total wage and unemployment benefit before-tax income ($Nwh + (1 - N)\, b$) being 2.0% higher at the new steady state. Note that we decrease the unemployment benefit level by 10.35% with this reform in comparison to its 2003 level in Germany. Total wages per employee decline, however, by 1.1% as well. Therefore, the effective decline in the unemployment benefit ratio reads 10.1%.

Despite the significant positive impact of the decline in the unemployment benefit on employment, output is only weakly affected by the reform in the short run, since the income loss

[18] One possibility would be to endogenize the unemployment benefit instead of fixing it to a certain value as, e.g.,

$$b_{it} = rr_i w_{it} h_{it},$$

where rr_i stand for the replacement ratio in country i. Such a modification of the model leads, however, to an implausibly high volatility in the unemployment benefit level as it adjusts to changes in current wages (w) and hours worked per employee (h). Fixing the unemployment benefit ratio only at the steady state is, on the other hand, more successful in reflecting the data.



Notes: Red-dashed (blue-solid) line shows the adjustment in Germany (France) after a 10 percentage point decline in the unemployment benefit ratio of Germany. The initial parametrization follows from the values for Germany and France in 2003 given in Table 2.

Figure 2: Adjustment after a 10 percentage point decline in the unemployment benefit ratio in the German economy

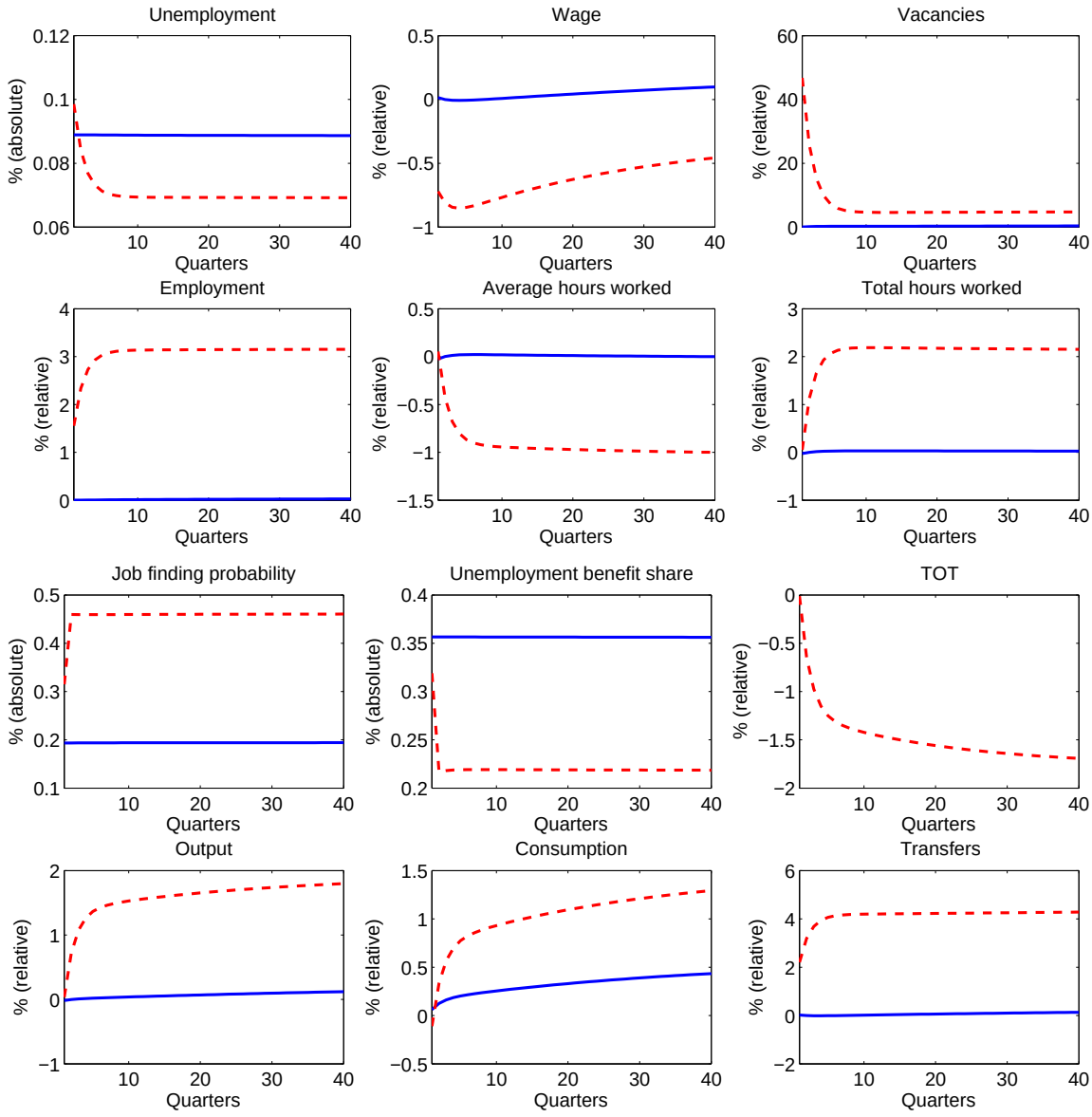
due to the sharp decline in the unemployment benefit and hourly wages depresses the consumption of households strongly. Consumption even declines by 0.4% on impact, although it steeply rises in the periods afterwards for a while and then gradually approaches its new steady state level which is 0.5% higher than its previous steady state level. In contrast to the reform which increases the matching efficiency, the long-run increase in the output level after the decline in the unemployment benefits is with 1.1% more than twice as large as the increase in consumption in terms of percentage points.

Increasing the matching efficiency and decreasing the unemployment benefit ratio simultaneously We now introduce the two reforms simultaneously in the model in order to see to what extent they can account for the changes we observe in the data. The quantitative effects of this exercise are shown in Figure 3 and the fourth row of Table 3. When the reforms are introduced simultaneously, their combined effects are roughly equal to the sum of their individual effects, as a comparison of the sum of the second and third rows of the same table with the numbers in the fourth row suggests. That the sum of the second and third rows is not exactly the same as the fourth row points to the existence of some nonlinearities when the two reforms are introduced simultaneously.

A striking observation is that the model gets most of the qualitative changes in the numbers correct following the two reforms. The only exception to this assessment is the change in the wage rate, which increased by 0.7% in the data and decreases by 0.3% in our calculations.[19] All in all, our quantitative model suggests that these two reforms are able to explain a large portion of what happened in the German data between 2003 and 2010. The estimate of our model of the change in employment (hours worked per employee) is, for example, 3.1% (-1.0%), whereas it happens to be 5.0% (-1.9%) in the data. The total hours worked, which increase by 2.1% due to the two reforms in the model, increased by 2.9% in the data.

As to the output and consumption, the percentage increase in output was with 8.6% more than twice as large as the percentage increase in consumption. The model estimates point, however, to a discrepancy of only 25%, i.e., the output percentage increase must have

[19]This may be due to the fact that we do not take technological improvements into account; see our discussion below.



Notes: Red-dashed (blue-solid) line shows the adjustment in Germany (France) after a 20% increase in the matching efficiency parameter χ and a 10 percentage point decline in the unemployment benefit ratio of Germany. The initial parametrization follows from the values for Germany and France in 2003 given in Table 2.

Figure 3: Adjustment after a 20% increase in the matching efficiency parameter χ and a 10 percentage point decline in the unemployment benefit ratio in the German economy

exceeded the percentage increase in consumption by only a quarter if the only change in the German economy had been the two reforms between 2003 and 2010 according to our model. Furthermore, the model underestimates the increase in output (consumption) by 6.8 (2.1) percentage points. Finally, the model overestimates the decline in the unemployment rate: it must have fallen to 6.9% after the introduction of the two reforms according to the model, while it declined to 7.1% in 2010 in reality.

In general, the calibrated model is able to mimic what happened in the German data to a large extent when it is driven by the increase in the matching efficiency and the decline in the unemployment benefit ratio. The model is certainly not a perfect reflection of reality. An important aspect that we abstract from is the technological improvement that occurred between 2003 and 2010. Assuming a 0.4% average annual improvement in the total factor productivity level, for example, the steady state level of total factor productivity would have exceeded its 2003 level by 2.8% in 2010. That we abstract from this channel probably explains a large part of our underestimation of the growth for almost all variables—particularly output and consumption.

As to the unemployment rate, however, notice that we have overestimated its decline despite the absence of technological improvement. If that factor had also been integrated into our exercise, our overestimation would have been even larger. One partial explanation for this discrepancy could be the absence of demographics from the model. Recall that the working-age population is constant in the model, whereas it declined by 2.1% between 2003 and 2010 in Germany according to the OECD.Stat database. Another partial explanation could be the global financial and economic crisis: the decline in the German unemployment rate might have been closer to the levels estimated by our model, had the crisis not taken place.

All in all, notwithstanding the lack of the aforementioned three factors—technological improvement, demographics and the latest economic crisis—that are abstracted from the model, our quantitative exercise shows that the model does a good job in explaining a large part of what happened in the German data between 2003 and 2010 from a long-run perspective. Therefore, we will use the same framework for evaluating various reform possibilities in France in Section 4.

3.4 International Spillovers

Before discussing the reform potential for the French economy, however, it is in order to discuss the spillover effects of the German reforms on the outside world, i.e., in our case on the "French" economy which is to be interpreted rather as rest of Europe or rest of the world. When our two reforms take effect simultaneously, the long-run increase in French output is 0.2%.[20] The impact on the French consumption is with 0.5% stronger than the impact on output. These effects are driven mainly by the terms-of-trade channel and follow partly from the existence of international capital markets as we show in the following.

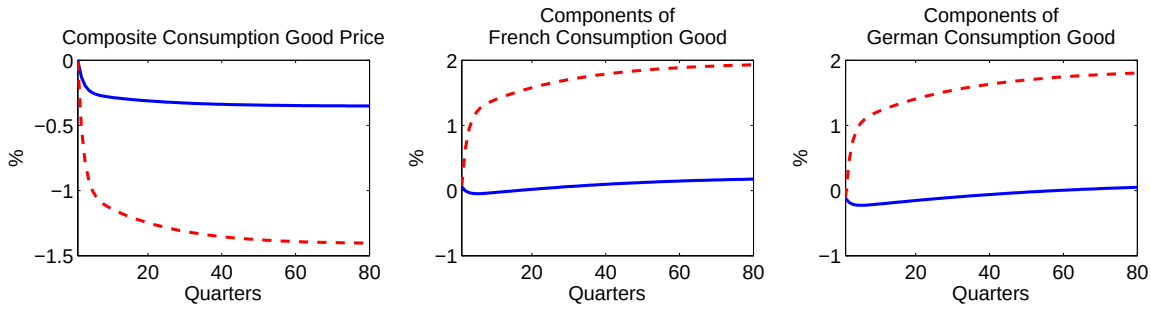
International spillovers are initiated by changes in the terms of trade P_t in our framework, as discussed by Dao (2013a).[21] Following the German reforms, the German output increases, which induces a reduction in the relative price of the German good. The combined effect on the terms of trade of Germany, when the reforms are introduced simultaneously, is a decline of 1.7% as can be seen from Figure 3. Note that this value is in line with what is reported for the change in the German terms of trade vis-à-vis France in the data, see the first row of Table 3. The higher valuation of the French good increases the surplus to be shared between firms and workers through Nash bargaining and has positive employment and output effects on the French economy. It should be noted, however, that the labour market effects of the German reforms on the French economy are rather limited: the French employment hardly moves in the short run and increases negligibly by 0.02% in the long run after the German reforms.

The decline in the terms of trade of Germany manifests itself as a decline in the prices P^c_{1t} and P^c_{2t} of the composite consumption goods of both countries as shown in the first graph of Figure 4.[22] Not surprisingly, the households of both countries increase the amount of the German good that goes into their composite consumption good as the second and third

[20] Just to put the numbers into context, 0.2% of German (French) GDP amounts to 4.9 (3.6) billion EUR in 2012.

[21] Dao (2013a) investigates the international spillover effects of reductions in the employers' labour tax rate. Her main analysis is empirical and based on a panel regression, which is motivated by a two-country model similar to ours. The main differences to our model are that Dao's model excludes the intensive margin of hours worked and the consumption and employees' labour taxes. See also Faia, Lechthaler, and Merkl (2013) who emphasize the role of the terms of trade in international spillovers by means of a labour selection model with turnover costs and Nash-bargained wages.

[22] Note that $P^c_{1t} = \left[\kappa + (1-\kappa)\, P_t^{1-\eta}\right]^{\frac{1}{1-\eta}}$ and $P^c_{2t} = \left[\kappa P_t^{1-\eta} + (1-\kappa)\right]^{\frac{1}{1-\eta}}$.



Notes: In the first graph, red-dashed (blue-solid) line shows the adjustment in Germany (France) after a 20% increase in the matching efficiency parameter χ and a 10 percentage point decline in the unemployment benefit ratio of Germany. In the second and third graphs, red-dashed (blue-solid) lines show the percentage change in the German (French) components of the French and German composite goods, respectively. The initial parametrization follows from the values for Germany and France in 2003 given in Table 2.

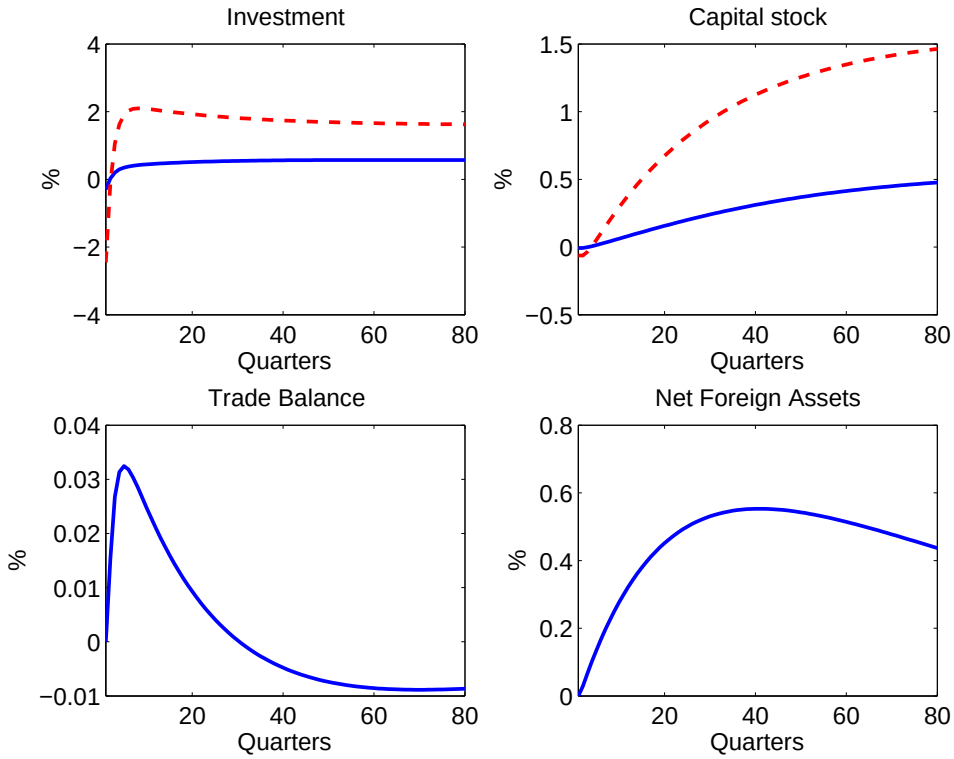
Figure 4: Adjustment after a 20% increase in the matching efficiency parameter χ and a 10 percentage point decline in the unemployment benefit ratio in the German economy

graphs of the same figure illustrate. The amount of the French good in the consumption good of both countries, on the other hand, decreases slightly in the first periods after the joint reforms, whereas it also increases in the long run in both countries.

With the same logic as for consumption, the decline in the German terms of trade renders investments in both German and French economies cheaper.[23] This leads to an increase in investment and hence accumulation of more capital as a result of the reforms in both countries as illustrated in the upper panel of Figure 5. Note that the increase in the German capital stock also partly occurs thanks to the existence of the international bond market. Whereas none of the countries holds any bonds at the steady state in our two-country world, the favourable macroeconomic conditions that follow from reforms in the German economy motivates French households to save some of their gain from German reforms and buy German bonds with those savings which in turn are used for increasing German firms' capital stock even further in the middle run. This is reflected in the positive trade balance of the French economy in the first 6-7 years after the introduction of the German reforms.[24]

[23]Note that there is no distinction between consumption and investment goods in our model economy, i.e. there is only one good of which price has been given in the previous footnote.

[24]Note that the French trade balance reads $Y_{1t} - P^c_{1t}D^c_{1t}$ and the German $P_tY_{2t} - P^c_{2t}D^c_{2t}$.



Notes: Red-dashed (blue-solid) line shows the adjustment in Germany (France) after a 20% increase in the matching efficiency parameter χ and a 10 percentage point decline in the unemployment benefit ratio of Germany. The initial parametrization follows from the values for Germany and France in 2003 given in Table 2.

Figure 5: Adjustment after a 20% increase in the matching efficiency parameter χ and a 10 percentage point decline in the unemployment benefit ratio in the German economy

The French trade balance turns slightly negative after that period and approaches gradually to zero in the very long run. Thereby, the net foreign asset position of France as a share of GDP improves gradually, reaching a share of 0.5% about 40 quarters after the introduction of the reforms as illustrated in Figure 5. These assets are liquidated very slowly after that peak and are mainly used for building capital in France. In the long run, the French capital stock increases by a significant 0.5%, which is about one third of the relative increase in the German capital stock of 1.6%.

There is an ongoing discussion as to the spillover effects of labour market reforms among academicians as well as policy-makers. A popular view is that reforms represent a beggar-thy-neighbour type of policy-making which generates cost advantages for the reforming country vis-à-vis its trading partners, particularly by increasing the relative labour costs.[25] Contrary to this view, Alessandria and Delacroix (2008) find, based on a model with Ricardian trade and without search and matching frictions, that major part of the gains created through labour market reforms is exported to trading partners because of worsened terms of trade. The authors argue that this explains the reluctance for labour market reforms in many countries. Our model belongs to a third group: it implies positive effects on the reforming country and either small and positive or neutral spillover effects of labour market reforms to other countries.

Wage moderation plays a central role in the aforementioned discussion. According to our model, hourly wages increase as a result of a matching efficiency increase in both countries, the increase even being relatively higher in the reforming country. On the other hand, both a reduction of unemployment benefits and a combination of both types of reforms lead to a wage decline (increase) in the home (foreign) country. Nevertheless, combined reforms have virtually no effect on the (un)employment in the foreign country[26] and generate positive effects on output and consumption through the terms-of-trade channel. These results are in line with the empirical findings of Dao (2013a) and Felbermayr, Larch, and Lechthaler (2012a), for example, who report positive spillover effects of a reduction in labour taxes. Our model belongs to the same class of theoretical models used by, e.g., Dao (2013a, 2013b)

[25] See Felbermayr, Larch, and Lechthaler (2012a) for a discussion on the issue.

[26] Only the effect of the German unemployment benefit decline alone on the French employment (unemployment) is slightly—graphically hardly possible to recognize—negative (positive).

and Felbermayr, Larch, and Lechthaler (2013), which generate positive spillovers due to the existence of both intra-industry (Armingtonian) trade and search frictions in the labour market.

Finally, Felbermayr, Larch, and Lechthaler (2012b) find that a multi-country trade model with heterogeneous firms and search-and-matching unemployment underestimates relatively large spillover effects found in the data, as it is the case with our model as well. The authors then introduce real wage rigidity into the model and observe that under perfect real wage rigidity, for example, spillovers of reforms in terms of unemployment to the foreign country can be almost half as large as in the home country. The increase in spillovers with more rigid wages results from the fact that quantities are adjusted even more strongly due to a lack of adjustment possibilities through prices in the latter case. Thus, the quantitative positive spillover effects that we obtain in this paper can be seen to be on a lower bound.

3.5 Short-Run vs. Long-Run Effects

Our hitherto evaluation of the model has focused predominantly on the long-run effects of reforms. Yet, in debates on the implementation of structural reforms, their short-run effects also take a central stage. Indeed, structural reforms may incur costs for states as well as for some groups in the society which may hinder their implementation in practice, although their long-run benefits may by far exceed the short-run costs. Another question of interest is how long it takes for structural reforms to take effect.

An inspection of Figures 1 to 5 shows that the sign of the impact of reforms on both economies is the same in the short and long run. One exception to this observation is the evolution of average hours worked and consumption in Germany after a 10 percentage point decline in the unemployment benefit ratio, depicted in Figure 2. Although the long-run consumption increase following such a reform is 0.5% and the consumption level exceeds its before-reform steady-state level already one year after the reform, the immediate decline in consumption, by 0.4% in the German case, may render the implementation of that reform alone rather difficult. Nevertheless, if the unemployment benefit reform is introduced simultaneously with the matching efficiency reforms, the immediate impact on consumption is

virtually zero and increases gradually following the initial reform period. This result points to the meaningfulness of introducing reforms jointly and the importance of timing. In terms of government budget, on the other hand, both reforms considered for Germany swell the government coffers as the increase in transfers to households indicate. Thus, such type of reforms could even be desirable at times where government debt levels do not allow other measures that would incur costs for the government budget.

With respect to investment in Germany, we observe that the simultaneous introduction of both reforms reduces domestic investments at impact, although they increase significantly in the long run. On the other hand, the capital stock in the German economy shows only a negligible decline at the impact as a result of reforms, since the loss from the decline in investment is compensated by the flow of international bonds, i.e. capital, from France.

As to the adjustment to the new equilibrium after reforms, we can differentiate among three groups of variables. First, job finding probability and unemployment benefit share adjust immediately after the introduction of reforms, both at home and abroad. Second, labour market variables—unemployment, vacancies, employment, average hours worked and total hours worked come very close to their new equilibrium values after reforms within roughly two years. This suggests that labour market reforms of the type considered here lead to a relatively fast adjustment in terms of (un)employment. Third, on the other hand, the adjustment of the remaining variables takes much longer than the ones in the aforementioned two groups. In particular, the very slow adjustment of the trade balance and net foreign assets is responsible for the slow adjustment of output and consumption. It should be noted, however, that a large part of the adjustment in the latter variables occurs within the horizon of the first two years, where the labour markets almost complete their long-run adjustment to reforms. The rest of the adjustment in output and consumption has to do with the accumulation and liquidation of international bonds, is quantitatively small and occurs very slowly over the long run.

3.6 Sensitivity Analysis

In this subsection, we turn our attention to the impact of a few parameters that might influence the quantitative results significantly if set to different values than we used in our exercises, namely the parameters κ and η subsuming preferences with respect to the consumption bundle and those determining the bargaining and the matching function, ϵ and ψ. Note that these are at the same time parameters which are relatively hard to measure. While κ and η may be expected to affect the size of spillovers through the trade channel, ϵ and ψ can in particular affect the impact of reforms in the reforming country by influencing the bargaining power of firms vs. workers. In Table 4 we summarize the reform-induced changes in the steady-state values under different scenarios and compare them with our baseline calibration where $\kappa = 0.8$, $\eta = 1$ and $\epsilon = \psi = 0.5$. The first row of the table states the modification made in comparison to the baseline case.

Differences in the preferences of the consumption good composition The choice of the home-bias κ in the country-specific consumption goods as well as the elasticity of substitution between foreign and domestic goods η both have some impact on the response of domestic and foreign output, consumption, investment and wages in quantitative terms. The qualitative results described in the foregoing section, in contrast, are not altered. These parameters basically determine how the 'cake'—the benefits in terms of economic outcome resulting from the reforms in the home country—is divided up between the foreign and domestic economies. The smaller the home-bias, i.e., κ and the lower the elasticity parameter η the more the foreign country participates in the reform effects. In the first scenario, we set $\kappa = 0.7$ which corresponds to the average import share in Germany in the past decade. Since for η there is no observable empirical counterpart available, we consider a relatively low value of 0.75 suggested by Corsetti, Dedola, and Leduc (2008) and higher value of 1.5 which has often been used in international real business cycle models starting with Backus, Kehoe, and Kydland (1992).

