



**FIRSTRUN – Fiscal Rules and Strategies under Externalities and Uncertainties.**  
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### **Summary report of the FIRSTRUN project**

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## Executive Summary

FIRSTRUN, or Fiscal Rules and Strategies under Externalities and Uncertainties, is a Horizon 2020 project that has investigated fiscal policy coordination in the EU. This report provides a brief overview of the project and its key findings.

One important research theme of the project has been the effects of cross-country spillovers from economic policies. In addition to spillovers from changes in the level of government spending or taxation, which influence aggregate demand, the project has studied spillovers from “structural fiscal policies”, such as pension reforms, which influence the supply side of the economy.

Both the empirical and model-based results are in line with the view that during “normal times”, fiscal spillovers from changes in the level of government spending or taxation are relatively small. However, spillovers may be much larger during “crisis times”, when the borrowing of many households is constrained and when monetary policy is also possibly constrained by the (effective) zero lower bound. Spillovers also increase when national fiscal policies are coordinated. These results underline the importance of fiscal coordination under special circumstances.

Certain structural reforms also have non-trivial spillover effects via international capital markets. These spillovers do not necessarily require policy coordination from the efficiency point of view, but they do have redistributive implications, e.g. their effects on the extent to which capital market integration benefits different countries.

A related issue is how exactly fiscal policies should be coordinated in a currency union to stabilise output growth and maximise average welfare. The analysis, based on a two-country DSGE-model characterised by country-specific price rigidities and distortions, suggests that the optimal solution would be to use fiscal policies to reduce net export gaps. This result stems from country-specific nominal price rigidities, which imply destabilising fluctuations in the terms of trade over the business cycle.

Another stabilization mechanism relates to cross-country risk-sharing. The FIRSTRUN project has considered private and public risk-sharing mechanisms and compared cross-country risk-sharing in the Economic and Monetary Union (EMU) to risk-sharing across states in the United States. The results show that there is still relatively little cross-country risk-sharing via private capital markets in the EMU. One reason for this is that the cross-border ownership of productive assets remains very limited.

The project has also paid close attention to what is known as “real-time uncertainty”, i.e. uncertainty about the current state of the economy. Real-time uncertainty appears to be very relevant for fiscal policy, because it is particularly difficult to distinguish between cyclical and structural components in economic growth in real time. As a result, the first estimates of variables such as the output gap or the structural deficit, which are key variables to consider when setting the stance of fiscal policy, are often later substantially revised. This has important implications for the optimal fiscal policy as well as the implementation of various EU fiscal rules.

A large part of the FIRSTRUN research was dedicated to evaluating the new, enhanced framework of EU fiscal governance. For example, the approach has been to consider how the new fiscal rules would have constrained fiscal policies during past economic booms and busts. Such analysis requires a clear and comprehensive view of the information that was available at the time the rules would have been applied.

In this regard, one of the main results is that the use of the structural deficit for steering fiscal policy tends to lead to pro-cyclical fiscal policy. Essentially, this is because the output gap method used to assess the structural deficit has a very limited capacity to track cyclical changes in real time.

The project also considered alternative measures for estimating the structural balance, such as the expenditure rule used in the preventive arm of the Stability and Growth Pact (SGP) and the so-called bottom up assessment method used in the corrective arm. The results show that at least in the past, these methods would have been conducive to better fiscal policy than the output gap method.

In a similar vein, FIRSTRUN researchers analysed whether the Macroeconomic Imbalance Procedure (MIP) would have been able to detect increasing macroeconomic risks prior to the 2008 financial crisis and the subsequent recession. The results show that the MIP would have provided moderately useful alerts in terms of crisis prediction before 2009. However, many of the indicators, especially those related to the financial markets, would have been uninformative. This suggests that the MIP Scoreboard could be simplified.

The project also dealt with political and institutional aspects of EU fiscal governance. It raised concerns regarding the erosion of democratic legitimation in EU fiscal governance. Given that fiscal policy has more direct distributive consequences than other areas of policy which have become more technocratic, this may undermine the implicit contract between voters and national governments. In addition, public trust in decision-makers has been shaken. The concept of throughput legitimacy – validating how the EU level decides on the policy demands to be made on member countries – is suggested as one dimension of legitimation to be explored.

Finally, the project has produced new tools in the form of quantitative economic models for designing fiscal policies and developing fiscal coordination mechanisms in the EU.

## Introduction

FIRSTRUN, or Fiscal Rules and Strategies under Externalities and Uncertainties, is a Horizon 2020 project that investigates fiscal policy coordination in the EU. This report provides a brief overview of the project and summarise what its most policy-relevant results. It also describes new methods developed within the project, such as applied economic models, that should be helpful in designing fiscal policies under different circumstances and developing fiscal coordination mechanisms in the EU.

The results are structured around the following six themes: fiscal spillovers, risk-sharing, real-time uncertainty, fiscal rules, political economy and institutional challenges and tools for policy analysis.

By fiscal spillovers, we mean the influence of national fiscal policy measures on other countries. In addition to spillovers from changes in the level of government spending or taxation, we consider spillovers from “structural fiscal policies”, such as pension reforms, which influence the supply side of the economy.

Cross-country risk-sharing distributes economic shocks across countries, thereby disconnecting domestic consumption from domestic income. We present new results related to both private and public risk-sharing mechanisms in the Economic and Monetary Union (EMU) and compare risk-sharing in EMU to risk-sharing across states in the United States.

Real-time uncertainty refers to the fact that we often possess imperfect knowledge of the current state of the economy. It is particularly difficult to distinguish between the economic cycle and trend. It turns out that this has major implications for fiscal policy.

As for the fiscal rules, the project has focused on the enhanced Stability and Growth Pact. We have studied, for instance, how real-time uncertainty affects the workings of the fiscal rules.

The project has also examined the political economy of fiscal coordination and the related institutional challenges. Our work on this topic is partly based on the reports and the flows of information between the EU and the member countries as well as case studies of member state implementation of EU fiscal coordination.

Finally, the project has developed new quantitative economic models (and extended existing models), which should be helpful in designing better fiscal policies and coordination mechanisms in the future.

For brevity, we refer here only to deliverables as well as other reports and articles that make up the project’s output, organised around six main themes mentioned above. References to the related literature can be found in the research papers. FIRSTRUN deliverables and research reports can be downloaded at <http://www.firstrun.eu/research/>.

# 1 Spillover effects

## *Fiscal spillover multipliers*

A common rationale for fiscal coordination is the existence of cross-country fiscal spillovers together with market imperfections or frictions (Alcidi et al., 2015). In order to design effective policy coordination, however, it is crucial to have a good understanding of the magnitude of the spillovers in different circumstances.

Carreras et al. (2016a and b) quantify the magnitude of fiscal spillovers in individual members of the euro area (EA) using the National Institute's Global Econometric Model, NiGEM. The findings suggest that first year fiscal spillover multipliers from a temporary fiscal shock of 1% of GDP in Germany range between 0.01 to 0.3% of each country's GDP. The EA-wide spillover multiplier, excluding Germany, is about 0.1%. The spillover multipliers in the cases of France, Italy and Spain are somewhat smaller, reflecting the smaller size of these economies as well as a lower import penetration compared to Germany. Trade is the main transmission channel of spillovers between countries, and interest and exchange rates act to dampen this channel.

NiGEM captures many differences between EA countries. Some of the differences matter for the fiscal spillover multipliers. Naturally, countries that are more open to trade experience smaller multipliers, as the decline in demand is absorbed by imports to a larger degree. Moreover, countries whose agent's consumption plans are more sensitive to fluctuations in short-term income are found to experience larger multipliers. Country size also correlates with the magnitude of the multipliers: bigger countries induce a larger response from the monetary authority and policy rates act more aggressively to dampen the impact of the shock.

The researchers also found that fiscal multipliers increase significantly when countries coordinate their fiscal policies. There is a large degree of variation across countries, but the average percentage increase in the fiscal multiplier, in absolute value terms, is 60% for government spending shocks and 100% for revenue shocks. Most of the variation is explained by differences in openness of the EA economies.