If the share of the domestic good in the foreign consumption bundle is larger (and smaller in the domestic bundle), foreign consumers profit from the price reduction in domestic goods as a result of the reforms more strongly (and domestic consumers accordingly less strongly)

than in the baseline scenario. This goes in line with the fact that the terms of trade P_t drop after reforms less with lower κ. In addition, the adjustment through the international bond market occurs faster leading to a stronger (weaker) increase in investment and capital abroad (at home). Lower values of η imply that consumers in both countries are more prone to adjusting the composition of their final consumption good. Hence, the consumption bundle in both countries is shifted more strongly towards the German good after reforms giving rise to similar effects as with a lower home bias in the composition. The adjustments in the labour market in terms of employment, hours worked or unemployment after the reform are hardly effected by changes in the preference parameters. To summarize, alternative values for κ and η change the size of spillovers and thus the division of reform effects between countries, but the qualitative effects of the reforms remain unaltered.

Changes in the bargaining power and the elasticity of the matching function Since the bargaining power of firms versus workers is hard to measure, we used the balancing value of 0.5 in our baseline scenario. Furthermore, we set the elasticity of unemployment in the matching function $1 - \psi = 0.5$ and are thus at the lower bound of the range from 0.5 to 0.7 labeled plausible by Petrongolo and Pissarides (2001). We test the sensitivity of these choices by calculating the reform effects when ϵ and ψ respectively take a lower value of 0.4. Higher bargaining power of workers in Europe vis-á-vis Anglo-Saxon countries, referred to in many studies where ϵ is set to 0.5, seems a plausible scenario, since union coverage is higher and may play an important role in the bargaining process. The results of both scenarios are displayed in the last two columns of Table 4.

By comparing the implied outcomes with our baseline calibration (in the first column), the importance of these parameters becomes clear. Both scenarios imply sizeable quantitative changes but no qualitative changes to our conclusions from above. With lower ϵ or ψ the reforms have weaker effects in the labour market reducing thus the gains in economic output.

If workers' bargaining power is higher, i.e., $\epsilon < 0.5$, the response of domestic as well as foreign variables to the reforms is dampened considerably. Due to their increased power in the Nash-bargaining, employees obtain higher wages and work on average more than in the baseline case, i.e., the income effect prevails. As firms post less vacancies, the job finding

probability is reduced and the increase of employment in steady state is lower. Consequently, the increase in domestic output, consumption and investment is less pronounced in this scenario. Finally, terms of trade and net foreign asset position exhibit a weaker response which implies smaller spillover effects for France.

Similarly, we observe smaller effects of the reforms on the economy, in comparison to the benchmark case, if a lower elasticity of vacancies (and hence a higher elasticity of unemployment) is assumed. However, wages shrink less and firms increase their vacancy posting relative to the steady state stronger than in the baseline scenario coming from lower steady state value though (since posting an additional vacancy is not as effective as before). This comprises higher search costs for firms which are passed over to workers in the bargaining process resulting in lower wages, as mentioned. That in turn induces workers to reduce their hours worked a little less than in the baseline case, i.e., the substitution effect prevails.

4 Reform Possibilities in France

The strong labour market performance of the German economy, particularly the decline in its unemployment rate even during the global financial and economic crisis, has been praised in a number of reports by international institutions[27] and motivated labour market reforms in other countries. Thereby, it is not to forget that countries may differ substantially in terms of their labour market institutions. Moreover, the fiscal space of many countries has been restricted due to the strong and still ongoing impacts of the 2008-2009 recession. Both of these factors crucially shape the extent to which German type reforms can be introduced in other countries. In this section, we turn our attention to reform possibilities in the French economy in the light of our hitherto discussion with respect to German Hartz reforms. To this end, we use as initial steady state the institutional framework of France and "Germany " in 2010 and investigate the potential impact of various reform possibilities in the same way as in the previous section.

France has already initiated a reform to raise the matching efficiency in its labour market. According to its 2012 National Reform Programme (NRP), a report which all members of

[27] See, e.g., ECB (2012).

Table 4: Sensitivity Scenarios: Percentage Change in Selected Variables after Reforming χ and b in Germany

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parameters		Baseline	$\kappa = .7$	$\eta = .75$	$\eta = 1.5$	$\psi = .4$	$\epsilon = .4$
Germany	Nh	2.15	2.14	2.14	2.15	1.98	1.87
	N	3.21	3.20	3.20	3.22	2.91	2.84
	U	-2.90	-2.89	-2.89	-2.90	-2.63	-2.56
	ϕ	14.63	14.57	14.56	14.68	12.76	12.35
	h	-1.03	-1.03	-1.03	-1.03	-0.91	-0.95
	w	-0.28	-0.35	-0.37	-0.21	-0.38	-0.10
	Y	1.96	1.89	1.87	2.04	1.81	1.71
	C	1.54	1.34	1.27	1.76	1.34	1.44
	I	1.61	1.40	1.34	1.83	1.48	1.40
	P	-1.73	-1.58	-2.55	-1.05	-1.59	-1.51
France	Nh	0.02	0.03	0.03	0.01	0.02	0.02
	N	0.04	0.05	0.05	0.02	0.03	0.03
	U	-0.03	-0.05	-0.05	-0.02	-0.02	-0.03
	ϕ	0.08	0.11	0.12	0.05	0.06	0.06
	h	-0.01	-0.02	-0.02	-0.01	-0.01	-0.01
	w	0.18	0.25	0.27	0.11	0.17	0.16
	Y	0.20	0.28	0.30	0.12	0.18	0.18
	C	0.55	0.76	0.82	0.34	0.51	0.48
	I	0.55	0.76	0.82	0.33	0.51	0.48
	P	-1.73	-1.58	-2.55	-1.05	-1.59	-1.51

Notes: In the baseline scenario $\kappa = 0.8$, $\eta = 1$ and $\epsilon = \psi = 0.5$. Percentage change in U und ϕ is absolute, in all other variables relative.

the EU are obliged to issue annually due to the Stability and Growth Pact (SGP), France has signed an agreement with the EU in January 2012 to improve the organization of the decision-making process of the Public Employment Service (Pôle Emploi) quite in the spirit of Hartz I-III reforms of Germany discussed above. The agreement targets at personalizing services and enhancing support functions, improving local coordination and optimizing the effective allocation of resources. In terms of our model, this reform can be expected to increase the matching efficiency χ_i of the French labour market.

Another concern in the discussion about labour market reforms is the need for a reduction in labour costs in order to enhance the competitiveness of a national economy.[28] Therefore, a reform initiative has been in the field of fiscal policy, where France shifts tax burden away from labour. Notably, the country adopted a 1.6 percentage points increase in the VAT while lowering employers' social contribution. In the "Council Recommendation on the National Reform Programme 2012" of France, the European Council recommends further reforms to improve the international cost competitiveness of French firms financed by an additional raise in consumption taxation.

Note that both the improvements in the Public Employment Service and the reduction of labour costs through lowering employers' taxes can have negative effects on the government budget with potential detrimental effects on the economy. In particular, although the costs of the Public Employment Service reforms may be small and offset by the gains through increases in the matching efficiency within a very short period of time, the cost of lowering employers' social contribution can be larger and permanent. Furthermore, the French gross government debt-to-GDP ratio was above the SGP criteria of 60% even prior to the 2008-2009 crisis and has risen to above 80% in the aftermath of the crisis. The IMF (2013) database estimates expect it to stay around 90% in the coming years. This is probably why the European Council recommends the lowering of employers' social contribution to be accompanied by a VAT increase.

In our model framework, we do not directly include government debt. Yet, the transfers T_{it} in the government budget constraint (29) can serve as a proxy for government debt.[29]

[28] See, e.g., Dao (2013b, 2013a).

[29] Negative transfers mean a lump-sum tax on households through the household budget constraint (5). However, transfers are positive with the calibration that we use in this paper at the steady state.

Therefore, an increase (a decline) in transfers is taken for an improvement (a worsening) in (of) government debt in the following. In Figures 1 and 3, we observe for Germany that both an increase in matching efficiency and a reduction in unemployment benefit ratio lead the transfers to increase more than output in percentage terms. Thus, the debt-to-GDP ratio is expected to decline as a result of such reforms.

4.1 "National Reform Programme"

In this subsection, we investigate the potential impact of the National Reform Programme of France by means of our model, where the common parameters of the model are set to the values in Table 1 and the heterogeneous parameters are set to their 2010 values in Table 2. We evaluate the impact of four types of reforms:

1. We increase the consumption tax rate by 1.6 percentage points as has already been done in reality.

2. We increase the consumption tax rate by 1.6 percentage points and decrease the employers' labour tax rate to the extent that the transfers-to-GDP ratio stays constant in the model. In order words, we treat this tax rate as a free parameter, of which lower limit is determined by the budgetary concerns of the government.

3. Since it is hard to have an educated guess on by how much the Public Employment Agency measures can increase the matching efficiency, we use the foregoing German figure of a 20% increase as the upper limit in our experiment and try out more conservative guesses of 10% and 5% as well.

4. We simultaneously increase the consumption tax rate by 1.6 percentage points and the matching efficiency by 5/10/20 % and decrease the employers' labour tax rate to the extent that the transfers-to-GDP ratio stays constant in the model in the same spirit as in the second reform.

While the qualitative effects of an increase in the matching efficiency is very similar to what we have already reported corresponding to the Hartz reforms in Germany, the increase

in the consumption tax rate and the reduction in the employers' labour tax rate bear on the economy through channels that we have not discussed in the paper before. Namely, the consumption tax increase generates a negative demand effect leading to a decline in consumption, output, employment and average hours worked. Hourly wages increase because of the decline in average hours worked and firms hence post less vacancies than in the previous steady state. Yet, the transfers increase following a raise in the consumption tax. The qualitative effect of the increase in employers' tax rate is similar to the effect of a technology shock in an RBC model with search and matching frictions.[30] It has positive effects on both the demand and supply sides of the economy. The only negative effect occurs, however, in government transfers.

The long-run effects of various reform combinations on selected variables of both countries are shown in Table 5. In the upper block of the table, we report if and/or by how much the reform parameters τ^c_{FR}, χ_{FR} and τ^f_{FR} have been changed in each exercise. The results from the first exercise, where we increase the consumption tax rate by 1.6 percentage points to 19.7% and leave the matching efficiency and employers' labour tax rate unchanged, can be seen in column (3) of the table. As mentioned in the previous paragraph, an increase in the consumption tax affects the aggregate demand negatively. However, the quantitative impact of a 1.6 percentage point increase in the consumption tax rate is expected to be small on output and consumption with about 0.3%. The unemployment rate rises slightly by 0.04 percentage points. In contrast, not shown in the table, the transfers increase by almost 4%, leading to a rise in the transfers-to-GDP ratio from 30.5% to 31.8% in our model.

Since the main motivation behind increasing the consumption tax rate is to create room for a reduction in the employers' labour tax rate, the next alternative we explore is to reduce the labour tax rate in the face of a consumption tax increase such that the transfers-to-GDP ratio does not change. Our calculations imply that a 1.6 percentage points increase in the consumption tax allows to reduce the labour tax by 3.0 percentage points, which is done in column (4) of Table 5. It turns out that such a change in the tax system would have small but non-negligible positive effects on the economy. The unemployment rate would decline by 0.45 percentage points and output and consumption would increase by roughly

[30] See Dao (2013a).

Table 5: Reform Possibilities in France

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Reforms	τ^c_{FR}	$\uparrow$ 1.6	$\uparrow$ 1.6	–	–	–	$\uparrow$ 1.6	$\uparrow$ 1.6	$\uparrow$ 1.6
	χ_{FR}	–	–	$\uparrow$ 0.05	$\uparrow$ 0.1	$\uparrow$ 0.2	$\uparrow$ 0.05	$\uparrow$ 0.1	$\uparrow$ 0.2
	τ^f_{FR}	–	$\downarrow$ 3.0	–	–	–	$\downarrow$ 3.1	$\downarrow$ 3.2	$\downarrow$ 3.4
France	Nh	-0.48	0.49	0.30	0.57	1.05	0.83	1.13	1.67
	N	-0.05	0.20	0.49	0.94	1.74	0.70	1.15	1.94
	U	0.04	-0.18	-0.45	-0.85	-1.57	-0.6	-1.04	-1.75
	ϕ	-0.11	0.48	1.20	2.40	4.80	1.73	2.98	5.49
	h	-0.43	0.28	-0.19	-0.37	-0.67	0.13	-0.02	-0.27
	w	0.05	2.28	0.11	0.22	0.41	2.52	2.70	3.06
	Y	-0.44	0.45	0.28	0.52	0.96	0.76	1.04	1.53
	C	-0.36	0.33	0.31	0.59	1.09	0.67	0.97	1.52
	I	-0.36	0.37	0.23	0.43	0.79	0.62	0.85	1.25
	P	0.40	-0.40	-0.25	-0.47	-0.86	-0.68	-0.92	-1.35
Germany	Nh	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
	N	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.02
	U	0.00	-0.01	0.00	-0.01	-0.01	-0.01	-0.01	-0.02
	ϕ	-0.02	0.03	0.02	0.04	0.06	0.05	0.07	0.09
	h	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01
	w	-0.04	0.04	0.03	0.05	0.09	0.07	0.10	0.14
	Y	-0.04	0.05	0.03	0.05	0.10	0.08	0.10	0.15
	C	-0.12	0.13	0.08	0.15	0.27	0.21	0.29	0.43
	I	-0.12	0.13	0.08	0.15	0.27	0.21	0.29	0.43
	P	0.40	-0.40	-0.25	-0.47	-0.86	-0.68	-0.92	-1.35

Notes: The table shows the long-run percentage change in selected variables after a variety of reform combinations listed in each column of the upper block. Percentage point change is shown for consumption tax τ^c_{FR}, employers' labour tax τ^f_{FR}, unemployment rate U and job finding probability ϕ; percentage change for all remaining variables. $\uparrow, \downarrow$ and $-$ show an increase, decrease or no-change in the corresponding reform parameter, respectively.

0.3%. Obviously, increasing the consumption tax rate by more would provide the French government also a larger room for decreasing the labour tax and thus boost output and employment.

In the next three policy reform exercises, of which results are given in columns (5)-(7) of Table 5, we increase the matching efficiency by 5%, 10% and 20%, respectively, while leaving the consumption and employers' labour tax rates as in 2010 in France. The quantitative results corresponding to a 20% increase in the matching efficiency of France are very similar to what we have reported before for Germany in Figure 1 and Table 3. This is not surprising, since most of the parameters of the two countries are set identically in our framework. Most importantly for our forthcoming exercise, the increase in the matching efficiency, say, of 20% leads to an increase in transfers of 1.63% which is, however, accompanied by a 0.96% increase in output as well. Therefore, the improvement in the transfers-to-output ratio to merely 30.7% from 30.5% is rather limited. If the matching efficiency increases only by 5%, the share of transfers in output remains constant in effect.

In our last group of quantitative exercises in this subsection, we increase the consumption tax rate by 1.6 percentage points and the matching efficiency by either 5%, 10% or 20%, and decrease the employers' labour tax rate for each of these possibilities by so much that the steady state transfers-to-output ratio stays at the same level as before the reforms. This implies decreasing the labour tax rate by 3.1, 3.2 or 3.4 percentage points, depending on whether the increase in the matching efficiency is 5%, 10% or 20%, respectively. For our benchmark calibration, the expected increase in output and consumption is between 0.7% and 1.5%, accompanied by a decline in the unemployment rate of 0.63–1.75 percentage points.

4.2 Alternative Scenarios

In the section on German Hartz reforms, we have seen that a decline in unemployment benefit ratio might also lead to a significant improvement of government finances together with positive employment and output effects. Notwithstanding the potential political difficulties for such a reform, we first consider the impact of a decline in the unemployment

benefit ratio of France by an amount of 4 percentage points in the following. We start out with the impact of such a change in policy alone, of which results are shown in the third column of Table 6. Not surprisingly, the results are qualitatively the same as in our analysis of the German Hartz reforms. A decline in the 2010 unemployment benefit level by 4 percentage points vis-à-vis the initial 2010 level brings a 0.67 percentage points decline in the unemployment rate, accompanied by further positive effects on output, consumption and total hours worked.

In the columns (4) and (5) of the table, we carry out four reforms simultaneously: a decline of 1.6 percentage points in the consumption tax, an increase in the matching efficiency of either 0.05 or 0.2 percent, a decline in the unemployment benefit level ratio of 4 percentage points and a reduction in the employers' labour tax rate so high that the transfers-to-output ratio stays constant. The aim is here to see by how much the inclusion of the unemployment benefit reduction in the reform package facilitates a further reduction of the employers' labour tax rate and thus a yet lower unemployment rate than in our previous exercise of trivariate simultaneous reforms. A matching efficiency improvement of 0.05 (0.2) implies thus a reduction in the employers' labour tax rate of 3.4 (3.7) percentage points. These alternative scenarios lead to even more favourable outcomes than the joint trivariate reforms without the reduction in the unemployment benefit ratio, of which results were listed in columns (8)–(10) of Table 5. The government-budget-neutral range of unemployment rate improvement, when the unemployment benefit ratio is decreased by 4 percentage points, lies between 1.25 and 2.29 percentage points depending on by how much the matching efficiency increases as a result of the reforms.

Finally, in the last four columns of Table 6, we investigate the long-run quantitative effects of the triple (in columns (6)–(7)) and quadruple (in columns (8)–(9)) reform packages if the parameter ϵ determining bargaining power of firms in the Nash bargaining is reduced from 0.5 to 0.4 and accordingly the vacancy elasticity parameter ψ in the hiring function as well. As we have seen in Table 4 above, the reduction in the bargaining power of firms implies relatively less pronounced, but still significant, effects of reform packages. The range of decline in the unemployment rate after the quadruple reform package lies for instance between 0.89 and 1.97 percentage points.

Table 6: Alternative Reform Possibilities in France

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Reforms	τ^c_{FR}	–	↑ 1.6	↑ 1.6	↑ 1.6	↑ 1.6	↑ 1.6	↑ 1.6
	χ_{FR}	–	↑ 0.05	↑ 0.2	↑ 0.05	↑ 0.2	↑ 0.05	↑ 0.2
	τ^f_{FR}	–	↓ 3.4	↓ 3.7	↓ 3.1	↓ 3.4	↓ 3.1	↓ 3.4
	b_{FR}	↓ 4.0	↓ 4.0	↓ 4.0	–	–	↓ 4.0	↓ 4.0
	ψ, ϵ	–	–	–	↓ 0.1	↓ 0.1	↓ 0.1	↓ 0.1
France	Nh	0.55	1.42	2.18	0.76	1.59	1.15	1.94
	N	0.75	1.38	2.54	0.60	1.83	0.99	2.18
	U	-0.67	-1.25	-2.29	-0.54	-1.65	-0.89	-1.97
	ϕ	1.86	3.67	7.71	1.46	5.12	2.52	6.33
	h	-0.19	0.04	-0.35	0.17	-0.23	0.16	-0.24
	w	-0.33	2.43	2.99	2.55	3.07	2.53	3.07
	Y	0.51	1.30	2.00	0.70	1.46	1.05	1.77
	C	0.24	0.94	1.76	0.63	1.46	0.78	1.60
	I	0.42	1.06	1.63	0.57	1.19	0.86	1.45
	P	-0.45	-1.15	-1.76	-0.62	-1.30	-0.94	-1.57
Germany	Nh	0.00	0.01	0.02	0.00	0.01	0.01	0.01
	N	0.01	0.02	0.03	0.01	0.01	0.01	0.02
	U	-0.01	-0.02	-0.02	-0.01	-0.01	-0.01	-0.02
	ϕ	0.03	0.08	0.12	0.03	0.06	0.05	0.08
	h	0.00	-0.01	-0.01	0.00	-0.01	0.00	-0.01
	w	0.05	0.12	0.19	0.07	0.14	0.10	0.17
	Y	0.05	0.13	0.20	0.07	0.14	0.10	0.17
	C	0.14	0.36	0.56	0.19	0.41	0.29	0.49
	I	0.14	0.36	0.56	0.19	0.40	0.29	0.49
	P	-0.45	-1.15	-1.76	-0.62	-1.30	-0.94	-1.57

Notes: The table shows the long-run change in selected variables after a variety of reform combinations listed in each column of the upper block. Percentage point change is shown for consumption tax τ^c_{FR}, employers' labour tax τ^f_{FR}, unemployment rate U and job finding probability ϕ; percentage change for all remaining variables. $\uparrow, \downarrow$ and $-$ show an increase, decrease or no-change in the corresponding reform parameter, respectively.

4.3 Further Discussion and Remarks

Through similar channels as in the case of German Hartz reforms, the French reforms could have positive spillover effects on the "German " economy as shown in the lower panels of Tables 5 and 6. Yet, those effects are somewhat lower than the spillover effects on the "French " economy of the German Hartz reforms reported in the previous section. This can be explained by the relatively stronger starting position of the "German " economy when the French economy starts reforms than the starting position of the "French " economy as the Hartz reforms were introduced.

Note that we have considered budget-neutral reform possibilities for France in this section. Alternatively, it is possible to follow less generous reforms in the labour market with the objective to decrease the government debt. The figures that we provide with respect to long-run effects might also be more favourable in reality when there are improvements in the total productivity level giving even more room to the government, e.g., to decrease the employers' tax rate or decrease its debt. While the extent of reforms that can be introduced in France is open to discussion, our results suggest that several combinations of policy parameters exist to improve the macroeconomic performance through labour market reforms.

5 Conclusion

The still ongoing effects of the 2008-2009 global recession and the slow adjustment in its aftermath, accompanied by monetary and fiscal policies that have already reached their limits as growth stimulator, have put structural reforms on top of the reform agenda of policy makers in many countries. Thereby, labour market reforms feature a high priority, particularly in the European Union where unemployment rates reached a high level in most member economies. In this context, the perceived conspicuous success of the German labour market reforms of 2003-2005 seems exemplary. In the current paper, our goal has been to investigate the (potential) impact of various reform options both nationally and in terms of international spillovers. We chose a two-country DSGE model with labour market frictions as our laboratory to this end.

Since our focus has been on European economies, which are known to have more rigid labour markets in comparison to Anglo-Saxon countries, the calibration of the two economies in our model has been with respect to France and Germany. The choice of these countries was by no means random, but followed from a few observations. First, they are the largest two economies of the euro area and their economic health (or sickness) impacts beyond their borders. Second, Germany impressed other countries with its performance after the introduction of its labour market reforms, whereas France has increasingly been said to be in need of reforms. Third, both economies are intertwined with each other as well as the rest of the euro area and the world. All of these three factors made these two countries good candidates for our analysis.

For our quantitative analysis, we calibrated most of the parameters of both countries to identical values in order to place our focus on a few labour-market-related institutions which have been set heterogeneously. In particular, we carried out our quantitative analysis in two steps. First, we calibrated the heterogeneous parameters relating to the unemployment rate, the job finding probability, the unemployment benefit ratio as well as the consumption and labour taxes to their values in 2003 for both countries. This allowed us to examine whether our model as such was able to reflect the developments in the German economy to a large extent. This was indeed the case. We found that allowing for an efficiency increase in the matching between firms and unemployed workers and a substantial decline in the unemployment benefit ratio, as it took place in the data, might explain the difference between several macroeconomic quantities of Germany over the period 2003 to 2010 rather well.

Second, encouraged by the quantitative success of the model from our initial experiment, we investigated the reform possibilities for the French economy in the light of what has already been brought into action and/or is being planned by the French government since 2012. When considering several reform possibilities for France, we paid particular attention to having constellations with either no extra burden for the government budget or even budget-improving qualifications. Our findings show that increasing matching efficiency through similar measures as in Germany and increasing the consumption tax in order to create room for reducing employers' social security contributions might have significant positive

effects on the overall macroeconomic performance in general and the unemployment rate in specific.