An important aim of the analysis is to examine fiscal spillover multipliers during "crisis times". To this end, Carreras et al. (2016b) consider the sensitivity of the multipliers to reasonable increases in the proportion of agents that face liquidity constraints, an exercise that proxies the situation during severe downturns. The findings suggest that the increase in the magnitude of the multipliers from tax rate shocks is around 20% when looking at multipliers arising from fiscal shocks implemented in each country in isolation and around 25% when there is international coordination of fiscal policies.

These model-based results are roughly in line with most of the available empirical estimates. They are also in line with the empirical work undertaken within the FIRSTRUN project, see e.g. Belke and Osowski (2016).

The result that the fiscal spillover multipliers are on average rather small limits the need for active fiscal coordination in the EA, at least during “normal times”. However, the fact they may be much larger during “crisis times” and increase when fiscal policies are coordinated, underlines the importance of fiscal coordination in special circumstances.

### *Stabilisation policies*

Cole et al. (2016 and 2017) analyse the stabilisation properties of different scenarios for fiscal policy coordination in a two-country DSGE-model of a currency union, calibrated to mimic Germany and the rest of the EA. The model is characterised by country-specific price rigidities and distortionary taxes. The authors consider both complete and incomplete international financial markets. In the model, fiscal policy in one country influences the other country through its effects on net exports via the terms of trade. In the case of independent national fiscal policies, each country targets the output gap. Fiscal policy coordination is modelled as a joint commitment to reduce the volatility in net exports, which is the main source of fiscal spillovers in the model. In the latter scenario, the two countries can also decide to consolidate government budget constraints. This regime is defined as a full fiscal union. Therefore, the paper provides a framework for a systematic comparison of different scenarios for fiscal policy coordination in terms of output and price stabilisation and aggregate welfare in the currency union.

In this framework, the best policy, in terms of stabilisation, requires internalising spillover effects by reducing volatility in the terms of trade. This can be obtained when governments choose the level of national government consumption to reduce the net exports gap. Adding consolidation of government budget constraints slightly improves the overall stability, while simply targeting output gaps leads to less stabilisation, even of output itself. The intuition relates to the fact that with country-specific nominal price rigidities, business-cycle fluctuations imply destabilising fluctuations in the terms of trade.

In some situations, standard macroeconomic stabilisation tools are constrained. Conventional monetary policy may be constrained by a lower bound on short-term nominal interest rates. Fiscal policy in turn can be constrained because of EU fiscal rules or because private investors require prohibitively high rates of interest on government borrowing.

Hurst et al. (2016) consider the interaction of monetary and fiscal policies in EMU in situations in which standard policy tools are constrained using the NiGEM model. One key result of the analysis is that when only a subset of the monetary union is fiscally constrained, a domestic fiscal expansion by the remaining unconstrained members can provide a cross-country intra-union offset that makes all member countries better off than they would otherwise be. In other words, constraints on fiscal and monetary policy substantially increase the importance of fiscal coordination.

De Grauwe and Yi (2016) develop a new behavioural macroeconomic model to better understand why business cycles among eurozone countries are highly correlated. In their model, the synchronisation of the business cycle is produced endogenously. The main channel of synchronisation occurs through a propagation of “animal spirits”, i.e. waves of optimism and pessimism that become correlated internationally. In the model economy, the central bank has an even more important role in stabilising output than it does in more standard models. By forceful output stabilisation, the central bank can reduce the intensity of the movements in animal spirits and reduce the synchronisation of the business cycles in the monetary union.

In their paper, De Grauwe and Ji study endogenous business-cycle movements in a monetary union and derive some policy implications. Business cycles among eurozone countries are highly correlated. They develop a two-country behavioural macroeconomic model in a monetary union setting where the two countries are linked with each other by international trade. The net export of country 1 depends on the output gap of country 2 and on real exchange rate movements. The synchronisation of the business cycle is produced endogenously. The main channel of synchronisation occurs through a propagation of “animal spirits”, i.e. waves of optimism and pessimism that become correlated internationally.

### *Spillovers from structural reforms*

The literature on cross-country spillovers tends to focus on demand-side policies. However, there may also be spillovers from supply-side policies. Our project analysed cross-country spillovers from pension and tax reforms, all of which affect the supply side of the economy via changes in labour supply and investment (Davoine et al. 2016, Davoine 2017a, Davoine 2017b). The analysis is based on a multi-country OLG model (see below) and it takes cross-country differences in economic institutions and population ageing into account.