Several sensitivity analyses and other potential reform constellations where the unemployment benefit ratio is also decreased in order to create even more room for decreasing employers' social security contributions suggest that the range of decline in the French unemployment ratio due to reforms might lie between 0.5 and 2.3 percentage points, depending on how effective the measures for increasing the matching efficiency will be. The positive long-run output effects of potential labour market reforms lie between 0.8 and 2.0 percent.

As to the spillover effects of reforms, we found them to be positive, yet much smaller than in the reforming country. The positive spillovers, particularly on consumption and output, follow from the existence of frictions in the labour market and materialise through a deterioration in the terms of trade of the reforming country and accompanying capital flows to the reforming country. Thus, our framework does not imply beggar-thy-neighbour effects of reforming countries on their trading partners. Moreover, recent literature shows that the spillover effects we obtain might get much stronger if we included real wage rigidities in the model as well.

It should be noted that the quantitative predictions that we provide are only suggestive figures. The positive effects could be even larger if technological improvement had also been taken into account in our quantitative experiments. Moreover, the model does not include government debt or financial markets. The macroeconomic improvement following from labour market reforms might also lead to more favourable effects through this channel. The government might use some proceeds from the labour market reforms to decrease its debt and thus the macroeconomic uncertainty. Positive budget effects accompanied by a favourable macroeconomic environment could lead to larger effects than we estimated due to the financial accelerator channel as well. We thus see our quantitative exercise as providing a lower bound on the potential positive long-run effects of reforms and leave the investigation of the latter channels to future work.

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A Optimization of the foreign country

A.1 Foreign Households

Similar to its domestic counterpart, the representative foreign household maximizes its expected life-time utility

$$E_0 \sum_{t=0}^{\infty} \beta^t \left[N_{2t} U(C_{2t}^n, h_{2t}) + (1 - N_{2t}) U(C_{2t}^u) \right] \tag{36}$$

where the functional form of the per-period utility is the same as for country 1 (see Equations (2) and (3)). Foreign households' optimization is subject to the budget constraint (in terms of the good produced in the domestic economy)

$$\begin{aligned} P_{2t}^c \left(1 + \tau_2^c\right) C_{2t}^c + B_{2t+1} + P_{2t}^c CA_{2t} = \\ = P_t N_{2t} w_{2t} h_{2t} \left(1 - \tau_2^d\right) + \left(1 - N_{2t}\right) P_t b_{2t} + B_{2t} \left(1 + i_t\right) + T_{2t} + P_t \Pi_{2t}^F \end{aligned} \tag{37}$$

and to the law of motion of employment symmetric to equation (7). In addition foreign bond holders face the same portfolio adjustment costs as domestic bond holders.

The first order conditions for this optimization problem are given by

$$\frac{1}{C_{2t}^c} = \left(1 + \tau_2^c\right) \lambda_{2t} P_{2t}^c \tag{38}$$

$$1 + \Phi_b \frac{B_{2t+1}}{P_{2t}^c} = \beta E_t \left[\frac{\lambda_{2t+1}}{\lambda_{2t}} \left(1 + i_{t+1}\right) \right] \tag{39}$$

The preferences of foreign households regarding the composition of the final consumption bundle resemble the domestic one and can be written as

$$C_{2t}^c = \left[\kappa^{\frac{1}{\eta}} C_{2t}^{* \frac{\eta-1}{\eta}} + (1 - \kappa)^{\frac{1}{\eta}} C_{1t}^{* \frac{\eta-1}{\eta}} \right]^{\frac{\eta}{\eta-1}} \tag{40}$$

By minimizing the costs for C^c_{2t} the following foreign demand functions are obtained:

$$C^*_{2t} = \kappa \left(\frac{P_t}{P^c_{2t}} \right)^{-\eta} C^c_{2t} \tag{41}$$

$$C^*_{1t} = (1-\kappa) \left(\frac{1}{P^c_{2t}} \right)^{-\eta} C^c_{2t} \tag{42}$$

A.2 Foreign Firms

Foreign firms face the same production technology, capital adjustment costs and law of motion for capital and employment as domestic firms when maximizing their profits given by

$$\Pi^F_{2t} = P_t Y_{2t} - P_t w_{2t} h_{2t} N_{2t} \left(1 + \tau^f_2\right) - \omega_2 P^c_{2t} V_{2t} - P^c_{2t} I^c_{2t} - P^c_{2t} C I_{2t} \tag{43}$$

with respect to capital, labour and vacancies. The resulting optimality conditions read as

$$q^T_{2t} = \beta E_t \left[\frac{P^c_{2t+1}\lambda_{2t+1}}{P^c_{2t}\lambda_{2t}} \left\{ \frac{P_{t+1}}{P^c_{2t+1}} \alpha \frac{Y_{2t+1}}{K_{2t+1}} + q^T_{2t+1} - \delta + \frac{\Phi_I}{2} \left(\frac{I_{2t+1} - \delta K_{2t+1}}{K_{2t+1}} \right)^2 \right\} \right] \tag{44}$$

$$\frac{\omega_2}{q_{2t}} = \beta E_t \left[\frac{P^c_{2t+1}\lambda_{2t+1}}{P^c_{2t}\lambda_{2t}} \left\{ \frac{P_{t+1}}{P^c_{2t+1}} (1-\alpha) \frac{Y_{2t+1}}{N_{2t+1}} - \frac{P_{t+1}}{P^c_{2t+1}} w_{2t+1} h_{2t+1} \left(1 + \tau^f_2\right) + (1-s_2) \frac{\omega_2}{q_{2t+1}} \right\} \right] \tag{45}$$

where q^T_{2t} is Tobin's q and defined as in equation (22).

A.3 Matching and Bargaining in the Foreign Labour Market

The matching and bargaining process follow exactly the same rules as in the domestic labour market (see equations (23) and (24)). The labour contract defining the optimal level of wages and hours worked should satisfy the following first order conditions:

$$\frac{\kappa^n_2}{\lambda_{2t}} (1 - h_{2t})^{-\xi} = \frac{1 - \tau^d_2}{1 + \tau^f_2} P_t (1-\alpha) \frac{Y_{2t}}{N_{2t} h_{2t}} \tag{46}$$

$$w_{2t}h_{2t} = \frac{1-\epsilon}{1+\tau_2^f}\left[\omega_2 \frac{P_{2t}^c}{P_t}\theta_{2t} + (1-\alpha)\frac{Y_{2t}}{N_{2t}}\right] + \frac{\epsilon}{1-\tau_2^d}\left[b_{2t} + \frac{1}{P_t\lambda_{2t}}\left(\kappa_2^u - \kappa_2^n \frac{(1-h_{2t})^{1-\xi}}{1-\xi}\right)\right] \tag{47}$$

B Tax data

Employers tax rate τ^f Employers tax rate is calculated by employers' social security contribution (ESS) divided by the difference between total compensation for employees and ESS. Data on the ESS stem from the OECD Revenue Statistics, total compensation for employees is taken from the OECD National Accounts detailed tables.

Employees tax rate τ^d Employees tax rate equals the sum of income tax and employees' social security contributions divided by household current receipts. The latter are composed by the sum of compensation of employees, property income, social contributions and benefits, other current transfers taken from the OECD National Accounts as well as data income tax. Employees' social security contributions stem from the OECD Revenue Statistics. Our source on income tax differs from Nickell (2006), since the OECD Revenue Statistics stopped to provide this time series. Apparently, income tax statistics used by Nickell must have been higher than the one reported by the OECD National Accounts. In consequence, our computed tax rates are around three to five percentage points higher. But they lie in the range of average income tax rates by type of household from the OECD Revenue Statistics.

Consumption tax rate τ^c Consumption tax rate consists of the difference between indirect taxes (taxes on production and imports) and subsidies divided by household final (consumption) expenditures. All components stem from the OECD National Accounts as suggested by Nickell. Nevertheless, there has been some change in calculation of the aggregates leading to consumption taxes rates which are about five percentage below those computed by Nickell (2006).

Our differences in employees and consumption tax to the Nickell data lead to a difference in the average tax wedge of about 10 percentage points. But our average tax wedge lies in

the range of wedges by household type reported by the OECD National Accounts whereas Nickell's does not. Furthermore, since the differences to the Nickell data are consistent between countries they have no consequence on the comparison of reform effects between countries. Of course, they imply symmetric quantitative changes in the responses of countries to reforms.

Labour market performance in OECD countries: A comprehensive empirical modelling approach of institutional interdependencies

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Labour market performance in OECD countries: A comprehensive empirical modelling approach of institutional interdependencies*

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Abstract

Reducing institutional rigidities in product and labour markets is key to lowering unemployment. The impact of such labour and product market reforms, however, depends crucially on the country-specific regulatory framework. In this paper, we estimate the country-specific impact of changes in six categories of institutional regulation conditional on the country-specific regulatory environment for a dynamic panel of 26 OECD countries. We overcome existing problems of modelling a large set of institutional interdependencies by applying a model selection approach which is innovative within this literature. In doing so, we provide evidence for the existence of higher-order institutional interdependencies. We further document that especially for changes in employment protection and the unemployment benefit system the impact on unemployment is mixed across countries, thus questioning the relevance of best-practice policies.

JEL *classification: C33, E02, E24*
Keywords: Labour market institution, institutional interdependencies, model selection, heuristic optimization

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1 Introduction

The recent economic crisis has resulted in a dramatic deterioration of economic growth and labour market performance in various industrialized countries. There is a widespread view that economies under pressure associated with high unemployment or low employment rates need to change their institutional environment. This needs to happen by conducting structural labour market reforms in order to improve labour market performance by, for instance, facilitating job reallocation processes or increasing labour market flexibility. Despite extensive theoretical and empirical contributions about the link between labour market institutions and labour market performance, evidence on the impact of labour market rigidities on labour market performance which take the country specific institutional framework and potential institutional interactions into account is still scarce.

Theoretical and empirical evidence suggests that an institutional reform which is successful in one country might not be equally successful in another economy.[1] An explanation could be that institutions do not work in isolation. This is in line with the rising doubt of best practice solutions across EU member states. The impact of a reform which changes the level of an institutional rigidity is likely to depend on the entire institutional environment. The Danish flexicurity system is a good example. Andersen and Svarer (2007) point out that the relatively low unemployment rate in Denmark since mid-1990 is due to a labour market reform which complements pre-existing low employment protection and high replacement rates with a newly introduced active labour market policy. Caused by this reform, labour is allocated more efficiently through the combination of low employment protection, a suitable safety net (high replacement rates) and adequate activation measures to avoid the loss of job-specific networks and human capital.

According to this, labour market institutions have to be matched to each other to work well. While reducing employment protection is likely to result in lower unemployment in countries characterized by a generous unemployment benefit system and pronounced active labour market policies, the reform could have no or even a contradictory effect in countries with low unemployment benefit levels and/or less efforts to bring people back to work. This example again highlights the importance of interdependent institutional effects on a country's labour market performance.

The implementation of a European semester of policy coordination by the European Union indicates that the issue of country-specific institutional settings is highly relevant from a policy perspective. The European Semester is an EU-level policy coordination tool which serves to ensure that EU members reach the goals of the Europe 2020 Strategy by boosting growth and employment in order to initiate convergence in competitiveness in Europe. The recent economic

[1] See Coe and Snower (1997) and Belot and van Ours (2004) for a theoretical treatment, and Bassanini and Duval (2009) and Sachs (2011) for an empirical investigation of this topic.

crisis led some EU member countries losing track of these goals. Increasing unemployment rates, growing budget deficits and low GDP growth rates provoke the need for substantial labour market adjustments in these countries to both improve labour market performance and to reduce the governmental financial burden for the social security system, which are both essential for improving competitiveness. However, the implementation of required adjustments is often prevented by missing political support or lack of knowledge of which adjustments to perform. The EU tries to overcome these problems by providing supranational policy guidance which includes recommendations for institutional adjustments in the labour market.

Such recommendations for country-specific institutional adjustments should have a sound and reliable scientific basis in order to avoid futile or even detrimental institutional effects, and to facilitate coordination from the perspective of the European Union. Microeconomic studies are well-suited to provide evidence on institutional effects for specific groups of workers or firms. However, such studies do not calculate aggregate institutional effects, that is, for the whole economy. In contrast, macroeconomic approaches are able to do so. So far, most empirical macroeconomic studies do not adequately take interdependencies between institutions into account but focus on isolated institutional effects or on few subjectively selected interdependencies, instead. Theoretical contributions either focus on a single specific interdependency or deal with a broad but imprecise characterization of interactions. Such limited theoretical guidance for empirical model specification in combination with an insufficient number of observations is the main reason for many studies disregarding institutional interactions from a macroeconomic perspective.

This paper aims at closing this gap by introducing model selection methods which are innovative within this literature, namely heuristic optimization procedures, in order to comprehensively take the impact of institutional interdependencies on labour market performance into account. To be specific, we follow the general theoretical model of Belot and van Ours (2004) in order to select institutional factors which are expected to have (interdependent) effects on the labour market. We then specify a dynamic empirical panel model for 26 OECD countries which explains unemployment, our preferred measure of labour market performance, by institutions, interdependencies between institutions, and a set of control factors. This model can then be used as a basis for the identification of institutional effects on unemployment. There are two main advantages of this approach over the previous literature. First, the potential impact of an institutional adjustment on the labour market can be evaluated depending on the country-specific institutional parameterization. Second, it allows for higher-order interactions without restricting the model space on subjective grounds.

The results suggest that there are substantial differences across countries in the labour market impact of institutional changes for nearly all selected institutional indicators. Hence, the impact of a reform of employment protection, unemployment benefits, labour taxes, bargaining power, and bargaining coordination crucially depends on the country-specific institutional set-

ting. Furthermore, the findings are of considerable importance for the theoretical literature. We provide evidence for the existence of higher-order institutional interdependencies. We further document that especially for changes in employment protection and the unemployment benefit system the impact on unemployment is mixed across countries, thus questioning the relevance of best-practice policies.

The paper is organized as follows. Chapter 2 provides an overview of existing approaches to theoretically identify and empirically estimate labour market effects of interdependent labour market institutions. Chapter 3 deals with the empirical model specification employed in this paper while chapter 4 introduces the corresponding model selection techniques. Data issues are described in chapter 5, results of the model selection approach are presented in chapter 6, and chapter 7 concludes.

2 Literature review

Over the last twenty years, a plethora of empirical contributions sought to identify the direct impact of institutions on unemployment or employment rates. Earlier studies come to the conclusion that rigid labour markets through, for instance, high employment protection or generous unemployment benefit systems are responsible for weak labour market performance.[2] More recent studies benefit a lot from developments in data quality and estimation methods which improved the reliability of the results and questioned the orthodox view that rigid institutions lead to undesirable labour market outcomes.[3]

Yet, the aforementioned studies ignore the institutional environment, hence, the country-specific institutional set-up, of a country as a whole. As Belot and van Ours (2004) and Coe and Snower (1997) argue, the same institutional reform need not necessarily have the same labour market impact in different countries. A reform might have a different impact depending on other country-specific institutional aspects. This idea of institutional interdependencies has been taken up in some empirical studies differing in terms of which interdependencies are included. Belot and van Ours (2004) specify a model explaining unemployment which considers three interactions - between labour taxes and unemployment benefits, employment protection and bargaining centralization, and union density and bargaining centralization. The findings indicate that institutional interactions are relevant for explaining unemployment in OECD countries. Similar empirical approaches, albeit with a different and limited sets of bivariate interactions, are chosen by Nickell et al. (2005) and Baccaro and Rei (2007). Bassanini and Duval (2009) apply a more comprehensive approach. They emphasize that subjectively selecting some interactions can result in considerably biased estimates due to an omitted variable bias caused

[2]See, inter alia, OECD (1994), Scarpetta (1996), Elmeskov et al. (1998), Blanchard and Wolfers (2000), IMF (2003).

[3]See Howell et al. (2007), Baccaro and Rei (2007), Bassanini and Duval (2009) and Sachs (2012).

by the exclusion of further potentially relevant interactions. By estimating all possible bivariate interactions between six institutional factors jointly, and by further applying an instrumental variable estimator, they take an important step forward by reducing the risk of an omitted variable bias. Although almost no interaction appears relevant, the authors emphasize that the findings do not imply that interactions are irrelevant, but that a small sample size might prevent more precise estimates. The problem of being faced with an insufficient number of observations is tackled in Sachs (2011) by the application of a Bayesian model averaging approach. Bivariate interactions between 14 institutional indicators are constructed and their impact on unemployment is estimated in a static model set-up. The model averaging approach enables the robust estimation despite a limited number of observations and a potentially large set of relevant explanatory factors. The outcomes highlight the importance of institutional interdependencies for a country's labour market performance in the long-run. 22 bivariate interaction terms are robustly linked to unemployment, and nearly all considered institutional indicators turn out to be relevant interaction partners. However, neither higher-order interactions nor a dynamic specification are considered in that contribution.

Instead of constructing interaction terms between individual institutions, Bassanini and Duval (2009) further analyse the interaction between a particular institution and the country-specific institutional framework as a whole. This is done by estimating a specification where the latter is defined by the sum of direct unemployment effects of institutions. Indeed, results produced with such a model suggest that the impact of an institutional change on unemployment depends on the aggregate institutional setting. The less rigid the overall institutional framework, the more successful are deregulating institutional reforms. According to this, institutions seem to be complementary, i.e. jointly reducing regulation is successful; a hypothesis which is also advanced by Coe and Snower (1997). While this approach is clearly appealing it suffers from combining already highly aggregated individual institutional indicators even further to an indicator of a country's institutional setting. If there is considerable heterogeneity in institutions, this method might neglect relevant institutional information. Furthermore, Sachs (2011) does not find a general tendency towards complementary institutions. Therefore, we see the approach of Bassanini and Duval (2009) as a first step we can build on by applying a more structural approach.

While both aforementioned studies take a large set of bivariate interactions into account, higher-order interactions are completely neglected. Recalling the example of the successful Danish flexicurity system such higher-order interactions between more than two institutions can be highly relevant and existing empirical models including merely bivariate interactions might provide misleading evidence. But higher-order interactions also matter from a technical point of view. According to Braumoeller (2004), once a model with two interactions X_1X_2 and X_2X_3 is specified, the interactions between X_2X_3 and $X_1X_2X_3$ must be taken into account, as well.[4]

[4]In this case, X_1 and X_2 are called the constitutive terms of the interaction term X_1X_2.

Neglecting the trivariate interaction term is equivalent to assuming that the coefficients of the bivariate interaction terms X_1X_2 and X_2X_3 measure the impact on unemployment given that the third variable is zero. Hence, X_1X_2 gives the impact of X_1 on unemployment conditional on the level of X_2 and given that $X_3 = 0$. If this assumption does not hold and the trivariate interaction is a significant explanatory factor, estimates are biased. It is therefore necessary to additionally include $X_1X_2X_3$ irrespective of its economic relevance but for pure technical reasons.

3 Empirical Model Specification

Our study seeks to first identify relevant institutional interactions for a given set of institutional factors and second to determine the country-specific marginal effects of institutional changes on the labour market by taking the country-specific institutional environment into account. The model selection approach applied in this study is used to generate reliable empirical results despite limited theoretical guidance. Yet, some theoretical considerations are necessary to define the set of potentially interacting institutions. To do so, the right-to-manage model of Belot and van Ours (2004) is taken as the theoretical basis for the following empirical exercise. In this model, the unemployment benefit system, the labour tax system, employment protection, bargaining coordination, union bargaining power, and product market regulation can theoretically have an interdependent impact in the labour market by affecting the levels and the elasticities of labour supply and demand. More precisely, the labour market impact of a reform that changes the level and/or the elasticity of labour supply depend on the level and the elasticity of labour demand and vice versa. Hence, the labour market effect of a change of an institution can depend on one or more other institutions. Overall, considering the six institutional factors of Belot and van Ours (2004) adds up to a set of 63 variables (six individual institutional indicators plus 57 bivariate and higher-order interaction terms) which might be relevant explanatory factors.

Most econometric studies focusing on the link between labour market performance and institutions use static models. More recently, dynamic models gained importance in this literature. While Fiori et al. (2012) promote a dynamic specification on the grounds of a missing cointegrating relationship between unemployment and institutions; we use a dynamic model for the following reason. The main goal of this paper is to provide an empirical basis for recommendations in terms of institutional adjustments. As pointed out by Nickell et al. (2005) unemployment is probably exposed to some degree of endogenous persistence. This means that explanatory factors might have an influence on unemployment which lasts longer than one year. A static model would not be able to adequately capture this kind of influence and reform recommendations would be inadequate.

Accordingly, the model explaining labour market performance reads

$$Y = X\beta + Z\theta + C\gamma + U. \tag{1}$$

The dependent variable Y is given by the unemployment rate and is a vector of size $NT \times 1$, X is a $NT \times K$ matrix containing institutional factors as well as the lagged dependent variable, Z is a $NT \times G$ matrix of bivariate and higher-order interactions between the six variables describing specific institutional settings, C is a $NT \times L$ matrix of control variables, and β, θ and γ are the corresponding coefficient vectors of the explanatory variables.

The inclusion of the lagged dependent variable entails that the persistence of the unemployment rate can be adequately captured. However, marginal institutional effects now can only explain a short-term movement of the unemployment rate, since long-term adjustments are captured by the lagged dependent variable. This approach is sometimes criticized for leaving very little variation over time to the explanatory variables. In other words, a large part of the variation in unemployment is explained by lagged unemployment. If one is explicitly interested in the long-term effects of institutions in unemployment, it could be preferable to specify a static model. If one, however, is interested in finding a model which explains short-term movements in unemployment properly, a dynamic specification is preferable. The same rationale serves for taking time- and country-specific fixed effects into account. Accordingly, the error term is specified as

$$u_{i,t} = \alpha_i + \lambda_t + \nu_{i,t}. \tag{2}$$

Here, α_i is the country-specific effect which captures time-invariant unobservable determinants of unemployment. Such unobservables could comprise of cultural or social differences across countries like the attitude to work. λ_t is the time-specific effect which takes global events affecting all countries equally into account. An example for this might be a global recession which impacts on the labour markets of all countries.

Estimating a dynamic two-way error component panel data model with fixed effects can deliver biased and inconsistent estimates since the lagged dependent variable is correlated with α_i which is part of the error term (see Baltagi (2003)). Especially for a short time-series, the error could be large. A solution to this is the application of the Arellano and Bond (1991) difference GMM estimator. This estimator transforms the model in differences and uses lagged levels of the dependent variable as instruments. While this estimator performs well when the instruments are appropriate, it is biased for weak instruments. Thus, Blundell and Bond (1998) suggested additional moment restrictions by setting up a system GMM estimator. Here, the system consists of the model equation in differences with lagged levels as instruments, and the model equation in levels with lagged differences as instruments. This estimator is theoretically particularly suitable for persistent dependent variables as it is in our set-up. However, while

the system GMM estimator is theoretically superior to a fixed effects estimator, the practical implementation is often hampered by the invalidity of the instrument matrix for both the difference and the level equation, especially when the country- and time dimensions are small and the time series are persistent (see Bun and Windmeijer (2010)). Hence, we first apply a simple fixed effects estimator and subsequently check the findings by applying the model selection method to the system GMM estimator. For the fixed effects estimator, we perform a recently developed LM-test for serial correlation which is especially adequate for panels with small T (Born and Breitung, 2013). A penalty is added to the target function of a specific model if serial correlation is detected. In doing so, we avoid to select models which are mis-specified indicated by serially correlated error terms.

Validation of the system GMM estimator requires the verification of the following three assumptions: validity of the instruments, covariance-stationarity of the endogenous variable, and no second order serial correlation in the residuals. The first assumption is tested by the Sargan test of overidentifying restrictions. The second assumption implies that the coefficient of the lagged dependent variable should converge to a steady-state and consequently be smaller than unity (Roodman, 2009). This can be tested with a Difference Sargan test of the full instrument set against the instrument set of the first-differenced GMM estimator (Blundell and Bond, 2000). Finally, there should be no second order serial correlation in the residuals. This assumption can be tested with the Arellano-Bond serial correlation test (Arellano and Bond, 1991).[5] In principle, each of the three tests should be applied to each panel model that is estimated by system GMM.

4 Selecting interactions using heuristic optimization techniques

4.1 Optimization Problem

As theory offers no explicit guidance which kind of institutional interdependencies are crucial for the well-functioning of the labour market, we seek to identify relevant institutional interactions empirically. This should provide useful insights for theoretical model-builders to incorporate institutions and their interactions. Besides the ambiguity of the theory, a key methodological problem in model selection within a multiple regression model when the relevant variables are not known a priori is the trade-off between consistency and efficiency. Taking a large number

[5]For the sake of an efficient estimation one can apply the second-step weighting matrix which is based on the residuals of the first-step estimation. In this case the Sargan test can be replaced by the Hansen J test which is robust to heteroscedasticity but vulnerable to instrument proliferation (Roodman, 2009). In this case, Roodman suggests a "collapsing" of the instrument matrix. Here we report first-step estimates, since the second-step weighting matrix seems to be poorly estimated because of weakly changing regressors, resulting into unstable second-step estimates.

of regressors into account increases the variance, whereas including too few variables leads to inconsistent estimates. In our application, allowing for all possible interactions of $K = 6$ institutional variables leaves us with 2^{57} models to be estimated including the individual, non-interacting variables as well as the control factors. It becomes infeasible to estimate all potential combinations even when efficient methods are used (Gatu et al., 2008). Being faced with this problem, there exist several approaches for finding an efficient way to obtain an optimal outcome by estimating only a subset of all potential models within the model selection literature.

Following the (standard) model selection techniques of Leamer (1983) and Sala-I-Martin (1997), Fernandez et al. (2001) propose Bayesian Model Averaging as a new model selection technique. In general, these model averaging approaches are used to identify robust and significant explanatory variables from a large set of potentially relevant explanatory factors. Thus, model averaging approaches are linked to model selection by providing a rationale for selecting the set of explanatory factors. This method uses inclusion probabilities of individual variables to approach the true model.[6] Alternatively, Krolzig and Hendry (2001) and Hoover and Perez (2004) suggest a general-to-specific approach based on statistical tests belonging to the frequentist strand. Hendry and Krolzig (2004) provide a programme PcGets for model selection purposes which relies on a general-to-specific procedure and searches along multiple paths. Perez-Amaral et al. (2003) provide another type of model selection tool - a network approach - called RETINA. In our study, we focus on optimization methods which efficiently and objectively search through the model space in order to avoid sequential procedures in which subjective elements prevail. In particular, we apply heuristic optimization techniques as advocated by e.g. Savin and Winker (2012), Acosta-González and Fernández-Rodríguez (2007) and Kapetanios (2007). These are able to deal with non-smooth, discrete optimization problems.

Recently, Acosta-González and Fernández-Rodríguez (2007), Kapetanios (2007) and Savin and Winker (2012) have shown that heuristic optimization techniques based on information criteria as objective function deliver promising results in selecting regressors in different model selection set-ups of multiple regression models.[7] Kapetanios (2007) documents an outperformance of Simulated Annealing (SA) and Genetic Algorithms (GA) as two classical heuristic methods over PcGets. The closest to our approach is the model selection set-up by Savin and Winker (2012) who apply heuristics to a (dynamic) panel model and identify a genetic algorithm as being the best model selection strategy for this type of model. Hence, we apply a genetic algorithm to select relevant institutional interactions.

An alternative approach to deal with too many potential regressors is using factor augmented regressions (see, for instance, Bai and Ng (2006)). However, for our application, linear

[6] We do not pursue a Bayesian model selection approach which strongly relies on postulation of priors. In our application, we do not have any theoretical guidance for the prior specification of the interaction terms. Second, Kapetanios (2007) shows that heuristic optimization methods, particularly simulated annealing, are preferable over the MC^3 algorithm used by the Bayesian approach.

[7] Winker (1995, 2000) and Winker and Maringer (2006) already applied heuristic methods for lag selection to overcome the curse of dimensionality within multivariate VAR models.

factors might not be adequate, as they could hardly cover the higher order effects we are interested in. Moreover, the variables representing institutions are not highly correlated (see Appendix table 6) and hence, we might lose information by aggregating the data even further.

4.2 Model selection technique

Let us consider our empirical model explaining unemployment:

$$Y = X\delta + Z^{cand}\varphi\theta + C\gamma + U \tag{3}$$

where Z^{cand} denotes all candidate regression variables, that is all interactions up to order six. φ is a $G \times G$ matrix of zero and ones on the diagonal, depending on which interactions are selected. As a constraint the levels of the institutional variables contained in X as well as the control factors C are forced to be included in each selected model. Brambor et al. (2006) point out that even if a constitutive term (X_1X_2, X_1X_3, X_2X_3, X_1, X_2 and X_3 are the constitutive terms of the interaction $X_1X_2X_3$) of an interaction is insignificant in statistical terms (applying the usual t-test) this is not sufficient to leave out this constitutive term from the equation. According to them, there are two conditions which should be fulfilled before a constitutive term can be left out. First, "...the analyst should estimate the fully specified model [...] and find that the [coefficient of the constitutive term] is zero" (page 69). Second, the researcher "must have a strong theoretical expectation that the omitted variable [...] has no effect on the dependent variable in the absence of the other modifying variable..." (page 68). The first condition is taken into account by allowing all constitutive terms to be included in the model, a priori. Concerning the second condition, theory neither provides arguments for the exclusion nor for the inclusion of specific constitutive interaction terms. For the model selection we therefore rely on the empirical contribution of a constitutive term to the model fit measured by the Bayesian information criterion.

In line with Hendry and Krolzig (2004) and Acosta-González and Fernández-Rodríguez (2007), we checked the general unrestricted model (GUM) for validity by assessing our model set-up carefully. As long as theoretical, data-measurement, and model specification considerations are conducted appropriately the econometric set-up is not prone to the criticism of data-mining (Hendry and Krolzig, 2004). We tackle these issues thoroughly. We select the potentially interacting institutional variables by taking the theoretical model of Belot and van Ours (2004) as basis. Unfortunately, the theoretical literature is not particularly detailed about the link between unemployment and institutional interactions. Hence, we stick to the variables for which the selection is theoretically justified. Second, we use recently published panel data of institutional indicators which is superior to previously used data in order to have a reliable data basis. Finally, the model specification is evaluated either by performing tests of the final model or by directly incorporating the test decisions into the algorithm, depending on the specific

estimator.

Based on an objective function, we seek to identify the relevant institutional variables. We choose an information criterion as loss function in order to derive a high model fit by simultaneously penalizing for overparametrization. As the Bayesian Information Criterion (BIC) is consistent and seems to deliver superior results in model selection as pointed out by Kapetanios (2007) and Savin and Winker (2012), we select BIC as our target function. To avoid model misspecifications, we add a penalty to the objective function if the selected model has serially correlated errors based on the test developed by Born and Breitung (2013). The null is no serial correlation of order one. The objective function looks as follows:

$$f = (ln(\hat{\sigma}^2) + k\ln(NT)/NT)(1 + penalty), \tag{4}$$

where k denotes the number of estimated parameter. The *penalty* applies only if there is serial correlation in the errors:

$$penalty = \begin{cases} 0 & \text{if p-value} > 0.05 \\ 1/\text{p-value} & \text{if p-value} \leq 0.05 \end{cases}$$

In the following, the genetic algorithm is presented in more detail.[8] The heuristic optimization methods are mostly designed in line with the suggestions of Savin and Winker (2012) for dynamic panel model selection. Genetic algorithms (GA) update the whole set of solutions simultaneously (see also table 1 for a pseudocode). They rely on the principle of replicating the evolutionary process such that superior model set-ups have a higher chance to survive. To initialize the algorithm, we select an initial population (K) of 500 initial solutions as advocated by Savin and Winker (2012).[9] The members of the population are called chromosomes (φ) which are associated with randomly generated binary strings (genes) representing the model structure. For all initial solutions we perform an estimation, calculate the information criterion and report the elitist (=best among all candidate solutions).

After the initialization, the generations (G_{max},[10] predefined number) start by taking the best half of the originally generated solution (parents, K'). First of all, those are directly transferred to the new population and second, they are used to generate further solutions (children). This works as follows. Based on 100 randomly selected pairs of parents, 200 children (=new model structures) are formed by crossing them over. Moreover, the forty best parents - chromosomes

[8] We also checked local search heuristics like the Threshold Accepting (TA) algorithm as model selection techniques as well. Since TA delivers worse results in terms of the information criterion, we stick to the genetic algorithm (see chapter results). This finding - the superiority of the genetic algorithm within this type of model set-up - is in line with Savin and Winker (2012). More details of TA can be found in the appendix.

[9] The size of the initial set of the generated model structure (population) should be sufficiently large to allow for diversification such that a broad range of the search space is covered. Yet, it should not be too large to search efficiently through the search space finding the best solution.

[10] The number of generations (G_{max}) amounts to 500 (250,000 iterations divided by population size ($p = 500$) for each restart. We set the number of restarts to 10.

with best value of objective function - generate 40 children. This leaves us with overall 240 (C) solutions generated by the uniform crossover mechanism. To get the 10 further solutions, we use the ten best solutions (K^*) and change them at one random gene. Having formed a new population, the information criterion is calculated based on the estimation outcome. After sorting the new population by their objective function value, a random mutation, which refers to a small, if any, change of the model structure, is done to prevent the algorithm from a trap in a local minimum. This mutation is applied to the new population except the ten best model structures (K^{**}) and the ten children generated from K^* (elitist). Thereby, eight random elements (genes) are changed with probability 0.5 over all elements of the population described before. Again, at this step the elitist value and the associated model structure are stored. The algorithm runs either a predefined number of generations (G_{max}) or stops if all elements of the population have converged to be identical; implying that the algorithm has converged to an optimum.

Table 1: Pseudocode for Genetic Algorithm

Pseudocode for Genetic Algorithm	
1	Generate initial population K of p solutions φ, initialize G_{max}
2	**for** $g = 1$ to G_{max} **do**
3	Sort chromosomes in K
4	Select $K' \subset K$ (parent), select $K^* \subset K$ (etilist)
5	initialize $K'' = \emptyset$ (set of children)
6	**for** $c = 1$ to C **do**
7	Select individuals $x^{parent1}$ and $x^{parent2}$ at random from K'
8	Apply cross-over to $x^{parent1}$ and $x^{parent2}$ to produce x^{child}
9	$K'' = K'' \cup x^{child}$
10	**end for**
11	$K = (K', K'', K^*)$
12	Mutate $K \backslash K^* \backslash K^{**}$ at 8 random elements
13	**end for**

The description of the algorithm is mostly taken from Savin and Winker (2012).

5 Data

The analysis is based on a balanced data set with annual observations for 26 OECD countries from 2001 to 2008. It holds a set of six institutional variables, 57 institutional interactions, and four control factors. Summary statistics for the variables are given in the Annex in table 6. The estimation of a model with more than one interaction term is often blamed to suffer from multicollinearity. This is especially a risk if the constitutive terms, that is, the six institutional

indicators, are highly correlated. For our data sample, multicollinearity issues seem to play a minor role as 0.5 is the strongest correlation observed between two individual institutions; most of of them are closer to zero or even negative. The complete correlation matrix is given in the Annex in table 7. In terms of fixed-effects estimation, the problem of imprecise estimates through rarely changing explanatory factors over time is alleviated. In principle, the fixed effects absorb all time-invariant influences on the dependent variable. Estimating the impact of rarely changing variables on unemployment is difficult in such a set-up. However, while employment protection or bargaining coordination does not change much over time, interacting rarely changing variables provides substantial exogenous variation over time and enables the precise identification of interaction term coefficients.

5.1 Labour market performance

Several indicators like the unemployment rate, the employment rate, joblessness, or inactivity can serve as a proxy for labour market performance. The most prominent indicator in econometric studies has been the unemployment rate. Nickell and Layard (1999) argue that this is the best measure for labour market performance "because it is probably the least voluntary". The lower the unemployment rate the less persons are actively searching for a job and, consequently, the better the state of the labour market. However, measuring unemployment also has some drawbacks. It is difficult to compare unemployment rates across countries since national concepts might differ. A country could lower its unemployment rate by job creation schemes. In order to tackle this problem, the OECD constructed harmonized unemployment rates calculated according to international standards. These series are better suited for international comparisons of labour market performance than pure national numbers. Thus, our dependent variable is the harmonized unemployment rate provided by the OECD.[11]

5.2 Institutional variables

On basis of the theoretical model of Belot and van Ours (2004), six institutional factors are supposed to show an interdependent impact on unemployment.

The net replacement rate for an average production worker averaged over different family situations is used as an indicator for the generosity of the unemployment benefit system. It measures the unemployment benefits as a percentage of the last job wage. Note that this indicator has recently been published by the OECD and represents a substantial improvement over the gross replacement rates. This latter factor has been used in nearly all studies focusing on institutions. While gross replacement rates relate income during unemployment to the gross last job wage, net replacement rates refer to net last job wages. Comparisons both across

[11]For Switzerland, no annual harmonized unemployment rate is available. However, the OECD reports the unemployment rate for the second quarter of a year. This value is taken to approximate the annual unemployment rate for Switzerland.

countries as well as over time are much more reliable with the net indicator since differences or changes in the tax system do not have an effect on the replacement rate. Interestingly, Howell and Rehm (2009) report only a small correlation between the OECD gross and net replacement rates. This emphasizes the importance of considering the net measure to take the unemployment benefit system adequately into account.

The labour tax system is approximated by the tax wedge delivered by the OECD. This indicator measures the amount of income taxes and social security contributions paid by the employee, and payroll taxes and social security contributions paid by the employer, as well as family benefits received by the employee for an average production worker for different family situations as a percentage of the total labour compensation.

Employment protection can be well described by an OECD indicator which comprises information from different dimensions of employment protection. The values of this indicator which is a metric summary variable of various subfields of protection can theoretically lie within the range from 1 to 6, and are increasing in the degree of protection.

The degree of coordination between employers and employees in the wage bargaining process gives the level of bargaining coordination. It can take the values 1 to 5, where higher values indicate a higher degree of coordination. A value of 5 means economy-wide bargaining while a value of 1 expresses fragmented bargaining which takes place mostly at the company level. Note that this measure includes both the formal and the informal dimension of coordination. Soskice (1990) argues that bargaining centralization only measures the level at which bargaining takes place. Bargaining coordination, in turn, is a more general concept which comprises, besides bargaining centralization, of other forms of centralization. Even if a country exhibits rather decentralized bargaining, coordination could be high with a considerable impact on the wage bargaining process. Soskice (1990) takes Switzerland and Japan, both with highly decentralized, company-level bargaining, as examples to illustrate such distinct centralization and coordination measures. Coordination comes in through higher-level employer organizations in Switzerland, and informal wage cartels in Japan.

For union bargaining power, the union density, which measures the share of employees organized in unions, is provided by Visser (2011), and is our preferred indicator. Recently the union coverage has gained importance as an indicator for union bargaining power since it covers not only all employees organized in unions but all employees affected by union wage agreements. This indicator cannot be considered here due to inadequate coverage over time.

An indicator for product market regulation is available from the Fraser Institute which publishes the Economic Freedom of the World Index (Gwartney et al., 2012). This measure measure lies in the range from 1 to 10 and comprises information on business regulations stemming from seven sources: price controls, administrative requirements, bureaucracy costs, starting a business, extra payments/bribes/favoritism, licensing restrictions, and cost of tax compliance. In the original data source, the value is decreasing in the degree of regulation. In

order to ensure that deregulation is linked to decreasing indicator values for the institutional factors we multiply the product market regulation value with -1.

5.3 Control factors

Similar to Fiori et al. (2012), the output gap, which gives the percentage deviation of the cyclical component from trend growth, is used to control for cyclical fluctuations in (un)employment. Trend growth is calculated on the basis of a production function. Following Amable et al. (2011), three additional factors, the first time difference of the real exchange rate, the structural trade balance, and the average labour productivity are used as control factors. The data series are provided by the OECD via its Economic Outlook.

6 Results

The basic estimation approach is to apply the genetic algorithm as the preferred model selection tool in combination with a simple dynamic fixed effects estimator.[12] Theoretically, system GMM is superior but might be plagued by difficulties to determine the optimal instrumental variable structure. We later run the model selection approach with the system GMM estimator as a robustness check. While the statistical identification of relevant interaction terms can be reliably done with the model selection approach applied in this paper, a further step is needed to provide an economic interpretation of this finding. This is done by calculating marginal effects of the institutional factors. Assume the following model where the dependent variable Y is explained by three factors X_1,X_2 and X_3, and all possible interactions between these factors:

$$Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_1 X_2 + \beta_5 X_1 X_3 + \beta_6 X_2 X_3 + \beta_7 X_1 X_2 X_3 + \epsilon \tag{5}$$

The marginal effect of a factor X_1 on Y is then calculated as the first derivative of Y with respect to X_1

$$\frac{\delta Y}{\delta X_1} = \beta_1 + \beta_4 X_2 + \beta_5 X_3 + \beta_7 X_2 X_3. \tag{6}$$

Hence, the marginal effect of X_1 on Y depends on the estimated coefficients as well as on the level of X_2 and X_3 for a specific cross-section and a specific point in time. If an interaction term coefficient is not significantly different from zero, it can be left out and the corresponding levels are not relevant. Based on this example, marginal effects can be calculated for all countries on our sample for a given year. The marginal effect then shows what would happen to the unemployment rate if the value of an institutional indicator changed. Consequently, a positive

[12] This is equivalent to what has been reported by Savin and Winker (2012) who, on the basis of Monte-Carlo simulations, identified the genetic algorithm as the superior model selection tool.

marginal effect means that (de)regulation would raise (lower) unemployment. To illustrate our findings, we calculate the marginal effects for the institutional level in 2008 since this is the latest available observation. Following Greene (2002) (page 124), we calculate the standard errors for the marginal effects. This is more complex than for estimates without conditioning variables since we have to take covariances between interacting factors into account. More specifically, for the model given above, the standard error for the marginal effect of X_1 for instance, is given by

$$\sigma = \sqrt{var(\beta_1) + X_2^2 var(\beta_4) + X_3^2 var(\beta_5) + X_2^2 X_3^2 var(\beta_7) + 2X_2 cov(\beta_1, \beta_4) + ... \\ ...2X_3 cov(\beta_1, \beta_5) + 2X_2 X_3 cov(\beta_4, \beta_5) + 2X_2^2 X_3 cov(\beta_4, \beta_7) + 2X_2 X_3^2 cov(\beta_5, \beta_7)} \quad (7)$$

This standard error provides information on the precision of the estimation of the marginal effect for given values of the conditioning factors (X_1, X_2 and X_3 in the example given above). Hence, similar to the marginal effect, the standard errors depend on the country-specific institutional framework and can be calculated for each country separately. The information which is conveyed by the standard errors refers to the precision of the estimated marginal effect. A comparably low country-specific standard error indicates a low level of uncertainty surrounding the country-specific marginal effect. In contrast, high standard errors raise some doubts about the precise measurement of the marginal effect.

6.1 Fixed effects

The genetic algorithm identifies seven interactions as significant determinants of unemployment for the fixed effects estimator. Recall that we include the levels of the institutional variables in each model specification. Five variables are considered in at least one significant interaction term. Only the product market regulation variable does not interact with another institutional factor. This is contrary to recent evidence on a significant interdependent impact between labour and product market regulation on the labour market (Fiori et al., 2012). This unexpected finding could be the result of the particular modelling strategy which allows the comprehensive consideration of interdependencies. The interaction between product market regulation and labour market regulation in the literature could be driven by an omitted variable bias due to neglecting further relevant interactions. Alternatively, we cannot rule out that there simply has not been an interdependent relationship between labour and product market regulation for the specific country sample and time period in this study. The insignificant coefficient of product market regulation (see table 4) points in this direction. In summary, there is a conditioning effect from other institutions for a change of five institutional factors. This highlights the importance of interdependent institutional influences on the labour market and the need for considering the country-specific institutional set-up when conducting labour market reforms.

Furthermore, the appearance of higher-order interaction terms in the finally selected model

emphasizes the complexity of the interplay of different institutional factors. This is of particular relevance for theoretical models builders who should not restrict their models to bivariate or subjectively selected interactions.

A deeper look into the results reveals that four bivariate interactions, employment protection and the net replacement rate, the net replacement rate and either labour taxes and union density, as well as bargaining coordination and union density have a relevant influence on unemployment. Furthermore, the trivariate interaction terms between, first, employment protection, labour taxes and bargaining coordination, and, second, between the net replacement rate, bargaining coordination and union density, as well as the fourfold interaction between employment protection, the net replacement rate, labour taxes and bargaining coordination appear to be important for unemployment.

The results displayed in table 2 show that especially deregulating reforms of labour taxes, product market regulation, bargaining coordination and bargaining power (approximated by union density) have the potential to reduce unemployment in the majority of countries since the majority of marginal effects of these factors are positive. Overall, lowering the taxation of labour is correlated with a reduction in unemployment in 19 countries out of 26 of the sample, while lowering the workers' bargaining power as well as increasing competition in the product market would be successful in all 26 countries. In contrast, reducing the level of employment protection and the level of unemployment benefits would have detrimental labour market effects in the majority of countries. This can at least partly explain the mixed impact of a change in employment protection and unemployment benefits on the labour market (Howell et al., 2007). The particular outcome of a change in the respective institution depends on other institutional factors. While our results suggest that increasing product market competition is beneficial for the labour market, this estimate is not significantly different from zero.[13]

Table 2: Marginal institutional effects (fixed effects)

	Employment protection	Replacement rate	Labour taxes	Bargaining coordination	Union density	Product market regulation
Number of positive marginal effects out of 26 countries	7	9	19	22	26	26

A positive marginal effect means that regulation (which means a higher level of the institutional indicator) is linked to a higher unemployment rate. Correspondingly, deregulation is then correlated with improved labour market performance.

In the following, we compare labour market effects through institutional changes for differ-

[13]It nevertheless appears in the result tables since the level of all six institutional factors are forced to be included in the selected model.

ent groups of countries which are often assumed to differ in their institutional design: Scandinavian countries (Sweden, Norway, Finland, Denmark), Middle-European countries (France, Germany, Netherlands, Switzerland, Belgium, Austria), Anglo-Saxon and Asian countries (Australia, Canada, Ireland, Japan, Korea, New Zealand, United Kingdom, United States), Southern-European countries (Italy, Portugal, Spain, Greece), and Eastern-European countries (Czech Republic, Hungary, Slovakia, Poland). Indeed, we find substantial differences in the estimated labour market reactions following an institutional change across groups. The groups of Southern-European, Middle-European countries and Eastern-European countries mostly show positive marginal effects. Hence, an institutional change that deregulates the institutional set-up would lead to a fall in unemployment in these countries. In contrast, especially in the Anglo-Saxon and Asian, but also in the Scandinavian countries the picture is somewhat different. Here, deregulation would to a larger extent have a detrimental impact on the labour market. The following table 3 summarizes the group-specific marginal institutional impact on unemployment by showing the share of countries with positive marginal effects (decrease in the level of regulation leads to an increase in unemployment). The most heterogeneous outcome for the different groups can be observed for employment protection, unemployment benefits and labour taxes. Reducing the level of employment protection is linked to a drop especially in unemployment only in Southern-European and Middle-European countries while it has a detrimental labour market impact in all remaining groups. Concerning unemployment benefits, Eastern-European countries show a close relation between a reduction in the net replacement rate and the unemployment rate. In the other groups, the same relation is only given for a small subset of countries. Generally, the interpretation for marginal institutional effects based on interdependencies is difficult since clear theoretical predictions are not available for all institutional factors, and since interdependencies comprise up to four factors. Nevertheless, some considerations on the interaction effects are given in the following to illustrate how the same reform can produce opposing outcomes.