Regarding pension reforms, there are two key results (Davoine 2017a and b). First, pension reforms in one country have impacts on other countries. Second, pension reforms influence the extent to which countries can benefit or suffer from capital market integration over the long run.

The first result is not a surprise, given the integration of the capital markets. For some reforms, cross-country spillovers due to the integration of capital markets can increase the reform gains. For instance, gradually postponing the retirement age by 2.5 years in Germany would lead to a 0.2 percentage points higher GDP per capita, on average in each of the next 50 years, when the capital markets are integrated compared to a closed economy. The reason is the following: the postponed retirement age lowers the capital-labour ratio, which increases the returns to investment and thus attracts capital towards Germany, boosting production.

Differences in institutions also play a role in the second result. As an example, we may consider the case of Denmark. If no country implemented a pension reform, and all countries used labour income taxes to finance the increase in social security expenditures due to population ageing,



Denmark would lose from capital market integration. Its GDP per capita would be on average 1.9 percentage points lower in each of the next 50 years than in a closed economy. However, if all countries gradually increased the retirement age by 2.5 years, Denmark would gain from capital market integration. In that case, its GDP per capita would on average be 0.8 percentage points higher in each of the next 50 years than in a closed economy.

The main reason why the effect of capital market integration is different in these two cases is the current size of the Danish welfare state, which requires a high level of taxation. In the first case, the tax increase would have a large disincentive effect on labour supply. This would increase the capital-labour ratio more than in other countries. Returns to investments would thus drop more in Denmark and capital would slowly flow out of the country. In the second case, the Denmark's slow population ageing effect would dominate. As the Danish population is aging less rapidly than in other countries, labour supply per capita drops less and the capital-labour ratio rises more slowly, with the result that returns to investment are increasingly higher than in other countries, attracting capital from abroad.

*Ceteris paribus*, the analysis provides one more benefit for retirement age increases, compared to reductions in pension payments and increases in social security contributions. Postponed retirement lowers the capital-labour ratio, thereby helping to attract foreign capital. The analysis also implies that immigration can help attract investments, as it lowers the capital-labour ratio. This strengthens the benefits to be obtained from immigration.

Davoine et al. (2016) also use the same multi-country OLG model to quantify cross-country spillovers from fiscal policy reforms. Spillovers, which occur via integrated capital markets, are found to be small for standard reforms. For instance, a labour income-tax reduction in Germany that increases GDP in Germany by 0.4% would not increase GDP more than 0.01% in other countries, a spillover ratio below 2%.

## **2 Cross-country risk-sharing and shock absorption in the euro area**

In the economic literature analysing the functioning of monetary unions, the mechanisms for smoothing the impact of shocks are of critical interest. Alcidi et al. (2017) and Alcidi and Thirion (2017) provide an in-depth analysis of how the impact of GDP shocks are smoothed through different channels, in the euro area. The papers measure: i) how cross-member-state risk-sharing, which proxies the role of international capital markets, allows to distribute the impact of shocks across countries; ii) how fiscal policy, savings and access to credit allow the impact of shocks to be smoothed over time; and iii), last but not least, what portion of a GDP shock is not absorbed and hence affects consumption.

The analysis is carried out for the euro area and for the US, using euro-area aggregates suitable for comparison. The US serves as a benchmark for the capacity of a fully-fledged fiscal, monetary and banking union to deal with shocks. A number of results are strongly in line with the existing

literature and add few qualifications. First of all, the capacity of the euro area to absorb shocks has always been weaker than in the US and this has been particularly the case since 2010. Capital markets in the US serve as the most powerful channel to absorb the impact of idiosyncratic shocks. This absorption has been on the order of 50%, despite a sharp decline and then a recovery since 2008. In the euro area this is much smaller, but the use of fully comparable data reveals that until 2008, it was higher than usually estimated, about 30% instead of 10% as is usually cited in the literature. This difference is due to the fact that in the US accounting system, companies' retained earnings are counted as international factor income and not as savings. Despite such adjustment, after 2009 corporate retained savings were no longer helpful and capital markets seemed to become completely dysfunctional, working to amplify the impacts of the shocks rather than to smoothen them.