According to Arpaia and Mourre (2012), employment protection is particularly relevant in countries where redistribution policies are inefficiently organized and insurance against labour market risks (becoming unemployed) is therefore limited. Hence, the level of employment protection should be high in countries with a low level of unemployment benefits. However, there is a positive correlation between the level of employment protection and net replacement rates in our data sample. Countries with strict employment protection also exhibit a generous unemployment benefit system (see table 7). Yet, this could explain why reducing employment protection would be beneficial in countries with high unemployment benefits (and vice-versa). The combination of high regulation of both factors is not efficient and one of the two factors could be deregulated without generating negative labour market effects. According to our findings, the interdependent labour market effect of employment protection and unemployment benefits also depends on the labour tax system and the degree of bargaining coordination. More specifically, countries with a higher degree of bargaining coordination as well as with

higher labour taxes are more likely to show a beneficial labour market impact through reducing employment protection. Especially bargaining coordination could work as a moderating factor.

Potential externalities of the EPL reduction are likely to be compensated through the absence of non-coordinated behaviour of either employers or employees (Baccaro and Rei, 2007). For instance, informal agreements between the employer and the worker side (what is captured in the coordination variable) could avoid that the increase in employer bargaining coordination (due to the loss in EPL strictness) transforms in increased labour transition rates, lower wages and, consequently, less labour supply.

In contrast to employment protection, reducing unemployment benefits additionally depends on the level of union density (besides the interdependency with employment protection, labour taxes and bargaining coordination). The results show that reducing net replacement rates is beneficial in countries where the level of worker bargaining power (measured by union density) is comparably low. Lower unemployment benefits increase labour supply since the outside option becomes less attractive. Since the increased labour supply is especially unemployment-reducing in countries with low union density we can assume that this effect is mainly driven by moderate wage claims through low union density.

Table 3: Share of positive marginal institutional effects: Country groups

	Employment protection	Replacement rate	Labour taxes	Bargaining coordination	Union density	Product market regulation
Anglo-Saxon+Asian (8)	0	0.25	0.375	0.75	1	1
Eastern-European (4)	0	1	0.75	1	1	1
Southern-European (4)	0.75	0.25	0.75	1	1	1
Middle-European (6)	0.67	0.17	1	1	1	1
Scandinavian (4)	0	0.25	1	0.5	1	1

A positive marginal effect means that regulation (which means a higher level of the institutional indicator) is linked to a higher unemployment rate. Correspondingly, deregulation is then correlated with improved labour market performance. Each value reflects the share of positive marginal effects within a country group to the number of countries in that group. Hence, the higher the value the more likely is a positive marginal effect in that group. The number of countries in a group is given in parentheses.

Table 3 as well as the estimated marginal effects provided in table 4 suggest that institutional reforms provide the opportunity to reduce unemployment in all countries. Table 4 provides the marginal effects for 5 selected countries, one from each group, for all six institutional factors.

Concerning employment protection, an increase in the EPL indicator (ranging from 1 to 6) by one point would change unemployment by between -4.7 and 0.25 percentage points depending

Table 4: Marginal institutional effects for selected countries

	Employment protection	Replacement rate	Labour taxes	Bargaining coordination	Union density	Product market regulation
Australia	-4.718	-0.078	-0.086	0.191	0.343	0.110
	(0.937)	(0.040)	(0.048)	(0.308)	(0.055)	(0.125)
Czech Rep.	-1.098	0.097	0.023	1.409	0.236	0.110
	(0.402)	(0.030)	(0.039)	(0.264)	(0.042)	(0.125)
Spain	-0.152	-0.070	0.075	1.408	0.144	0.110
	(0.543)	(0.070)	(0.053)	(0.325)	(0.044)	(0.125)
Germany	0.246	-0.113	0.071	1.431	0.139	0.110
	(0.611)	(0.045)	(0.045)	(0.289)	(0.044)	(0.125)
Sweden	-0.237	-0.088	0.046	-0.905	0.183	0.110
	(0.460)	(0.047)	(0.041)	(0.318)	(0.042)	(0.125)

A positive marginal effect means that regulation (which means a higher level of the institutional indicator) is linked to a higher unemployment rate. Correspondingly, deregulation is then correlated with improved labour market performance. Standard errors are in parenthesis.

on the country. Besides the relevance of interdependencies with other institutional factors, this wide range might be further explained by the fact that the EPL indicator comprises of both protection for temporary and for permanent employment. Recent evidence suggests that both elements work in opposite directions (Sachs, 2012). More concretely, reductions in the regulation of flexible employment are likely to increase unemployment (Cahuc and Postel-Vinay, 2002; Blanchard and Landier, 2002). If changes in employment protection have been mainly driven by changes of the regulation of flexible employment in the sample period, the negative marginal effects are not surprising.

A reduction in the net replacement rate by 1 percentage point would be related to an unemployment rate which is 0.1 percentage points lower in the Czech Republic, and around 0.1 percentage points higher in Australia, Sweden, Germany and Spain. In contrast, reducing labour taxes by one percentage point corresponds to higher unemployment in Australia (+0.08 percentage points), and to lower unemployment in the remaining four countries (-0.02 and 0.08 percentage points). While these effects are rather small in economic terms, changing the bargaining power (proxied by the union density) shows larger effects. A reduction in the union density by 1 percentage point is linked to a reduction in the unemployment rate between 0.14 and 0.34 percentage points. Since product market regulation does not interact with other institutional factors in our sample the effect on unemployment is identical for all countries. A rise in competition (a fall of the indicator value by one point) due to, for instance, decreased bureaucracy costs or a reduction in price controls leads to a reduction in unemployment by 0.1 percentage points. Finally, reducing bargaining coordination was successful in four of the five

countries. A one point drop in the indicator value is related to a reduction in unemployment between 0.19 and 1.43 percentage points. Concerning the preciseness of the estimated marginal effects, the standard errors are comparably high especially for labour taxes and employment protection for all five countries, and for bargaining coordination for Spain and bargaining coordination for Australia. The remaining institutional marginal effects are estimated with high precision.

The effects are substantial for some reform components and for some countries. Nevertheless, especially the marginal effects of changes in employment protection and bargaining coordination should be interpreted with caution. Both indicators are rather crude measures. For the remaining institutional variables, the marginal effects provide a reasonable approximation for potential changes in unemployment following a labour market reform.

6.2 GMM

The fixed effects estimates could be biased due to the correlation of the lagged dependent variable with the error term through the country-specific fixed effects. We therefore run the genetic algorithm with the theoretically preferred system GMM estimator. Overall, the findings are similar to the results produced with the fixed effects estimator. Still, seven interactions terms are identified as relevant for explaining unemployment. However, the interactions between employment protection and unemployment benefits as well as between unemployment benefits and labour taxes are not selected within the GMM estimation. In contrast, the interactions between employment protection and labour taxes as well as between employment protection, unemployment benefits and labour taxes are chosen through the genetic algorithm. This change in the selected model results in a slightly different pattern of positive marginal effects across countries. The number of positive marginal effects, illustrated in the following table, increases for employment protection from seven to 14, and for labour taxes from 19 to 20, while it decreases for unemployment benefits from nine to eight. The remaining numbers do not change. The superiority of the GMM over the fixed effects estimator, however, hinges essentially on assumptions which can be tested (see chapter 3 for a brief discussion). Unfortunately, already the Sargan test for overidentifying restrictions of the first-step estimator performs rather dubious since the p-value of this test equals 1 for virtually all models. This is a well-documented shortcoming of the Hansen test (which is a more general form of the Sargan test based on the estimated variances of the first-step estimation) in case of instrument proliferation. For the Hansen test, reducing the set of instruments could alleviate the problem. However, this should not be the case for the Sargan test. Estimating the second-step GMM estimator with a collapsed instrument set and applying the Hansen test which is, in contrast to the Sargan test, robust to heteroskedasticity would be a reasonable solution. We run the system GMM estimation with a collapsed instrument set following Roodman (2009). As expected, the Hansen test performs poorly and the findings are unstable. As already stated, the second-step weighting

Table 5: Marginal institutional effects (GMM)

	Employment protection	Replacement rate	Labour taxes	Bargaining coordination	Union density	Product market regulation
Number of positive marginal effects out of 26 countries	14	8	20	22	26	26

A positive marginal effect means that regulation (which means a higher level of the institutional indicator) is linked to a higher unemployment rate. Correspondingly, deregulation is then correlated with improved labour market performance.

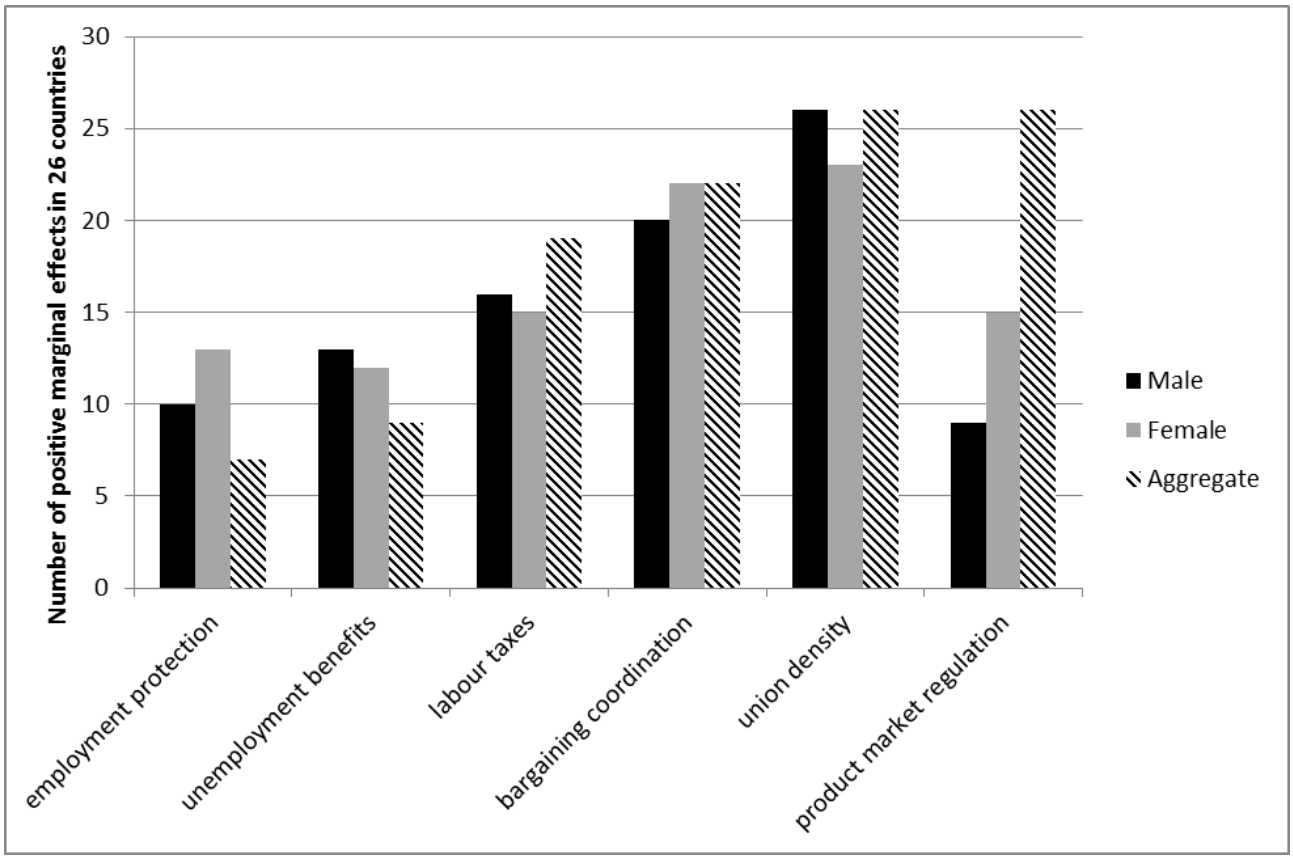
matrix seems to be poorly identified which results in these unstable second-step estimates. We therefore have to assume that the selected instruments are invalid, and that the system GMM estimator does not provide reliable results for our model structure. Therefore, we trust the fixed effects findings more. As a consequence, we accept the consequences of the potential Nickell bias due to the dynamic structure of our model.

6.3 The role of gender

Up to now, we have focused on the aggregate unemployment rate as our variable of interest. Nevertheless, recent research (Bertola et al., 2007; Di Tella and MacCulloch, 2005), for instance) suggests that institutional changes affect distinct groups differently, depending on the respective labour supply elasticities. Consequently, we expect that different models are selected once we distinguish between the unemployment rates of males and females. According to Bertola et al. (2007), we suppose that female employment react stronger to changes in the institutional environment due to a more elastic labour supply. More specifically, the theoretical model of Bertola et al. (2007) predicts that female employment reduces more than male employment when stronger unions demand higher wages caused by the steeper labour supply function of females. Hence, we assume that institutional changes which make the labour market more flexible should reduce female employment more than male employment. In order to determine the impact on unemployment, however, one has to take into account that unemployed might leave the labour market and move into inactivity. A reduction in employment is not necessarily related to an increase in unemployment as long as the new unemployed leave the labour market. We assume that movements into inactivity are negligible, and that the drop in employment translates into an increase in unemployment. This might likely be larger for female than for male employees through flexibilisation. Consequently, we expect that the number of positive marginal effects is larger for female than for male unemployment for all six indicators.

The following figure 1 gives an overview on the different marginal institutional effects for

Figure 1: Number of positive marginal effects in 26 countries separated by gender



the unemployment rates of males and females, and for the aggregate unemployment rate. Overall, our hypothesis that there are more positive marginal effects for female unemployment only holds for employment protection, bargaining coordination, and for product market regulation. For unemployment benefits, labour taxes and union density, the positive marginal effects prevail for male unemployment. The largest difference between male and female unemployment can be documented for product market regulation. Female unemployed would benefit from a deregulation in this category in 15 countries, while it would be 9 for male unemployment.

Similar to the aggregate unemployment rate, reductions in the level of regulation of labour taxes, bargaining coordination, and union density would be successful in the majority of countries. The impact of deregulations of employment protection as well as unemployment benefits is less clear, it heavily depends on the country-specific institutional framework. The findings for product market regulation are somewhat surprising since the impact of an increase in competition is homogeneously beneficial for aggregate unemployment. This is partly due to the fact that product market regulation appears as a significant interaction partner in the models for gender-specific unemployment.

7 Conclusion

This paper analyses the impact of interdependencies between institutional factors for the evolution of unemployment. Based on an innovative model selection approach, which is combined with a classical dynamic fixed-effect estimator for a two-way error component model, higher-order institutional interdependencies are identified for a panel of 26 countries ranging from 2001 to 2008. Thereby, we apply a genetic algorithm being a heuristic optimization method which has not been used within the unemployment-institution literature. In contrast to the previous literature, this paper is the first to focus on the impact of higher-order institutional interactions on unemployment and one of the first to consider a dynamic model specification in the context of institutional interactions. It thereby allows for a more precise and detailed analysis of the impact of interdependencies between different labour market institutions on labour market performance on a cross-country level.

The results suggest that there are substantial differences across countries in the labour market impact of institutional changes for nearly all selected institutional indicators. Hence, the impact of a reform of employment protection, unemployment benefits, labour taxes, bargaining power, and bargaining coordination crucially depends on the country-specific institutional setting.

Especially, reductions in labour taxes, bargaining power, product market regulation, and bargaining coordination seem to be unemployment-reducing in the majority of countries. In contrast, lowering employment protection and unemployment benefits are much less likely to have the trivially expected consequences that deregulation is the road to success, although such reforms would be beneficial in some countries.

It further stands out that five of the six institutional categories matter as conditioning factors. This is particularly relevant for theoretical models by providing, first, empirical evidence that institutions are linked in a more sophisticated way than considered before, and, second, empirical guidance which institutional factors should be considered in such interdependencies.

We further document that institutional changes have a heterogeneous impact on the male and female unemployed. According to theory we expected that institutions positive marginal effects in the majority of countries, especially compared to male unemployment. Indeed, we confirm this hypothesis for three institutional factors; employment protection, bargaining coordination, and product market regulation. However, we find a larger number of positive marginal effects for unemployment benefits, labour taxes and bargaining coordination for male unemployment. Hence, we document that institutional changes show a heterogeneous impact not only across countries, but also across gender. Yet, the model setup with a specific set of interactions has only limited power to explicitly identify the drivers for the distinct marginal institutional effects for male and female unemployment.

Note that the findings should be interpreted with caution. Due to the lack of adequate

instruments and the inability of the system GMM estimator to provide reliable results, no causal relationship between institutions and unemployment can be set up. Furthermore, while the selection of institutional factors is derived directly from theory, additional institutional factors like active labour market policies or family policies might influence the findings. Nevertheless, the findings provide robust evidence that (i) interdependencies are crucial for the labour market effect of an institutional reform (ii) the order of interactions is rather high since five of six considered factors are involved in relevant interaction terms and (iii) reform recommendations should not be based on success stories from specific countries, but on an accurate evaluation of the country-specific institutional setting.

While the findings provide reliable qualitative evidence on the role of institutional interactions, improvements in data coverage and quality could pave the way to a more profound quantitative analysis of conditional institutional effects on the labour market.

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Annex

Threshold Accepting (TA): The model structure is initialized randomly with a binary string of zero and ones (φ^0). Based on the randomly initialized model structure, the estimation is performed and our objective function is calculated. This value and the model structure are stored. After the initialization, the iterations start. In each iteration step a new solution (φ^1) which is a neighbour to the current solution is derived. Two regressors out of all potential regressors are selected randomly. The following rule applies: The first regressor is included if it was excluded before and the second vice versa. This corresponds to a Hamming Distance of two. Based on this new structure, the new information criterion is calculated. Then, the difference of the previous and the new value of the loss function is calculated. If the difference is smaller than the corresponding value of the threshold sequence (τ) the new structure is accepted else the previous combination is restored. We use a data-driven threshold sequence as advocated by Winker and Fang (1997) which is based on differences of the objective function. These are generated by running the algorithm without the acceptance criterion and taking the difference of the initial value and new objective function. The threshold sequence for the threshold accepting algorithm gets linearly lowered to zero within 60% as recommended by Savin and Winker (2012). In each iteration step the elitist is preserved to account for potential impairments of the objective function. The next iteration step follows until the predefined number of iterations (I_{max}) is done.

Pseudocode for Threshold Accepting

```
1  Generate at random a solution φ^0, initialize I_max and τ
2  for I = 1 to I_max do
3     Generate at random neighbor φ^1 ∈ (φ^0)
4     if f(φ^0) - f(φ^1) < τ then
5        φ^0 = φ^1, keep elitist
6     end if
7     Reduce τ
8  end for
```

Table 6: Data summary statistics

	Median	Minimum	Maximum	S.D.
Unemployment rate	6.08	2.53	19.98	3.46
Employment protection	1.90	0.21	3.67	0.77
Net replacement rate	0.73	0.55	0.86	0.08
Labour taxes	0.35	0.10	0.49	0.10
Bargaining coordination	3.00	1.00	5.00	1.21
Union density	0.22	0.08	0.78	0.19
Product market regulation	-6.60	-10	-4.10	0.89
Real exchange rate	0.00	-14.10	24.51	2.91
Productivity	4.83	4.51	5.01	0.11
Trade balance	-0.02	-73.69	22.54	11.88
Output Gap	1.10	-4.54	9.00	2.35

Table 7: Correlation coefficients between institutions

	EPL	NRR	TAX	COO	UDE	PMR
Employment protection (EPL)	1.00	0.37	0.50	0.42	0.06	0.32
Net replacement rate (NRR)		1.00	0.21	0.38	0.36	-0.09
Labour taxes (TAX)			1.00	0.23	0.33	0.24
Bargaining coordination (BCO)				1.00	0.37	-0.02
Union density (UDE)					1.00	-0.38
Product market regulation (PMR)						1.00

Surveillance and Control of Fiscal Consolidation on a Supranational Level

DRAFT VERSION

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Contents

Executive Summary

Strengthening budgetary surveillance and coordination of budgetary policy measures in the EU is of vital importance for economic stability and growth. The decentralised decision making structure in most areas of budgetary policies, requires the need to balance national and common objectives; clearly also given the context of highly integrated goods-, labour-, and financial markets that lead to significant interdependencies and spillovers, as e.g. the recent financial crisis and economic slowdown demonstrate. We analyse the progress that is underway in the current budgetary governance framework in the EU -including the recent new instruments in the form of the Macroeconomic Imbalance procedure, the European Semester, Stability Bonds, the European Financial Stability Facility, Euro+ Pact and Europe 2020. This paper surveys supranational governance in the EU, and the coordination of national policies, including concepts of fiscal federalism, multi-level governance and open coordination methods, control and systems methods and macro-finance. We relate this exercise to the current context of budgetary stress in the aftermath of the global financial crisis and economic slowdown which has strongly impacted on the economies and public finances of the Member States. We consider financial market conditions that have exerted a particular strong influence in the European debt crisis and evaluate specifically the merits and risks relating to proposals for the introduction of Eurobonds. We conclude by formulating the policy recommendations on streamlining EU economic and budgetary governance that could be drawn from our analysis.

1. Introduction

The *global financial crisis* has made a strong negative impact on the European economy[1] the last four years: a substantial and persistent recession has occurred, unemployment has reached record levels and fiscal balances have deteriorated significantly as a result of the recession, fiscal interventions to prevent a systemic break-down in the financial sector and other fiscal stimulus measures. Interventions by national governments, European Union (EU) and the ECB in the European financial sector were necessary as a systemic banking crisis in one country could become also fairly easy a threat to other countries, because of the highly integrated financial markets inducing spillovers and contagion effects. Public finances in many EU member states substantially deteriorated due to the combination of saving the banking sector and fighting the recession. As a result the European Union is currently confronted with a *debt crisis*, especially in the peripheral countries of the euro area.

Most EU countries face a combination of weak economic performance and a pressing need for *fiscal consolidation* given the sharp deterioration of government budget balances and a parallel increase in debt to GDP ratios. In some Member States, the situation of the public finances became so critical as to put their fiscal sustainability at risk. The spreads on sovereign interest rates increased and large financial assistance packages from the European Union and the IMF were necessary for Greece, Ireland, Portugal, Spain and Cyprus. In parallel, a permanent mechanism, the European Stability Mechanism (ESM)[2] was agreed upon to provide assistance to euro area Member States in the future. Weak economic conditions complicate fiscal adjustments: automatic stabilizers will lead to a drop in revenues and an increase in spending. Fiscal consolidations and structural reforms –while beneficial in the long run- may in the short run put downward pressure on an already stressed economy and thus lack political and social support.

Europe's financial, budgetary and economic crisis has pointed at various shortcomings of the current *economic and budgetary governance framework* in place[3]. Under *systemic stress* these shortcomings manifested themselves more clearly than before. Responses to the crisis by policymakers at the national and supranational levels have been perceived as inadequate, uncoordinated and inconsistent by and large. A fundamental question remains whether the budgetary governance framework provided by the Excessive Deficit Procedure (EDP) -even if augmented and adjusted now in various manners-, constitutes an adequate governance framework or than more fundamental flaws are present.

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[1] In this article we will often use the terms "European", "European Union (EU)" and "Euro Area" interchangeably. Clearly, not all European countries are member of the EU and not all EU countries are member of the Euro Area. Some countries may accede in the near or more distant future. Others –consider the case of the UK e.g.- may decide to secede again. Disentangling all configurations all the time would clearly be rather tedious.

[2] Gocaj and Meunier (2013) describe in detail the creation process of the ESM.

[3] In its Governance Whitepaper the Commission of European Communities (2001) defines European governance as 'rules, processes and behaviour that affect the way in which powers are exerted at the European level, particularly as regards openness, participation, accountability, effectiveness and coherence.'

Rather than searching for approaches that seek to further modify, refine and adjust the existing fiscal governance framework –the approach that the EU Commission has adopted essentially-, this paper tries to explore ways to address more fundamentally apparent flaws in/ alternatives to the existing fiscal governance framework and makes suggestions to create a new, improved governance framework for fiscal policy in the euro area. Essentially we argue in favour of a broader fiscal governance framework that is much more oriented towards actual *budgeting and budget processes*: from passive, accountant-like supranational governance an evolution towards active, initiating, steering, process-oriented, network-based governance framework is advocated.

More specifically, we consider four approaches that we think can make significant contributions to budgetary governance in the EU: (i) the economics inspired approach of *fiscal federalism* which provides a framework for a consistent governance framework for fiscal policy and fiscal consolidation in the euro area, (ii) the political science oriented approach of *multi-level governance and open coordination*, (iii) the systems, control and network theory oriented approach of *hierarchical control* that studies the control of large, complex hierarchical systems, (iv) the macro-finance oriented approach of stress-testing, early-warning-systems and resilience.

A common element in these three approaches is that these approaches would take a *process-based* view when applied to fiscal governance in the EU: according to these approaches the EU fiscal governance framework would need to be linked much more closely to the actual budgeting process of governments at different layers and integrate these budgeting processes of different government layers in order to come to a clear, consistent and effective fiscal governance framework: in this way a much stronger fiscal governance framework in the EU could be envisaged. This in contrast to the current *procedural-, indicator-, outcome- and rule based* fiscal governance framework of the SGP that remains a partial, ad-hoc, and ex-post construct. Indicators like the fiscal deficit and government debt e.g. represent essentially the final outcomes of expenditures and revenues in the entire budgeting process and do not provide much guidance when one would like to design and implement an active fiscal governance framework. We relate our findings to the discussion about economic -, monetary and banking-, fiscal -, and political union in the EU.

Section 2 provides an outline of the current budgetary governance framework in the EU. Section 3 considers aspects of fiscal federalism and their potential EU related context. Section 4 takes a political science and public policy perspective on budgetary governance. Section 5 looks at budgetary governance in the EU from systems and control theory. Section 6 considers a macro-finance perspective on budgetary surveillance and management. The conclusion of the paper summarises the main findings.

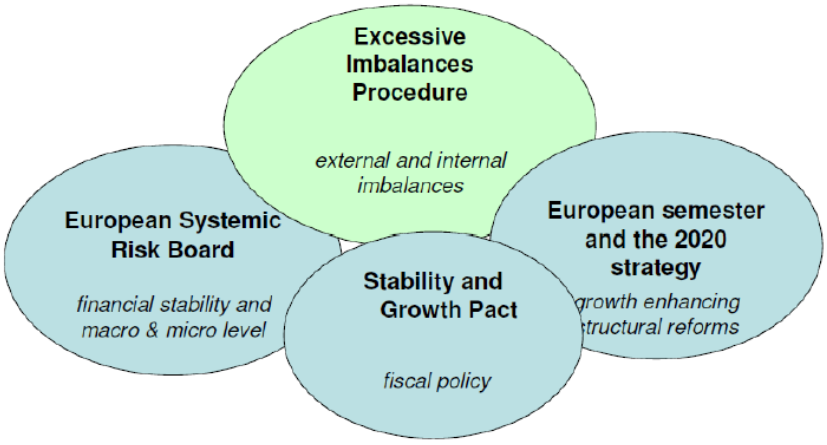
2. The Existing Budgetary Governance Framework in the EU.

Aim of this section is to outline the recent adaptations to the Excessive Deficit Procedure, the core construct of the current budgetary governance framework in the EU.

2.1 The Current Economic Governance Framework

The EU economic governance framework has undergone a number of smaller and larger transformations recently as a result of the policy needs experienced in coping with financial -, budgetary -, and economic distress. Schematically, we can graphically depict the current framework as follows:

Figure 1 **The EU Economic Governance Framework**



The Stability and Growth Pact and the European Semester and Europe 2020 strategy have been subject to minor changes. The Excessive Imbalances and the European Systemic Risk Board are entirely new governance layers. A weakness of the framework is that the different parts are not (yet) well connected and integrated into one overarching governance framework: the current crisis in Europe demonstrates that growth, employment, budgetary stability and financial sector stability are all interconnected and can not be analysed well in isolation.

An important lesson learnt from the crisis is that the *Excessive Deficit Procedure of the Stability and Growth Pact (SGP) of Economic and Monetary Union (EMU)* by itself was not sufficient to ensure sound public finances. Beside some flaws in design and more general weakness in terms of enforcement and commitment, more concrete implementation problems became evident as a result of the European debt crisis, e.g. limited use of the instrument of early warnings by the Commission and even more limited follow up of these early warning by the Council. By focusing on purely fiscal indicators the SGP was not equipped to prevent the accumulation of macroeconomic imbalances: it does not delineate clearly enough instruments,

indicators and targets. These flaws may have also contributed in deferred but massive impacts on the public finances of some Member States that showed apparently sound fiscal position before the recession. Delivery on fiscal positions was less than satisfactory. Excessive reliance on the change in the fiscal balance, e.g. masked a widespread use of windfall revenues to offset expenditure developments. The EDP appears not to be well equipped to identify and diagnose disorders and imbalances, formulate instruments and treatments, implement policies, evaluate their progress, undertake corrections if necessary and formulate an ex-post evaluation in a systematic, consistent and timely manner.

To mend such weaknesses, the European Commission has proposed during 2011 and 2012 several reforms of the economic and budgetary surveillance framework[4], in the form of the "*Six Pack" and "Fiscal Compact"* and a streamlining of reporting schedule in form of the *"European Semester"*. The changes consist of amendments to the two regulations that implement the preventive and the corrective arms of the SGP, a new directive on minimum provisions for national fiscal frameworks and a new regulation that introduces sanctions to the preventive arm of the Pact and strengthens those applicable under the corrective arm. With the Fiscal Compact, EU governments and the European Commission have decided to adopt fiscal rules which limit the fiscal room for manoeuvre beyond the reformed Stability and Growth Pact of 2005. The Fiscal Compact imposes two new rules: first, the objective of balanced budget is respected if the structural (or cyclically-adjusted) deficit is below 0.5% of GDP; second, countries whose public debt exceeds 60% of GDP reduce their debt "at an average rate of one-twentieth per year as a benchmark." The balanced structural budget rule introduces two novelties in comparison with the former SGP: first, the limit at 0.5% of GDP, and, second and consequently, the speed of adjustment towards this limit losing its country-specificity.

The reforms are part of a package that also includes two new regulations on a new economic imbalances procedure. The "Six-Pack" adopted on November 16, 2011 introduced two Regulations dedicated to the prevention, monitoring, and correction of excessive macroeconomic imbalances, in short the Macroeconomic Imbalance Procedure (MIP), an interactive platform that provides the Scoreboard and Additional indicator data used in the Alert Mechanism Report of 14 February 2012 and its Statistical Annex. The main innovations are, first, the inclusion of a Scoreboard of macro indicators with thresholds, and second, the creation of an Excessive Imbalance procedure (EIP) in case imbalances are deemed excessive. All this therefore, very much as an analogue to the stipulations of the SGP/EDP on fiscal sustainability. Many indicators are also directly or indirectly related to indicators in the European Commission's Europe 2020 framework for long-term growth and sustainability.

The Scoreboard reflects indicators of either internal or external disequilibrium. They are used to detect early imbalances that may be dysfunctional for a Member State economy, for the euro area, or for the entire EU. Internal disequilibria are scrutinized through data of public and private indebtedness, stock and real estate prices, credit flows, and unemployment. External

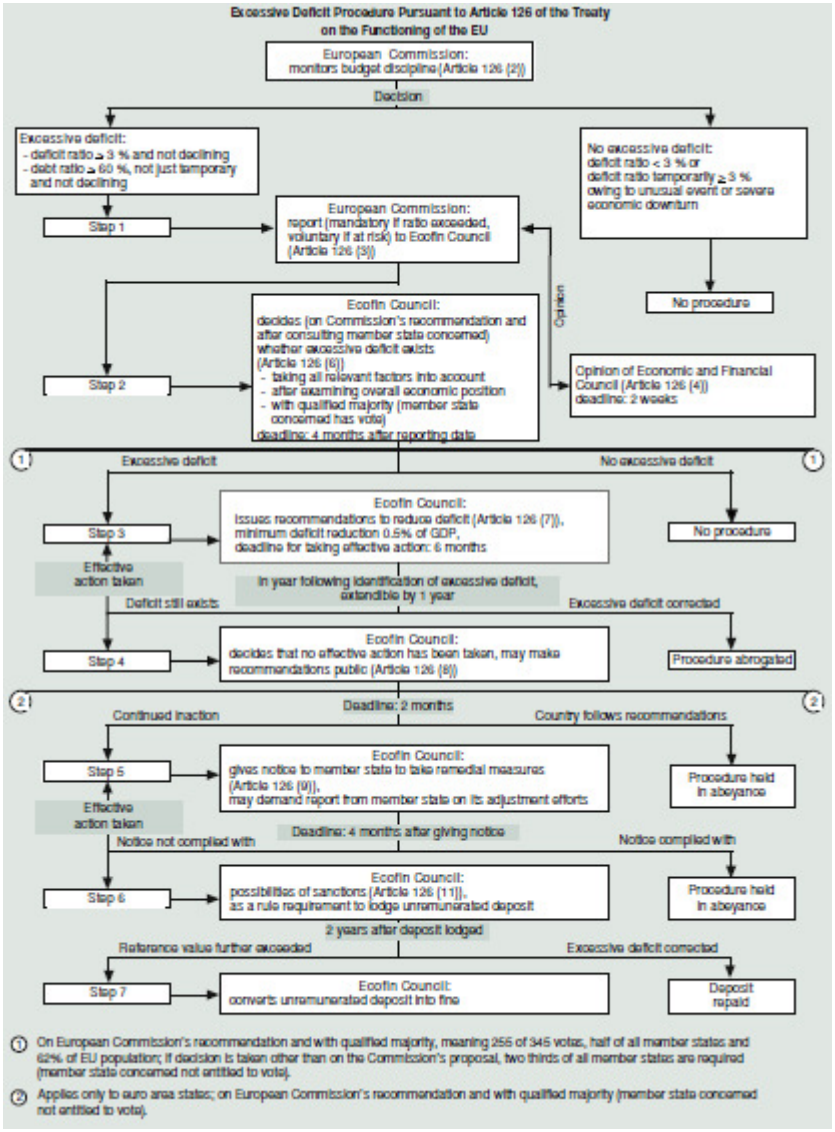
[4] See also European Central Bank (2011) for a more detailed overview on the reforms of the euro area's governance framework.

disequilibria are scrutinized through current account balances, net external positions, real effective exchange rates, market shares, and nominal unit labour costs.

After an in-depth review, the Council can send recommendations to a country experiencing excessive macro imbalances. The Council imposes an interest-bearing deposit to the country under the excessive imbalance procedure. If the country does not take the recommended corrective actions, the deposit is transformed into a fine, amounting to 0.1% of the Member State's GDP in the previous year.

Bofinger and Ried (2012) analyse the organisation of the EDP in detail and summarise the procedures in the following flow-chart:

Figure 2 **Excessive Deficit Procedure**



Source: Bofinger and Ried (2012).

Bofinger and Ried (2010) list four problems with the current EDF in the current crisis context: (i) the EDP is pretty much a *black box* for both the general public and policymakers alike, (ii) there is no *coordination* of national consolidation efforts, (iii) the SGP does not spell out mechanisms for *mutual support* and (iv) there is no mechanism for *government insolvency*. To overcome these deficiencies, Bofinger and Ried (2010) propose a new framework for fiscal policy consolidation in Europe. At its centre is a European Consolidation Pact (ECP) that supplements the SGP in times of crisis. This pact may be used as common ground for the consolidation conditions currently imposed on crisis countries in an ad-hoc manner in return for a rescue package or the European Stabilisation Mechanism.

The budgetary governance framework in the EU is concentrated in the EDF. The recent European debt and economic crisis has induced several changes to the governance framework as national and supra-national governance appeared not sufficiently equipped to handle such a large-scale crisis.

3. An Economic Perspective on Budgetary Governance: Fiscal Federalism and the EU.

With the completing of Economic and Monetary Union (EMU), there has been an intense discussion about the desirability and feasibility of *fiscal federalism* or "fiscal union" in the EU, as a natural requirement for a coherent operation of Economic and Monetary Union. The debate around fiscal federalism in the EU focuses on the instruments needed and for the implications stemming from the distribution of powers between different government tiers. The EU in its original form can be described as a *confederation* of (otherwise sovereign) states. In a longer term perspective the question is inevitable whether or not the EU needs to evolve into a *federal state* for its (current and envisaged) modes of economic -, monetary -, fiscal -, and political union actually to be sustainable. The discussion about fiscal federalism in EU is in particular centered around the 'subsidiarity principle", an organising principle of decentralisation[5], according to which a matter ought to be handled by the smallest, lowest, or least centralised authority capable of addressing that matter effectively. In fact, a distinct, decentralised modality of fiscal federalism already exists in the EU: The EU stands at the extreme of decentralisation when compared with the other federations given that the allocation -, redistribution - and stabilisation functions are essentially performed at the national level (rather than also by the EU budget as it typically would in a more mature federation).

[5] The United Nations Development Programme's 1999 report (UNDP, 1999) on decentralisation states this more precisely: "Decentralization, or decentralising governance, refers to the restructuring or reorganisation of authority so that there is a system of co-responsibility between institutions of governance at the central, regional and local levels according to the principle of subsidiarity, thus increasing the overall quality and effectiveness of the system of governance, while increasing the authority and capacities of sub-national levels.

3.1 Theory of Fiscal Federalism: An Outline

The theory of fiscal federalism assesses whether the expenditure decisions are set according to the right priorities and offers a cost–benefit analysis of centralization. Conventional fiscal federalism is understood as a constitutional system assigning fiscal powers –relating to *allocation, redistribution and stabilisation*- among different tiers of government, with a noticeable *decentralisation bias*. Inman and Rubinfeld (1997) summarize economic federalism as "preferring the most decentralized structure of government capable of internalizing all economic externalities, subject to the constitutional constraint that the central government policies be decided by an elected or appointed 'central planner'."

Fiscal federalism amounts to choosing the optimal allocation of revenue and spending powers across the different layers in a fiscal federation.[6] This results in a multi-level character of government: federal, state and local government and in the EU case an additional supra-national layer of government with much influence in particular concerning regulation (but not so much in terms of actual spending and taxation (budget of 1% GDP)).

Fiscal federalism has to confronts both efficiency and equity aspects. This concerns in particular the provision of public goods and taxation and intergovernmental transfers. In practice, this implies typically both centralized as well as decentralized designs of public goods provision, implying "local public goods," "state public goods," and "national public goods". The tax system is typically assigned in such a manner that local governments are mainly financed by user charges and "local" taxes, especially the property tax, and states by consumption taxes, with the income tax being left largely to the central (federal) government.

Fiscal federalism concerns both the design of public good provision and the tax system. The traditional framework for fiscal decentralization is clearly summarised by Oates (1999). The classic argument in favour of decentralization is that local governments are more efficient and responsive to the needs of citizens as well as being held to a higher level of accountability than national government structures. In spatial considerations, sub-national governments become a necessary conduit for setting up an efficient solution for equating benefits and cost. Assignment of functions in fiscal federation result from the "Decentralization Theorem". The magnitude of the welfare gains from such decentralization depends on several factors including the variation in demands across jurisdictions, jurisdictional cost differences, and the price elasticity of demand.

States can compete in the provision of public goods (quantity/quality) and also use tax competition between regions. Economic agents can choose the preferred combination of public

[6] An interesting question that is often raised is: will a federal state have higher growth than a comparable unitary state (a state that is characterised by uniform public good provision and uniform taxation): Empirical and theoretical studies find evidence/ provide reasons that federalism can indeed have beneficial effects on growth (see e.g Thiessen (2003)). Prohl and Schneider (2009) find for OECD countries, more decentralisation is associated with a smaller size of government. In addition, Shah (1998) finds for a set of 80 countries a positive relation between fiscal decentralization and the quality of governance indices, and concludes that decentralized fiscal systems offer a greater potential for improved macroeconomic governance than centralized fiscal systems.

goods and taxation by 'voting with their feet': but this can lead to both efficiencies and inefficiencies. Goodspeed (1998) underlined that "the horizontal tax competition can result in an efficient allocation of resources if the taxes used are benefit taxes. If taxes do not reflect benefits, however, Oates (1999) suggests that externalities are created so that tax prices diverge from social marginal cost".

A fiscal federation is characterised for a (latent) need for significant *intergovernmental grants* – i.e. transfers- to close revenue gaps left as a result of the efficiency -, equity – and stabilisation functions. This therefore implies redistribution of fiscal revenues from federal government back to the regions. Considerable attention has been devoted to the appropriate design of such grants, as well as to empirical analysis of their effects on local spending patterns. Transfer systems can be conditional or unconditional, open or closed, matching or non-matching. Transfers imply redistribution reflecting solidarity mechanism and also contain a stabilization element reflecting automatic stabilization/insurance to shocks function in a federation.

However, transfers also foster dependence, inactivity or "Mezzogiorno" problems. In addition, (soft) budget constraints, bail-outs and fiscal sustainability play a role: fiscal transfers may create moral hazard problems. Vertical fiscal imbalances in a federation have potentially disastrous consequences if such moral hazard problems are not tackled. In short: transfers in a federal systems are likely to result in a trade-off between risk-sharing and moral hazard: more transfers will foster risk-sharing but aggravate moral hazard problems.

Note finally that political federalism, -the more or less analogue to fiscal federalism- clearly adds an additional layer of complication by dropping the assumption that central governments are omniscient social planners. Rather, policymakers are primarily politicians in this framework, motivated by prospects of re-election, the "perks" of office (which could include private returns from its corrupt use), lobbyist contributions, and other factors in addition to (or instead of) general social welfare. Administrators at all levels may or may not have the capacity and power to enforce the policies they deem desirable. Policymakers may or may not have complete information for determining which policies are desirable. Political aspects of budgetary governance will be discussed more in detail in Section 4.

Oates (2005) distinguishes a recent wave of new fiscal federalism literature, the s.c. *second-generation theory of fiscal federalism* with broader perspectives that draws on fields outside public economics: principal-agent problems, the economics of information, the new theory of the firm, organization theory, contract theory and public choice. This new fiscal federalism literature extends the earlier results from the theory fiscal federalism –summarized above- to entirely new insights on centralization and decentralization in government and draw their implications for the structure of the public sector, fiscal institutions, and policy-making.

The traditional fiscal federalism relied on Pareto-principles in policy-making and ignored public-choice aspects: rather than optimizing, benevolent agents, public choice, however, considers that public agents can best be characterized as seeking to maximize the size of their budgets and other forms of private gains. In the second generation fiscal federalism, many efficiency

principles of the traditional fiscal federalism model, do no longer hold necessarily (or may in fact produce quite perverse results if adhered to/implemented).

New fiscal federalism is in fact based on two fundamental research insights. (i) It incorporates the theoretical and empirical work in *public choice* and *political economy* that focuses on political processes and the behaviour of political agents. Rather than maximizing social welfare, public officials are assumed to follow have their own objective functions that they seek to maximize in a political setting that provides the constraints on their behaviour. The political economy theory emphasises the common pool problem arising from politicians spending money from general tax revenues on targeted public policies. The group of those who pay for specific targeted policies (the general tax payer) is larger than the group of those who benefit from them. As a result, the net benefits accruing to the targeted groups and the net benefits for society as a whole diverge largely. This divergence induces the targeted groups and the politicians representing them to demand more spending on such policies than what is optimal for society as a whole. Thus, the common pool problem leads to excessive levels of public spending, deficits and debt if no adequate budget institutions are designed to tackle political economy aspects as emphasized by von Hagen and Harden (1994).

(ii) It also incorporates the literature on problems of information. In settings of asymmetric information, where some participants in public policy have knowledge of such things as preferences, cost functions, or effort, knowledge that is not available to other participants, optimal “procedures” or institutions are likely to be quite different from those in a setting of perfect information.

In this public choice/political economy and asymmetric information setting, one crucial result of the older fiscal federalism, the Decentralization Theorem will no longer necessarily hold: in the presence of ‘soft budget constraints’, the expectations of ‘bail-outs’ and other forms of risk-sharing, regional or local governments have the incentives to exploit the “fiscal commons” by effectively shifting the burdens of local programs onto the nation as a whole. Moral hazard and adverse selection problems will result in decentralized finance to be overly expansive as the burden of taxation is (expected to be) shifted onto residents of other jurisdictions. From this and other results, the new fiscal federalism literature concludes that perverse fiscal behaviour is essentially built into the system.

The new fiscal federalism literature is very relevant for the current EU: one of the fundamental challenges in the design of new European fiscal institutions will involve addressing asymmetric information and adverse incentive effects to avoid common-pool problems and other types of opportunistic efforts at decentralized levels that will tend to undermine budgetary sustainability at all levels. Safeguarding a federal governance system requires continuous efforts to counteract the various perverse incentives –both at the central and decentralized levels-. An important insight is that both a very weak central government and an overly powerful central force would undermine the delicate balance of powers in a federation and are likely to lead to failure in the end.

3.2 An application of fiscal federalism to the EU case: The EU budget and Eurobonds.

Spending in the EU budget is dominated by redistribution -mostly based on agricultural and structural programs. Large sums of money are transferred from the Member States to Brussels and back to the Member States. Only little is spent for union-wide public goods. Roughly halve of the EU budget is devoted to the Common Agricultural Policy and the other halve to the Structural and Cohesion Funds. Currently, the EU budget is mainly financed by two sources of revenues: revenues of customs and other levies and a contribution by Member States calculated on their respective standardized VAT base. The EU, thus does not have a real power to tax, nor much autonomy in raising funds. In addition, the EU is not allowed to issue debt.

Using criteria of fiscal federalism, Alesina, Angeloni, and Schuknecht (2005) employ quantitative measures to analyse the degree of EU involvement and to quantify the desirable allocation. Their conclusion is that there is a mismatch between the desirable EU involvement and the status quo on several fields.

Recent negotiations[7] about the *EU budget* for the 2014-2020 took place in the difficult conditions of the financial crisis and its fall-out, including very narrow budgetary space and economic slowdown. The European Commission proposed a budget for 2014-20 worth roughly €1033 billion in commitment appropriations (1.08 percent of EU gross national income). The negotiations were characterised by a deep division between a group of Member States that plead for an increase in the EU budget and increases in the scale and scope of EU policies and another group of Member States that envisages to curtail EU budget and policies. Not surprisingly, the division line between Member States revolves more or less between Member States that are net contributors and net receivers to/from the EU budget. Deltas and Van der Beek (2003a, b) model changes in inter-governmental net transfers as the result of key characteristics of a federation, such as changes in population and per capita income of constituent states, the composition of the federation, and changes in the decision making structure and apply this framework to the net transfers from the EU budget. It is found that basically two-thirds of the net transfers is explained by increases in cohesion policy measures, by deliberate policy therefore. The remaining one-third is explained by objective factors like population and changes in decision making structures.

Decisions on the EU budget are –like any other decision making on EU policies- the result of the complex decision making process of the EU. The complexity results from a delicate inter-institutional balance of power between the crucial players, European Commission, European Council and the European Parliament. Giuriato (2009) considers these interactions inside the EU institutions in the context of the formation of the EU budget using a game-theoretic approach and shows how the balance of power has shifted over time as a result of changes in the institutional framework. A second layer of complexity comes from the assignment of voting powers to Member States representatives and voting rules that are embedded in decision

[7] See European Council (2012) for details on the negotiations.

making. Using theories on coalition formation, voting rules and voting power, see e.g. Widren and Heinemann (2002) and several other studies have analysed the EU decision making process and changes in the relative power of individual Member States using power indices.