Alcidi et al. (2017) suggests two possible explanations for these findings. The first is that after 2009, dynamics within the euro area have become very different in core and peripheral countries and average findings are strongly driven by the high variation in the peripheral countries. This is the result of a much deeper downturn and financial fragmentation along national borders.

The second explanation relates to the persistence of shocks and the evidence that net savings (private savings, access to credit or even government borrowing) have limited effective capacity in smoothing consumption against persistent or permanent shocks. The empirical results suggest that net savings are more important than capital markets in smoothing the impact of shocks in the euro area. In particular, corporate savings and government budgets, with the exception of peripheral countries during the debt crisis, are the most important sources of intertemporal risk-sharing, which is mostly achieved domestically through pro-cyclical investment adjustments, rather than through access to international credit markets. Alcidi et al. (2017) also find that asymmetric shocks exhibit higher persistence in the euro area than in the US. The combination of persistent shocks combined with the weak role of financial markets can explain low shock absorption in the euro area.

In contrast to savings, cross-country risk-sharing, through capital markets, should be 'immune' to persistent shocks, as far as shocks are uncorrelated across countries

The results pointing to the limited role of credit markets combined with the evidence that capital markets in the euro area exhibited very limited shock absorption capacity, raises a fundamental question about the role played by financial integration in providing stabilisation capacity. In fact, it is likely that such poor performance is not independent of the high (and fast-growing) degree of financial integration that characterised the first decade following the introduction of the euro and then the fragmentation that followed the debt crisis. As financial integration occurred mostly through cross-border bank lending, which led to the accumulation of debt, when the debt crisis started markets' behaviour resulted in a sudden stop rather than in the provision of risk-sharing.

Moreover, Alcidi and Thirion (2017) investigate the US fiscal mechanisms for cross-state risk-sharing to draw lessons for the euro area and how to potentially increase the absorption of

asymmetric shocks through an additional but currently non-existent mechanism, namely a federal fiscal capacity. According to the authors, the empirical evidence indicates that the stabilising role of US federal transfers to states is largely overstated. Despite the absence of a centralised euro-area stabiliser, the automatic stabilisers in the euro area bring about a greater degree of insurance against asymmetric shocks than that provided by the US federal budget. To some extent, this is attributable to the higher degree of market-based risk-sharing and to the existence of other public institutions enhancing financial stability and private risk-sharing in the US. Yet, they show that US federal fiscal policy appears to be primarily a stabiliser of US-wide shocks, rather than idiosyncratic shocks.

The empirical findings described above point to a number of policy insights.

First, financial integration is not a sufficient condition for cross-country risk-sharing to occur. Financial integration needs to materialise as cross-border ownership of productive assets and this did not happen to a large extent in the euro area. The exact aim of the capital markets union (CMU) is to foster integration within capital markets. If this aim is successfully achieved, it could have an important impact on risk-sharing and the absorption capacity of asymmetric shocks. A corollary insight of this analysis relates to the fact that returns on cross-border holdings of assets need to be negatively correlated in order to deliver effective risk-sharing. This implies that full synchronisation of business cycles in the euro area may not be a desirable objective from a risk-sharing perspective.

The second policy insight relates to the role played by fiscal policy in response to shocks. While the findings illustrated above focus on responses to asymmetric shocks, member states' fiscal policy (and particularly automatic stabilisers) responds to domestic business-cycle conditions, i.e. deviations from trend or potential output. For a certain country, a large adverse asymmetric shock is likely to correspond to a large negative output gap, but this is not always and necessarily the case. If it is not the case, fiscal policy will not and should not be expected to deal with asymmetric shocks. For this reason, and similar to the US experience, asymmetric shock should be smoothed through the capital markets. This makes the CMU even more relevant.

The third policy insight relates to the lessons drawn from the US system and the features of a potential euro-area shock-absorption capacity. Acknowledging that in the case of the US, what is usually called capital-markets absorption capacity captures, not only private sector risk-sharing, but potentially the stabilising effect of federal institutions – e.g. unconventional monetary policy, and the Federal Deposit Insurance Corporation (FDIC) and/or interventions – it remains a fact that federal fiscal instruments play a limited role in dealing with asymmetric shocks. The discretionary nature of the US federal fiscal policy and the ability to borrow at federal level makes the US federal budget particularly relevant, and suitable to be triggered, in response to nation-wide (symmetric) shocks, rather than asymmetric shocks. In the context of the euro area debate about a fiscal stabilisation function at the central level, this implies critical thinking about the purpose (i.e. the stabilisation of precisely what, in response to what shocks) and the features (e.g. borrowing /no borrowing capacity) of such a function.