Aksoy and Rodden (2009) analyse how the relative overrepresentation of small Member States in legislative bargaining also helps to explaining budgetary outcomes which favour relatively small Member States in the budgetary allocation in the EU using a dataset that covers the period between 1977 and 2006. Overrepresentation of small states is most pertinent when all states have veto authority in the Council, and reduces when changes to the status quo require only a (qualified) majority like in the European Parliament. Since Unanimity rules still apply for a wide range of issues, the importance of small Member States is not to be underestimated. The relative benefits to small states in the process of EU legislative bargaining derives from models of vote-buying in the process of coalition-building. Vote-trading is enhanced by the fact that the salience of each issue varies greatly across countries, and member states are rather well informed about each other's preferences. Moreover, a small number of players interact repeatedly over a long period of time, which might encourage reputational sanctions or norms of mutual trust that help cement non-simultaneous vote-trading deals.

Given all these aspects, it seems necessary to many that reforms of the EU budget will be undertaken. Two political proposals for an EU budget reform have been made recently: the "Sapir Report" (Sapir et al., 2004) and the "Boege Report" (European Parliament, 2005). Both reports agree that a shift of spending from redistributive agricultural programs to public good provision would be welfare-enhancing. The Sapir Report demands that 45 percent of total spending should in the future be used for public good provision (especially in infrastructure and research), 35 percent for "industrial convergence" and only 20 percent for restructuring programs including agriculture. The Boege Report focuses more on changes on the revenue side. The most important demand is that the Member States shall co-finance 25 percent of all agricultural spending of the EU. If total spending of the EU remains stable, this should increase the room for EU spending on public goods.

A second example that illustrates the fiscal federalism in the EU is the recent discussion about 'Eurobonds'. The financial crisis caused substantial risk premia on sovereign bonds/speculation and contagion in euro area bond markets. This has in theory a potentially positive effect by disciplining governments that are not enough fiscally prudent (and rewarding those that do exert fiscal caution). In practice, however, if reflecting unfounded speculation such risk premia and contagion are not efficient and potentially detrimental. The presence of both positive and negative effects from bond markets in a monetary union has led to discussion of 'good' vs. 'bad' bond market equilibria. *Eurobonds*, i.e. a federalisation/mutualisation of sovereign bonds issuances –subject to conditions and constraints- could provide a straightforward exit from bond market turmoil in the euro area. Such a mutualisation or federalisation of debt issuance and the creation of a common sovereign bond market in the euro area would also be instrumental to other objectives in terms of economic and monetary union, fiscal union, banking union and political union.

The possibility of Eurobonds has been well-established by now and would constitute a crucial milestone from the fiscal federalism perspective. Several proposals for common euro area sovereign securities have been proposed that vary significantly in the various details, modalities of common debt issuance. See European Commission (2011) and Claessens et al (2012) for a detailed discussion of the different proposals. Claesens et al. summarize in Table 2 the potential benefits from Eurobonds –the European Commission uses the term Stability bonds to avoid any mixing up of fiscal stability and stability of the euro-:

Table 1 **Objectives of Common Debt Issuance**

Fiscal risk-sharing and fiscal discipline	
Fiscal risk-sharing	- monetary union requires some fiscal risk-sharing. This can be achieved through common debt in the form of ex-ante (borrowing cost and transfers) or ex-post (default) mechanisms - issuing debt jointly can reduce borrowing costs for currently stressed sovereigns, with gains at aggregate level
Fiscal discipline	- current methods of fiscal discipline have shown limits; common debt issuance with enhanced institutions and ex ante surveillance, and a better role for price signals could strengthen fiscal discipline
Financial stability	
Bank-sovereign loop	- home bias in sovereign debt holdings (that liquidity support measures (e.g., LTRO) may have increased) makes for perverse bank-sovereign links; common asset/pooling risks can reduce it
Provision of a safe asset	- when risk (perceptions) change, flight to quality leads to large, destabilizing changes in yields and capital movements; a large common safe asset can reduce these risks - with larger asset and better reserve currency, liquidity benefits can accrue to euro area and possibly help with global imbalances
Monetary policy transmission and financial markets' functioning	
Monetary transmission mechanism	-monetary policy transmission mechanisms are impaired; a unified bill/bond market can help restore them
Financial markets functioning	- financial markets are increasingly fragmented along national lines; a reduction in country risks and common bill/bond markets can help revive the benefits of financial integration

Source: Claessens et al. (2012)

Eurobonds can potentially serve two functions: in the short-term, stabilize financial markets and banks and, in the medium-term, help to improve the euro area economic governance framework through enhancing fiscal discipline and risk-sharing, and to improve monetary policy transmission and financial markets' functioning given a deepening of euro area bond markets.

Valuable insights can from adopting a fiscal federalism approach to budgetary governance in the EU. The recent European debt and economic crisis hints at the problems from an unfinished budgetary and governance framework. Two recent debate where fiscal federalism aspects

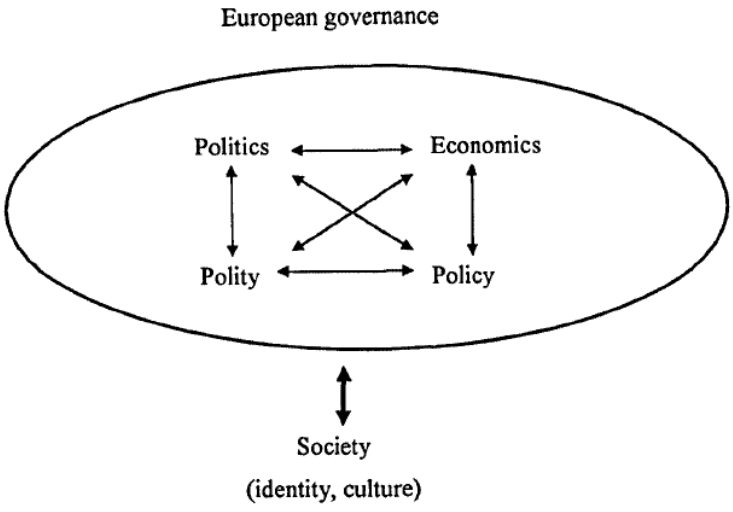
feature prominently are the debate on the EU Budget and on the potential introduction of Eurobonds.

4. A Public Policy and Political Perspective on Budgetary Governance: Multi-Level Governance and Open-Coordination and the EU.

The EU budgeting and governance framework is embedded in the general policymaking framework. Theories of governance, budgeting, public policy and political economy provide important insights in the political aspects of budgetary governance in the EU. Governance concerns the control of systems and the technologies by which control is achieved. Governance not only concerns government and policy but also the interaction between public authorities and non-governmental, functional actors like companies, trade unions and other associations. In democratic, market-based economies, regulation is the most important model of a control system. In regulatory frameworks, legal rules enable to set control norms and to delegate rule-making power to institutions or agencies that manage sub-systems. Monitoring functions can be implemented to detect and sanction deviations from rules and standards. Modern governance, -e.g. by EU institutions- is highly complex and fragmented. This explains also why governance reform in the EU is such a difficult and long-term process.

Schobben (2000) depicts the economic, political, juridical and social dimensions of the European governance process as follows:

Figure 3 **The European governance process**



Source: Schobben (2000).

4.1 Budgeting and Public Policy

The government budget reflects the means by which the objectives of government (and society for that matter) are achieved. *Public budgeting systems* have three primary purposes: control, management, and planning (Schick, 1966). Public budgeting is not only about accounting and financial management inside government; it also is about accountability and governance.[8] The budget can prioritize, allocate, economize, or control and otherwise "fit" the appropriate policy tool to the problem at hand.

Budget control is both budget formulation control and control in the budget execution process. Miller et al. (2001) assume a government budget control system having five major components: focus, estimation, scarcity, criteria, and choice. These components refer to the parts of the role played by guardians as they view the proposals of advocates in the formulation of the budget. These components are budget decision-making steps and are therefore components of a larger decision-making system. In this larger framework, policymaking at times dominates budgeting and at other times is dominated by budgeting.

Fiscal institutions (structures, procedures, laws, organizations) are also crucial in budget control: work by Poterba and von Hagen (1999) has provided many possible avenues for defining and measuring both institutions and estimating their effects.

Public budgeting has been studied from three perspectives: economics, management, and political science. Studies rooted in economics tend to focus on the nature of public goods and the allocative efficiency of the mix of goods and services provided by government. Various decision rules and allocation processes are examined for their relative utilities in this regard. Political scientists highlight the political dimensions of the resource allocation process, and the budget's role in the policy making process. The political perspective has been dominated by the theory of "incrementalism" which assumes that budgets change only marginally from year to year, and major reallocations can be costly and should be avoided in light of the state of knowledge regarding public sector policy issues; the resource allocation process is a fragmented, bottom-up process characterized by deference to substantive expertise and previous allocations. Wildavsky's (1964) model of 'incrementalist budgeting' therefore explains the government expenditure bias in budgeting from a 'incrementalist' mindset in bureaucracy. Finally, the organization-based approach to the development of budget theory focuses on how the nature of the public organization affects the resource allocation process and how the nature of the resource allocation process affects the operations of the public organization.

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[8] In most private organizations the primary instrument of management control is *responsibility budgeting*. In responsibility budget formulation, an organization's policies, the results of all past policy decisions, are converted into financial budgets and targets that correspond to the domains of administrative units and their managers. Under responsibility budgeting, work is arranged into administrative units according to mission, function, and/or region. An organization's administrative units and their relationships to each other—the structure depicted in organization charts—constitute its administrative structure. Responsibility budgeting requires authority and responsibility to be allocated to individuals within the organisation. This constitutes an organization's responsibility structure. Finally, responsibility budgeting requires a system of measuring and evaluating performance information on inputs, costs, activities, and outputs. This is the organization's account or control structure.

Political economy delivers several important additional insights on the budgeting process and outcomes. Niskanen's (1971) argument of the budget maximizing bureaucracy and administration points at the adverse incentives in government. He characterized bureaucrats as rational, self-interested, and monopolistic controllers of marginal cost and performance information; bureaus as monopolistic suppliers of services and inefficient budget maximizers; and legislatures as the sole buyers of the services. Niskanen's agency dominance perspective has been developed and respected by many advocates of public choice. Becker (1975) emphasises the importance of lobbying interest (pressure) groups in the budget process. Successful fiscal consolidation will therefore partially also depend on addressing these aspects and taking into account the political context.

Program, Performance and Outcome Budgeting

Program budgeting (Schick 1996) aims at rationalising policy-making by providing (i) data on the costs an benefits of alternative ways of attaining proposed public objectives and (ii) output measurement to facilitate the effective attainment of chosen objectives. Program budgeting is a planning oriented budget approach: the planning approach is organised by program rather than by department of fiscal input or output. From one perspective, program budgets more effectively align budget information with strategic objectives and illustrate the consequences of budget decisions. By grouping line items that attempt to achieve the same strategic objective into programs, the focus of senior decision makers moves from the narrow to the broad. Program budgets can thus serve four distinct (and sometimes complementary) objectives by: (1) facilitating a cost effectiveness comparison between alternative systems; (2) improving technical efficiency by providing discretionary authority to lower-level managers; (3) clarifying the life-cycle costs of decisions; and (4) structuring planning, programming, and budgeting decisions in a multi-year framework.

Program structure development thus has two distinct approaches. The first approach argues that programmatic classification should reflect policy objectives across organizational boundaries. The second argues that it should closely mirror the existing organizational structure. From the first perspective, the program structure should be the dominant classification serving as the basis for policy decisions and resource allocations. From the second view, conforming programs to existing institutional boundaries simplifies the program structure and aligns it with organizational incentives. Each outlook comes with a cost; for example, programs that span organizational boundaries have proven difficult to implement. On the other hand, programs constrained within organizational boundaries diminish the government's capacity to analyze and coordinate objectives that two or more ministries might share. Others have argued that classifying programs within organizations robs program budgeting of its essential purpose. Curiously, advocates of both approaches argue that the resulting program structure represents policy objectives.

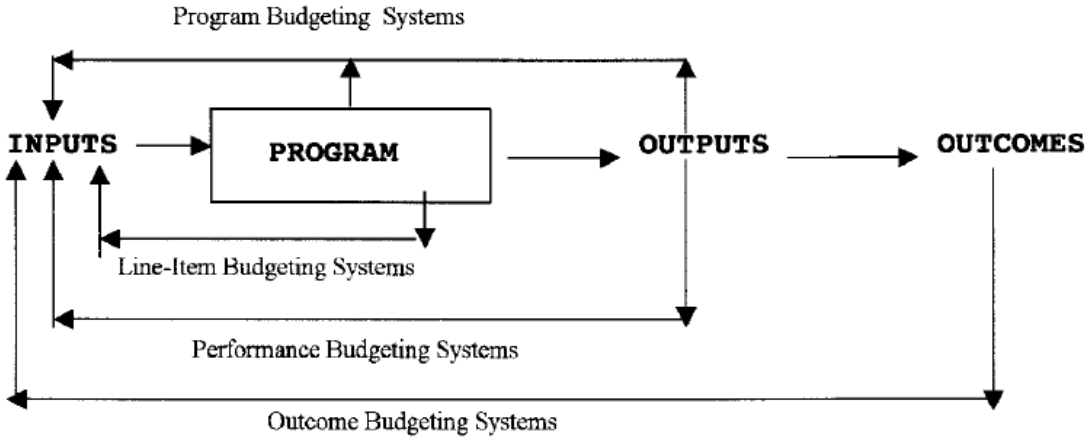
Recently, governments have begun to implement program budgeting based on the recognition that an organization's structure is a reflection of line ministries' policy objectives. Several Organization for Economic Cooperation and Development (OECD) members have reclassified

their budgets on the basis of programmatic criteria and have developed multi-year estimates for programs.

Performance budgeting presents government program input and output, thus allowing easy verification of the program's economy and efficiency". Osborne and Gaebler (1992) define *outcome budgeting* as: "A budget system that focuses on the outcomes of the funded activity".

Figure 2 compares these Public Budgeting Systems:

Figure 4 **Comparison of Public Budgeting Systems**



Budgeting System	Purpose	System Foci	Target Audience
Line-Item	Control	Inputs/Program	Internal
Performance	Management	Outputs/Inputs	Internal
Program	Planning	Inputs/Program/ Outputs	Internal/ External
Outcome	Outcome Performance, Transparency & Communication	Outcomes/Inputs	External/ Internal

Source: Osborne and Gaebler (1992),

4.2 Multi-Level Governance and Open-Coordination in EU Governance

Marks (1993) defined *multilevel governance* as: "a system of continuous negotiation among nested governments at several territorial tiers -supranational, national, regional, and local- as a result of a broad process of institutional creation and decisional allocation.' Multi-level

governance in policy and regulation therefore characterizes the complex and changing relationships in policy and regulation between actors situated at different territorial levels, both from the public and the private sectors.[9] It describes the systems of continuous negotiation among nested governments and other stakeholders at several territorial tiers and described how supranational, national, regional, and local governments are enmeshed in territorially overarching policy networks. Multi-level governance results in a multilateral negotiation game, in which redistributive and ideological conflicts have to be resolved/compromised and where several players possess veto-power.

Marks and Hooghe (2003) distinguish between Type I and Type II versions of multilevel governance. Type I resembles federal arrangements and intergovernmental arrangements and is characterised by general purpose jurisdictions, where functions are bundled, and there are multiple (but limited) levels of government within a system-wide architecture. Type II is characterised by functionally specific jurisdictions, operating at different territorial levels in a flexible manner.

While more and more scholars use the idea of multi-level governance, the concept itself remains ill-defined. In particular, it is not quite clear whether multi-level governance would increase or reduce the efficiency and effectiveness of policy-making in the EU. While it is often praised for advancing flexibility, plurality of actors and cooperation can create problems of over-complexity, blurring of responsibilities and the danger of stalemates with increasing number of veto-points in the multi-level structure of the EU.

Regional development policies in the EU are a good example of the use and usefulness of multi-level governance. Until the early 1980s, the prevailing approach to dealing with disparities between regions was redistribution. Central governments provided grants to attract firms to less developed regions and to support regional and local government investments in infrastructure. In an increasingly globalized economy, the theoretical justification and the practical effects of this policy became doubtful. According to new theories of regional economics, development is improved if regions focus on specific clusters of industries, implement strategies of flexible specialization and foster 'endogenous' potentials of locations. This regionalization imperative was supported by the European Commission.

At the outset European regional policy consisted of the allocation by 'Europe' of funds to national governments. However, in 1988, a reform introduced new implementation procedures for the structural funds. This reform created a process of multi-level policymaking, which is characterized by the following attributes: (i) The coordination of different structural funds, the European Regional Development Funds (ERDF), the European Social Funds (ESF), the guidance section of the agricultural funds (EAGGF) and the Cohesion Funds. The aim is to implement an integrated approach to policy-making. (ii) Grants to regions or firms are only provided on the basis of multi-annual programmes. Regions are obliged to elaborate

[9] See e.g. Rodrigo et al (2009), Marks (1993), Chowdury and Wessel (2012) and Scott (2002) for a detailed analysis of multi-level governance.

development plans, which include goals and key projects. (iii) Improvement in vertical intergovernmental coordination: the reform introduced the partnership principle which gives the regional actors an effective role in decision-making on the use of available regional policy grants. Subsidies to selected regions are granted on the basis of Regional Development Plans and Operational Programmes, which are elaborated at the national and regional level. (iv) All projects assisted by the EU have to be co-financed by national or regional governments. EU regional policy can be characterized as a system of joint finance, linking budgetary policies of different levels of government. In this way, EU grants mobilize money from national or regional budgets and direct it to regions in need. (v) The rules of the structural funds require (since 1993) that regional administrations should include private actors (economic and social partners) in the decision-making process in order to achieve broad support for policy goals and to gain comprehensive information on development potentials. The EU thus encourages the emergence of policy networks in the regions.

The *Open Method of Co-ordination* (OMC) was first introduced in the EU at the Lisbon Summit of March 2000. Its objective is not to prescribe uniform rules or to deliver policy outcomes as in the traditional EU governance framework. Instead, it organises a learning process in order to promote the exchange of experiences and best practices. It focuses on creating soft law mechanisms designed to achieve some convergence of results while permitting a diversity of national policies. A key role is played by a supranational actor: it seeks to coordinate national policies through a system of benchmarking, best practices and recommendations. In other words it does not reduce power at the national level empowers the European institutions with very specific tasks central to the whole process. Not withstanding the potential advantages and benefits, the OMC raises many questions: how to measure outcomes and indicators, or e.g. efficiency of structural policies, when is benchmarking an adequate incentive scheme, how to define 'best practices' and how to relate to them, how to deal with steering problems etc.?

Related to OMC's are the Enhanced Cooperation Agreements (ECAs) that enable subsets of Member States to go on with integration on some particular issue, following ex ante agreed upon decision and governance rules. These sub-unions have been introduced with the Amsterdam Treaty and further regulated by the Treaty of Nice.

The EU budgetary governance framework needs to be oriented more towards the actual budgeting processes and the political context in which it takes place. It is moreover likely that principles underlying governance may change over time, in particular a change from traditional nation states 'command and control' is likely to forms of multi-level governance and open-coordination approaches.

5. A Systems Design and Control Perspective on Budgetary Governance: Dynamic Hierarchical Control and the EU.

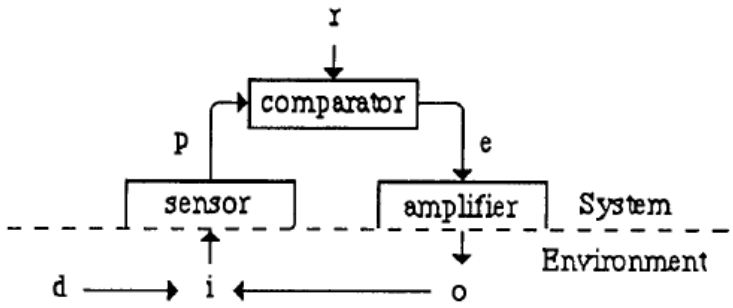
One of the major weaknesses in the existing budgetary governance framework in the euro area appears to be a lack of effective monitoring, timely and systematic diagnosis and evaluation and implementing consequent feedback-control mechanisms when considered necessary. The existing governance framework also does not recognize the essentially network-based character of budgetary management in a supranational setting with 27 highly integrated Member States. While realising the complexity of the euro area economy, it appears that control and systems theory could provide valuable principles in budgetary management in the form of applications of its tools and concepts, in particular in a setting of hierarchical relations and network structures.

5.1 Control and Systems Theory: An Outline

Control and systems theory analyses complex causal relations in physical and technical systems, think e.g. of a nuclear plant in the course of producing electricity. It is crucial that the managing engineers remain in control of all systems not only under small disturbances where the systems behave in a approximately linear manner but also in the presence of larger disturbances where nonlinearities may start to drive the system and systemic risk is present. With the use of analytical and numerical methods, control theory seeks to derive impulse-response functions on which control strategies can than be designed according to certain efficiency or utility criteria for performance evaluation. *Block-diagrams and Signal-Flow graphs* are the graphical representation of the systems and their operating. The *Transfer Function* describes the relation between inputs and outputs (or “signals”) of the system, taking account the *controllability and observability* characteristics of the system. The *Impulse Response Function* describes the effects of a unit pulse on outputs of the system. A *state-space* representation of the system, finally, gives a complete description of the system at a given time and its transition from one state to another. *Stability, robustness and internal and external stabilizability* are important performance measures of the system. *Feedback control* designs control strategies as feedback on states of the system.[10]

[10] In case of a linear systems all these aspects are essentially well defined and implementable. In a nonlinear system, these aspects are much more complicated and phenomena like multiple equilibria, path-dependency and chaotic dynamics may be present. To the extent that a nonlinear system is only a small distance from equilibria, a linearization of the nonlinear system around equilibrium may be adequate. Arguably, the current financial crisis represents a large shock and approximating the adjustment towards equilibrium with the use of linear approximations of otherwise nonlinear models seems rather dubious.

Figure 5 **Basic Control System**



Source: Levine (1996).

The components of a basic control system are shown in Figure 4. The sensor converts an input variable, i, into a perceptual signal, p. The comparator subtracts the perceptual signal from a reference signal, r, to produce an error signal, e. The amplifier converts the error signal into an output variable, o. Signals are quantities that vary inside the control system; variables are quantities that vary outside the control system. What constitutes an input and an output variable depends on the location of this basic system in a *control hierarchy*. If the system is at the lowest level of the hierarchy, then input and output are physical variables in the environment. If the control system is higher in the hierarchy, then input and output are signals coming from and going to lower level control systems; the lower level systems are the "environment" of the higher level systems. Regardless of their position in the hierarchy, all control systems are designed to do the same thing-keep the input variable, i, in a predetermined state specified by the reference signal, r. The problem of control arises because the value of the input variable is affected by system outputs as well as *disturbances*, d. A disturbance is any external influence on the input variable that is not caused by the system itself. When set up properly, a control system produces outputs that counteract the effects of disturbances on the input. The input variable, which is maintained at a value that corresponds to that specified by the reference signal, is called the controlled variable. The value of the input that corresponds to the setting of the reference signal is the reference state of the controlled variable. The reference state is constant if the reference signal is constant, and it varies if the reference signal varies. However, constant or varying, the controlled variable is kept in the reference state, continuously protected from the effects of disturbance by the output of the control system.

Network structures that connect many or all nodes of an organization are interacting in disseminating and sharing (almost continuous) flows of information in the network.[11] Object-Oriented Modeling models the interconnections of systems by considering: knowledge encapsulation and interface points, topological interconnections, hierarchical connectedness,

[11] For a much more detailed introduction to control theory and networks systems, the reader is referred to handbooks on control theory, see e.g. Wolf (1974), Marko (1977), Strang (1986) and Levine (1996). Examples of applications include e.g. Rohloff et al (2004) on dynamic resource allocation.