### 3 Real-time uncertainty

Our knowledge of the current state of the economy is always imperfect. For instance, first estimates of GDP for a given period are often subsequently revised. In other words, ex-post measures of GDP and other economic variables may be quite different from their real-time estimates. Our project has quantified this type of uncertainty and studied how it affects the cyclical properties of fiscal policy.

Real-time uncertainty appears to be very relevant for fiscal policy. Essentially, this is because it is particularly difficult to distinguish between cyclical and structural components of economic growth. As a result, the first estimates of variables like the output gap or structural deficit, which are key variables to consider when setting the stance of fiscal policy, are often later substantially revised. Busse (2016) describes in detail the revisions of the cyclically-adjusted budget balances of the EU-15 countries.<sup>1</sup>

Alcidi et al. (2016) consider the cyclical properties of fiscal policies in EU-27 countries. The outcome looks quite different depending on whether one uses real-time or ex-post output gaps to measure the business cycle. Specifically, fiscal policy appears much less pro-cyclical (and appears to be approximately independent of the cycle) when the cycle is estimated using real-time data rather than ex-post data.

While real-time uncertainty can perhaps be reduced by using better techniques to estimate cyclical changes, it cannot be completely eliminated. Kuusi (2017) takes real-time uncertainty as given and asks how its presence should affect optimal fiscal policy. The analysis is based on a relatively parsimonious model where the policy-maker aims to smooth aggregate consumption over time. The key challenge the policy-maker faces is the difficulty of distinguishing between cyclical and trend shocks. Output gap uncertainty in the model is calibrated to match output revisions in EU countries.

The main result of this analysis is that real-time uncertainty about the output gap makes the optimal fiscal policy much less pro-cyclical relative to the full-information case. It also calls for substantially lower average public debt levels than what would otherwise be optimal.

### 4 Fiscal rules

The EU fiscal governance framework has been extended and modified in many ways during the last 10 years or so. An important aim of the FIRSTRUN project has been to evaluate the new, enhanced framework.

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<sup>1</sup> Many of our studies on real-time uncertainty use data that were extracted from the AMECO dataset. The data set is available at <http://www.firstrun.eu/research/data/>.

For example, our approach has been to consider how the new fiscal rules would have constrained fiscal policies during past economic crises. The analysis requires having a clear view on the information that was available at the time when the rules would have applied. This brings real-time uncertainty into the picture again.

Kuusi (2016) considers the European Commission's output gap method of calculating the structural budgetary position (SB). He tests the method and its implications for fiscal policy by computing the fiscal requirements that Finland would have faced between the years 1984-2014 based on the real-time estimates of the SB together with the fiscal rules in the preventive arm of the SGP. The Finnish case is interesting partly because it includes the that country's Great Depression of the 1990s.

The main result of this analysis is that the use of the structural deficit for steering fiscal policy would have led to pro-cyclical fiscal policy. One reason is the limited capacity of the output gap method to predict cyclical changes in real time. As a result, the rules wouldn't have constrained fiscal policies during "good times".

Kuusi (2016) also considers alternative methods for estimating the SB that are used within the EU fiscal framework, namely the expenditure rule in the preventive arm of the SGP and the so-called bottom-up assessment method in the corrective arm. The starting point in these indicators is the direct analysis of actual policy changes instead of indirect assessments based on the output gap method.

The main result is that the use of these alternative measures would have led to a more counter-cyclical fiscal policy. This suggests that they should be given more weight when assessing the structural fiscal position of an EU member country.

Domonkos et al. (2017) evaluate the crisis prediction ability of the MIP Scoreboard's headline and auxiliary indicators. They ask whether the MIP would have been able to detect increasing macroeconomic risks prior to the 2008 financial crisis and the following recession. They also evaluate the thresholds and estimate their optimal value subject to a policy-maker with preferences assigning equal importance to both missed-crisis and false-crisis prediction errors. The analysis also covers the impact of data revisions.

The results show that the MIP would have provided moderately useful alerts in terms of crisis prediction before 2009. The most useful indicators appear to be those related to external sector imbalances, such as changes in the nominal unit labour costs and export market share. However, many of the indicators, especially those related to the financial markets, would have been uninformative. This suggests that the MIP Scoreboard's revision, which can produce a simpler but still-effective system, may be in order. The analysis also provides recommendations regarding how the thresholds should be set.

Poniatowski (2018) considers the actual impact and the credibility of the fiscal framework. The econometric analysis shows that the significant variation of fiscal effort across time and across EU

member countries can be explained to a large extent by institutional factors, including the existence of numerical fiscal rules and surveillance mechanisms. The most influential instruments appear to be the expenditure rules and the external sanctions for breaching the rules. To ensure the credibility of the framework, from a theoretical standpoint, the analysis suggests that the benefits of fiscal prudence and sanctions for breaching fiscal rules should be differentiated in line with the exerted fiscal effort.

## **5 Political economy and institutional challenges**

The many changes in EMU governance raise difficult issues of legitimation. Begg (2015) argues that the upshot is the emergence of a new mode of EU governance, which is labelled the “expenditory state”. It arises from the conjunction of legally binding fiscal rules, establishment of fiscal councils and more intrusive oversight by the EU level of governance. Given that fiscal policy has more direct distributive consequences than other areas of policy, which have become more technocratic, the erosion of democratic legitimation potentially undermines the implicit contract between voters and national governments. Although this dimension of governance reform has been identified in successive EU reports (notably those of the Four and Five Presidents) as requiring attention, solutions are still in abeyance.

In addition, public trust in decision-makers has been shaken. If not attended to, this ‘deep variable’ could result in political problems for the euro area. An implication for policy development is that the shifts inherent in the drift of fiscal policy call for a more profound rethinking of legitimacy. The concept of throughput legitimacy – validating how the EU level decides on the policy demands it makes on member countries – is suggested as one dimension of legitimation to be explored. The problem is to find answers that reconcile the desire for collective discipline, portrayed as being in the common interest, with national autonomy and democratic choice.

The political economy research also raises doubts about whether a system of governance that relies on rules can be effective. Some of the shortcomings of the design of EU rules have been extensively analysed, but Begg (2017) argues that implementation difficulties justify a different approach. Fiscal councils could be part of an answer, but because they have only recently been established in many member countries, there is not yet sufficient evidence of how much impact they have had. The case studies reported in Begg et al. (2017) are encouraging, but they also point to the scope for clashes with governments. A sensitive question is how to factor fiscal councils into legitimation and accountability.

The corollary is that seeking further to redesign or recalibrate rules as the cornerstone of EMU reform is likely to offer a false prospectus. Instead, what is needed is better definition of the EU’s fiscal constitution and, within it, of how the different elements of public finances are brought together. Rules may still have a place but a more limited one and, because of the implicit contract

between voters and taxpayers, on one side, and decision-makers on the other, the political dimension of fiscal policy must move to centre-stage.

The political economy work is developed into a policy report (Begg, 2018) offering a number of recommendations. These include:

- dealing more decisively with legitimisation concerns;
- rationalising and simplifying fiscal rules and revisiting institutional relationship to arrive at a better balance between enforcement, compliance and appropriateness
- potentially abandoning the macroeconomic imbalances procedure; and
- developing the role of fiscal councils as more legitimate agencies for monitoring national policy

## 6 Tools for policy analysis

### *An applied multi-country OLG model*

Multi-country macroeconomic models are needed to quantify the international impacts of national policy reforms or demographic shocks. Existing macroeconomic models typically fall in three categories. In the first category, models focus on short-run effects, mostly considering the impact of monetary policy, but ignore the long-run impact of population aging.

In the second category, models include population ageing but focus on qualitative and theoretical research questions. They are often multi-region rather than multi-country models and are stylized rather than large-scale models, as they make a simplified representation of economic institutions.