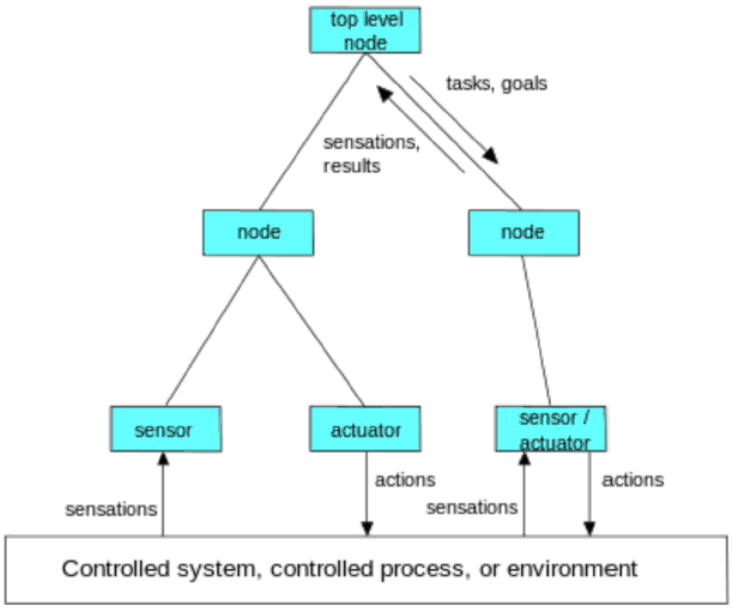
object instantiation, class inheritance and generalized network capabilities include nodes that offer variable number of connections to them.

The complexity of aggregate systems and their behaviour –think e.g. again on the operating of a nuclear power plant- is in particular fostered by the presence typically of different layers of smaller systems, processes with their own dynamics and organisation whose actions are controlled by hierarchical relations; i.e. creating networks of systems. *Hierarchical control*[12] is accordingly defined as: "The organization of controllers in a large-scale system into two or more levels so that controllers in each level send control signals to controllers in the level below and feedback or sensing signals to controllers in the level above. Also known as control hierarchy." (McGraw-Hill Science & Technology Dictionary).

Jones and McLean (1986) use hierarchical control to develop a generic model of fully automated and integrated manufacturing systems in the form of a generic architecture for real-time production control.

A human-built system with complex behaviour is also often organized as a hierarchy. For example a command hierarchy like an army has among its notable features the organizational chart of superiors, subordinates, and lines of organizational communication. Hierarchical control systems are organized similarly to divide the decision making responsibility. A "tree diagram" summarizes the operating of such a hierarchical control system:

Figure 6 **Hierarchical control systems**



Source: Findeisen (1980).

[12] See Wilson (1979) on the principles of hierarchical control.

Each element of the hierarchy is a linked node in the tree. Commands, tasks and goals to be achieved flow down the tree from superior nodes to subordinate nodes, whereas sensations and command results flow up the tree from subordinate to superior nodes. Nodes may also exchange messages with their siblings. The two distinguishing features of a hierarchical control system are related to its layers. Each higher layer of the tree operates with a longer interval of planning and execution time than its immediately lower layer.

The lower layers have local tasks, goals, and sensations, and their activities are planned and coordinated by higher layers which do not generally override their decisions. The layers form a hybrid intelligent system in which the lowest, reactive layers are typically automated. The higher layers, having relaxed time constraints, are capable of reasoning from an abstract world model and performing planning. A hierarchical task network is a good fit for planning in a hierarchical control system. Besides artificial systems, an animal's control systems are proposed to be organized as a hierarchy. In perceptual control theory, which postulates that an organism's behaviour is a means of controlling its perceptions, the organism's control systems are suggested to be organized in a hierarchical pattern as their perceptions are constructed so.

5.2 Control and Systems Theory: Application to Fiscal Governance in the EU

In a stylized manner, the EU can be considered as an interesting example of a hierarchical control framework. The local-, regional-, and national economies and government budgets can be seen as interconnected subsystems that are governed/controlled by the respective policymakers that decide on the use of policy instruments under their control given their objectives and constraints, including requirements imposed from higher level hierarchies. Iterative information flows enables the policymakers to implement feedback controls and to connect with other subsystems and communicate to higher levels in the systems hierarchy. The EU control system is moreover changing over time as subsystems become more integrated, regulation and decision making competences change. At the aggregate level, the highest level of the hierarchy, the European Union as a supranational authority would act as an overall coordinator.

Weeren (1995) considers hierarchical control from the perspective of cooperative and non-cooperative strategies: players/different systems in the hierarchy may/ or may not be cooperative when acting. Clearly, a non-cooperative mode of control leads to inefficient outcomes as players do not incorporate the externalities relating to their actions on other actors. A cooperative mode of interaction does enable to internalize these externalities thereby improving upon outcomes in a non-cooperative mode of play. With more subsystems/players, the hierarchical control problem clearly becomes more and more complex, and also the need for adequate feedback control at the higher levels of hierarchy increases. In the non-cooperative mode also adverse incentive effects increase with increasing complexity as externalities fro m players' action and adverse incentive effects tend to increase.

Budgetary governance in the EU is different from management of nuclear plants or automated manufacturing systems. Control and systems theory, nevertheless, has many relevant and interesting insights relating to design and control of large scale network systems. Hierarchical control theory has potentially valuable insights for EU budgetary governance by taking into account control issues relating to hierarchical relations. These lie in particular in seeking to develop automated control systems that help policymakers at the EU and national level to control budgetary flows and process outcomes.

6. A Macro-Finance Perspective on Budgetary Governance: Budgetary Stress Testing, Budgetary Spillovers, Budgetary Resilience and Budgetary Early Warning Systems in the EU.

Europe's recent financial, budgetary and economic crisis has forcefully shown that macroeconomics, public finance and finance are intrinsically linked and need to be treated likewise in budgetary governance. Recently, more interest is observed on integrating macro and finance in budgetary governance. To do so, complex methodologies concerning budgetary stress-testing, budgetary early warning systems and budgetary resilience need to be developed and integrated into the budgetary governance framework.

6.1 Macro-Finance Aspects of Budgetary Governance: An Outline

In an early assessment of the financial crisis, the EU Commission (2009) called for a coordinated framework for crisis management that contributes to three issues: (i) *Crisis prevention* (in particular policies to boost potential economic growth and competitiveness could also bolster the resilience to future crises). (ii) *Crisis control and mitigation* (its main objective is to stabilise the financial system and the real economy in the short run. It must be coordinated across the EU in order to strike the right balance between national preoccupations and spillover effects affecting other Member States). (iii) *Crisis resolution* (its objective being to bring crises to a lasting close, and at the lowest possible cost for the taxpayer while containing systemic risk and securing consumer protection. This also relates to reversing temporary support measures – i.e. an orderly exit strategy- as well action to restore economies to sustainable growth and fiscal paths).[13]

The European Commission has recently analysed possible tools to strengthen its capacity to detect fiscal distress in member states. E.g. in its 2011 report on Public Finances in EMU (EU Commission 2011), four possible approaches are proposed: (i) a model that investigates the

[13] Crisis detection is possibly to be added as a separate issue as it is by no means easy to identify crises as they evolve in real time. With the benefit of hindsight it is always easier ex-post to single out crises moments of course.

potential impact of the balance situation of banks on public finances based on a value-at-risk analysis; (ii) *an early warning tool* which determines thresholds of fiscal distress for a set of fiscal and financial-competitiveness variables based on the signalling approach; (iii) an estimation of country-level *fiscal reaction functions* in order to evaluate the feasibility of fiscal consolidation programmes; (iv) a general equilibrium approach that identifies governments' maximally collectable tax revenue by taking into account the *feedback effects* between consolidation measures on the revenue side and the economy.

So far, policy makers in Europe have had no choice but to employ the existing mechanisms, models and procedures. However, the existing framework for financial crisis prevention, detection, control and mitigation appeared, with hindsight, to be underdeveloped. The beginnings of an improved, more elaborated framework are therefore emerging currently, building on existing methods, institutions and legislation, and complemented by new initiatives, as outlined above.

Although some observers pointed to large global unbalances before the crisis, hardly anyone could have predicted the timing and size of the current crisis. The failure to predict the crisis and its further spreading can at least partly be explained by the lack of adequate economic models. Existing models failed to, first, predict the moment of the crisis and secondly, the way in which the crisis affected various countries. Current well-established economic models appeared to be neither able to predict the impact of major shocks nor to distinguish between shocks and the transmission of shocks across countries via various channels, in particular due to the presence of real and financial spillovers.

Therefore, parallel to changes in macroeconomic policies, also in the analytical toolbox substantial investments are needed: standard macroeconomic models – even if upgraded to highly sophisticated DSGE models[14]- are not well-suited/designed to analyse the financial crisis and its effects in the Euro area. One needs to rethink the longstanding economic paradigm and its well-accepted models. A new and alternative approach, that captures the insights derived from the ongoing financial-economic crisis, has to be developed. In particular for the European Union with its complex governance structure, divergent macroeconomic performance and various spillovers, developing such an alternative is challenging.

Such a new approach needs a *comparative perspective.* Since the European crisis has affected European Union Member States sometimes in similar, sometimes in quite different ways, a comparative perspective is to be preferred over a single-country analysis. The awareness that a comparative perspective is necessary for systematic and consistent policy analysis and policy advice, is also witnessed by more attention to comparative aspects in many EU policy strategies and analyses, a good example being the recent introduction of the Macro-Economic Imbalance Procedure.

For a proper analysis of the incidence of the crisis, a clear separation between *shocks and transmission of shocks* is important. In this manner one is able to distinguish between causes

[14] See e.g. Smets and Wouters (2007) for the state-of-the-art DSGE model.

and effects, to carry out adequate policy analysis and to formulate appropriate policy recommendations. The distinction between shock and transmission is also clearly made in the methodologies of theoretical and empirical macroeconomics.

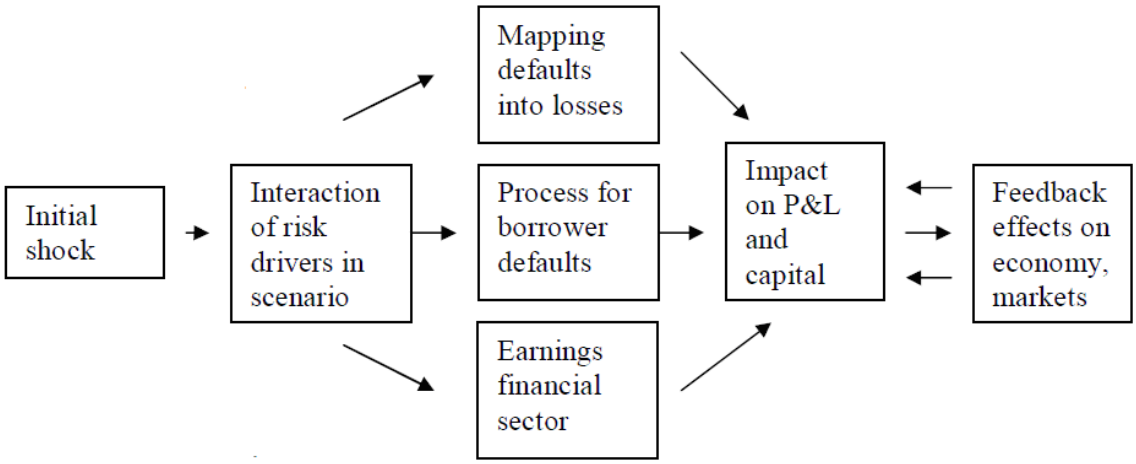
The global financial crisis and European debt crisis demonstrate the importance of *interlinkages* between countries in the transmission of shocks. *Macroeconomic spillovers* can take multiple forms: traditionally *trade-based spillovers* have been in the focus of interest. The current crisis has also highlighted the importance of *financial market spillovers and contagion* e.g. in the rapid spreading the initial shock in the US through global financial systems, in particular through interbank loan markets (see e.g Upper (2007)). Another demonstration of the importance of these spillovers, is the spillover of the Greek sovereign debt crisis to other peripheral euro area countries, via bond markets (see e.g. Afonso et al. (2012)).

In the aftermath of the current economic and financial crisis, economists, policymakers/regulators and the financial sector are realising that there is a need to make *stress-test methodologies* a systematic element in analysis and decision-making.[15] Macro-economic stress test models analyse the effects of macroeconomic "stress" on corporate sector default rates, and on banks' credit risks that would stem on their turn from such corporate sector defaults and also the effects of deteriorating systemic risks and other adverse macroeconomic factors. Stress-tests seek to predict the impact of major negative shocks on financial sector profitability and lending. Financial sector distress has on its turn also clearly macroeconomic implications as the recent crisis has shown.

Systemic and macroeconomic risks in the financial systems and their potential consequences, therefore, are receiving more attention and the occurrence of large and persistent negative macroeconomic shocks and their effects are given much more consideration. In this vein, Hollo et al. (2012) provides an overview on stress-tests for the European financial system and constructs the ECB's Composite Indicator of Systemic Stress (CISS). The IMF (Cardarelli, Elekdag and Lall, (2009)) has developed a financial stress index (FSI) as an approximation to potential instability of financial markets. In an analogous manner, budgetary stress test show the impact of large, negative macroeconomic shocks on budgetary stability.

[15] See also Chan-Lau (2006) for details on designing stress-tests.

Figure 7 **Stress-testing framework**



Source: Bank of England

Related to stress tests, *early warning systems* (EWS) play a prominent role in both the academic literature and in practical policies to anticipate financial crises. One of the most simple and widely used methods to construct early warning systems is the signals approach developed by Kaminsky and Reinhart (1999). It assumes a strong non-linearity in the relationship between indicator variables and financial crises. Indicator variables send a signal, if their level crosses a certain threshold. The signal is interpreted as a sign for a looming crisis that can be expected to emerge within a predefined period of time. Clearly, the choice of adequate thresholds is of crucial importance. If thresholds are set too high, looming crises might be overlooked (Type I errors). If thresholds are set too low, false alarms might be produced (Type II errors).[16]

Especially interesting in the context of this paper is the European Commission's Scoreboard of Macroeconomic Imbalances. It is based on a set of thresholds: Current account balance: Above +6% or below -4%, International investment position: -35%, Real effective exchange rate: -/+5% for euro-area countries, -/+11% for non-Euro-area countries, Export market shares: -6%, Unit labour costs: +9% for euro-area countries, +12% for non-euro-area countries, House price index: +6%, Private sector credit growth: +15%, Private sector debt: 160%, Public sector debt: 60%, Unemployment rate: 10%. It seems interesting to have a closer look at the performance of this EWS in the context of the financial and economic crisis.

[16] An early warning system thus can have four potential results: first, a signal is issued and a crisis follows (State A); second, a signal is issued and no crisis follows (State B); third, no signal is issued and a crisis follows (State C); fourth, no signal is issued and no crisis follows (State D). States A and D are the desired results; State C constitutes Type I errors; State B constitutes Type II errors. Thus, C/(A+C) is the share of Type I errors in pre-crisis periods, while B/(B+D) is the share of Type II errors for tranquil periods. The thresholds are set in a way that optimizes the forecasting performance within a sample. In most of the earlier contributions, the forecasting performance has been optimized by minimizing a noise-to-signal ratio (e.g. Kaminsky and Reinhart, 1999). In Demirgüç-Kunt and Detragiache (2000) and more recent contributions thresholds are set in a way that minimizes the weighted sum of two potential forecasting errors.

Resilience is another important concept for macroeconomic and budgetary governance in the presence of large shocks: it has been used mostly in ecology where it refers to the ecological capacity to withstand and to absorb shocks.[17] In economics, resilience is not a standard concept. The recent financial and economic crisis suggests however that the resilience to shocks could be an important feature to understand how economies reacted to the turbulence of global financial shocks and continue to diverge in adjustment dynamics in the transition phase after the crisis. Resilience can explain how the economy is impacted by shocks and how fast it will recover from the shocks. Budgetary resilience measures how much government spending and revenues are affected by large negative shocks by looking to impact and transmission effects. Among the many factors that can contribute to resilience a number of categories can be identified: (i) variables measuring policy variables (in particular monetary policy and fiscal policy), (ii) variables measuring constraints for policy action (in particular public debt and external debt), (iii) variables measuring short-term trade or financial flows that can affect short-run post-crisis recovery (e.g. FDI, exports and portfolio investment flows), (iv) variables measuring other factors, like reforms and structural changes that affect adjustment capacities (e.g. IMF arrangements and ESM support, labour market reforms).

Interestingly, a few studies have made the resilience concept more concrete in case of macroeconomic shocks, see especially Deserres (2007), Guay and Pelgrin (2007) and Duval and Vogel (2007). All studies use SVAR models to determine resilience. Deserres (2007) and Guay and Pelgrin (2007) use the impulse-response functions to shocks of different countries to compare the resilience against shocks of countries.

The financial crisis clearly requires new thinking about crisis-related economic phenomena like shocks, transmission and spillovers. At the same time, previously developed, but so far less important methodologies become important building blocks in a renewed macro-economic thinking. However, the current literature is rather fragmented. Various methodological aspects are well covered, but so far no attempts have been made to integrate these different elements into one methodological approach.

6.2 A Macro-Finance Approach to Budgetary Governance in the EU

This section outlines a methodological toolbox which can be used to analyse and compare the impact of actual as well as potential macroeconomic shocks in various EU member states, in the context of the current financial, budgetary and economic turbulence.

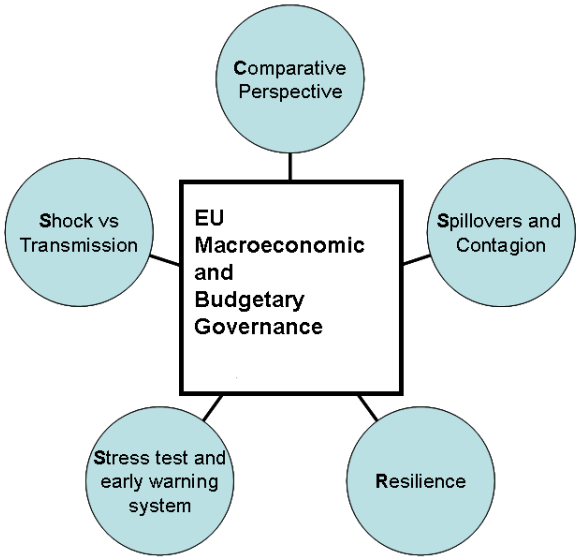
[17] A related concept is *vulnerability* to shocks which takes a more or less opposite perspective as resilience. Briguglio et al. (2007) define vulnerability in terms of inherent features and resilience in terms of policy-induced changes. Vulnerability would refer to permanent (or quasi permanent) features over which a country can practically exercise no control and therefore cannot be attributed to bad governance. Scores on resilience would reflect to some extent also the appropriateness of policy measures. Vulnerability and resilience indexes are constructed. The *vulnerability index* is linked to high degrees of economic openness, export concentration and dependence on strategic imports. The *resilience index* is linked to macroeconomic stability, microeconomic market efficiency, good governance and social development.

The analysis of the current European economic and budgetary crisis requires a multi-faceted approach towards analysing crisis impact and transmission. It needs to integrate into one framework, several aspects and tools that have proven their own importance/merits in analysing financial and macroeconomic adjustment. Due to the crisis various long-standing methodologies are indeed in need of an update –be it at the methodological front or in their application in the context of the recent experiences with financial market turbulence and economic slowdown-. New evidence and additional insights are therefore be expected from this integration. In this section we provide a brief state of the art on a few aspects that are important in the project design.

Budgetary governance would benefit from an integrated analytical framework that enables to analyse events like the recent financial crisis and economic slowdown in the EU by integrating the following aspects: (i) it takes a Comparative perspective; (ii) it enables to systematically identify Shocks versus the transmission of shocks; (iii) it takes systematically into account the presence of real and financial Spillovers in EU economies; (iv) it integrates Stress test models and early warning systems methodologies into macroeconomic analysis to detect, predict and explain stress in fiscal balances, financial markets and the real economy; (iv) it analyses factors that contribute to Resilience, to budgetary, financial and real economy stress factors, by considering the comparative EU evidence on institutions and institutional reforms.[18]

Figure 8 gives a graphical presentation of a budgetary governance framework in the EU in the context of financial crisis.

Figure 8 **An Analytic Framework of Governance in the EU**



[18] Related proposals and recommendations are also found in Kastrop et al. (2012), Kenny (2011), IMF (2009), Gray et al. (2008),

A crucial innovation of this approach consists of the integration of five research aspects into one overarching framework to analyse macroeconomic adjustments and governance in the context of the recent economic and financial crisis. This approach is likely to lead to more insights into the onset and evolution of the European crisis and also to insights that cannot be gained when one would restrict to one aspect only.

A macro-finance finance framework that embeds aspects such as spillovers, stress-testing, early warning and resilience, will constitute a valuable tool in EU budgetary governance in particular in a context of large shocks an (systemic) imbalances. Several promising approaches have recently been approached, inspired by the current crisis.

Conclusion

This paper has indicated approaches that could contribute to transform budgetary governance in the euro area from the current ad-hoc -, procedural -, indicator and rule based, approach to a integrative, process-oriented, diagnostic and self-correcting framework. Such an approach seems not only more effective in dealing with imbalances but also logical/required in an evolution towards economic -, fiscal-, monetary and bank-, social -, and political union (if this is the direction the euro area would decide to take). If the financial, budgetary and economic crisis has also positive aspects, it must be that it has contributed to a greater awareness of and insights into the needs to and benefits from reforming governance structures.

We surveyed the recent reforms to the existing budgetary governance framework. Changes to the Excessive Deficit Procedure and new instruments like the Macroeconomic Imbalance Procedure appear to be relatively small steps forward compared to the challenges ahead. .

Next, we considered a number of theoretical approaches that take fundamentally different perspectives on EU budgetary governance. We tried to demonstrate how these approaches could benefit to strengthening EU budgetary governance. Fiscal federalism focuses on the economic principles of government organisation, budgeting, and the assignment of allocation -, redistribution - and stabilization functions across different layers of government. EU budgetary governance would benefit from aligning it closer to the fiscal federalism. As concrete illustrations we took a closer look at the EU budget and the possible introduction of Eurobonds.

Theories from political science and public policy can also be highly relevant for EU budgetary governance. Our conclusion from outlining a few budget approaches and the framework of multi-level governance was that the EU budgetary governance framework needs to be oriented more towards the actual budgeting processes and the political context in which it takes place.

Managing a nuclear power plant, an army or other complex systems is clearly very different from managing EU budgetary governance framework. Nevertheless, we found that control and systems theory could provide useful principles, e.g. in providing concepts to deal with complex hierarchical systems, delineating information flows in large-scale control networks, automating of control processes in real time, considering stability and robustness aspects etc.

Finally, Europe's financial, budgetary and economic crisis has shown the need to add more diagnostic tools to the EU budgetary governance framework. A macro-finance finance framework that embeds aspects such as spillovers, stress-testing, early warning and resilience, will constitute a valuable tool in EU budgetary governance in particular in a context of large shocks an (systemic) imbalances.

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Project Information

Welfare, Wealth and Work for Europe

A European research consortium is working on the analytical foundations for a socio-ecological transition

Abstract

Europe needs change. The financial crisis has exposed long-neglected deficiencies in the present growth path, most visibly in the areas of unemployment and public debt. At the same time, Europe has to cope with new challenges, ranging from globalisation and demographic shifts to new technologies and ecological challenges. Under the title of Welfare, Wealth and Work for Europe – WWWforEurope – a European research consortium is laying the analytical foundation for a new development strategy that will enable a socio-ecological transition to high levels of employment, social inclusion, gender equity and environmental sustainability. The four-year research project within the 7th Framework Programme funded by the European Commission was launched in April 2012. The consortium brings together researchers from 33 scientific institutions in 12 European countries and is coordinated by the Austrian Institute of Economic Research (WIFO). The project coordinator is Karl Aiginger, director of WIFO.

For details on WWWforEurope see: www.foreurope.eu

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