In the third category, models are large-scale and take population ageing into account, but only cover one country. The problem is that such models cannot account for how aging, or e.g. pension reforms, in the rest of the world, affect the country in question via international capital markets. Single-country models relying on the small open economy assumption feature constant (or at least exogenous) interest rates and returns to investments. Single-country models with a closed economy assumption in turn rule out international capital flows by design.

There exists no large-scale, multi-country macroeconomic model taking population ageing into account, allowing quantification of long-run national and international impacts for policy evaluation purposes. To fill the gap, Davoine et al. (2016) and Davoine (2017a) have developed a new multi-country model. This model combines existing large-scale, single-country overlapping-generations models, whose basis was developed by the IHS for the European Commission (DG EMPL). The resulting multi-country model includes 14 EU countries covering more than 80% of the total EU population.

The model allows analysing national policy reforms and demographic changes as well as internationally coordinated policy reforms, taking into account international spillover effects via international capital markets. The model also allows considering the fiscal consequences of central budgets options at the EU level, taking into account the impacts for both donor and recipient countries (see Davoine 2017b).

#### *An OLG model with sustainability risks*

The EU fiscal framework aims to make member countries pay more attention to how public debt and deficits are expected to evolve in the medium run and the long run. To facilitate this aim, Lassila (2016 and 2017) develops an open-economy overlapping-generation model that is calibrated to the Finnish economy and institutions. It features stochastic demographics, labour productivity growth and asset yields (in the first pillar pension funds). These uncertainties make the structural fiscal position uncertain. In the model, fiscal strategies are based on the point estimates of these variables.

The model allows for testing and developing alternative fiscal-policy strategies that are explicitly based on the Medium-Term Budgetary Objective. Arguably, one criterion for a good fiscal strategy is that it results in as much tax smoothing as possible. Due to its OLG structure, the model also allows taking into consideration intergenerational equity.

#### *A dynamic simulation model of the fiscal rules*

The new fiscal framework includes multiple rules and target measures that steer fiscal policy both in the short and long term. The complexity of this framework, however, may make analysis difficult. To provide more clarity, our project has developed an entirely new dynamic simulation model that allows quantifying the constraint that the rules impose on fiscal policy. The model developed in Kuusi (2017) allows quantifying multi-year adjustment programmes that minimise the need for fiscal adjustments while being compliant with the key elements of the framework.

Technically, the fiscal rules are introduced as constraints to a mathematical minimisation problem. They govern different parts of an adjustment programme towards the fiscal targets at the end of the adjustment, including requirements for the pace of adjustment (the deficit rule and the flexibility guidance), the target at the end of the programme (the debt convergence rule and the medium-term objective of the structural balance MTO) and deadlines (the debt transition rule). The programme is contingent on an underlying economic forecast.

Importantly, the model also allows taking into account possible output responses of fiscal adjustments (multiplier effects). The appropriate anticipation of output responses should facilitate designing realistic fiscal adjustment programmes in the future. The collective analysis of the rules may also pinpoint caveats in the overall design of the rules and guide their further development.



### *Macroprudential policy model within NiGEM*

Since the global financial crisis, there has been increasing interest in macroprudential policy. Clearly, macroprudential policies may also increase economic stability in the EU. However, policy measures should be based on careful cost-benefit analyses. Existing analyses often omit feedback from the macroeconomy to the financial sector. This is partly because of the difficulty in modelling the emergence of “disequilibria” that motivate macroprudential policies in the first place in structural general equilibrium models.

The FIRSTRUN project has developed a new macroprudential policy model within the NiGEM model (Carreras et al. 2016 and 2017), which is a semi-structural global macroeconomic model. Specifically, the existing NiGEM model is expanded to include two macro-prudential tools, namely loan-to-value ratios on mortgage lending and variable bank capital adequacy targets. The former has an effect on the economy via its impact on the housing market while the latter acts on the lending spreads of corporate and households. A systemic risk index that tracks the likelihood of the occurrence of a banking crisis is modelled to establish thresholds at which macroprudential policies should be activated by the authorities.

The model allows performing a cost-benefit analysis of macroprudential policies that takes feedback effects from the macroeconomy to the financial sector into account. Users may activate macroprudential policy directly or policy may be triggered endogenously when a systemic risk indicator exceeds a critical value, which can be set by the user and may vary between countries.

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