

THE FISCAL AND MONETARY INSTITUTIONS OF CESEE COUNTRIES

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Highlights

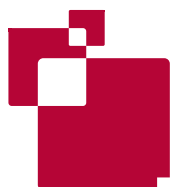
- This paper examines the role of fiscal and monetary institutions in macroeconomic stability and budgetary control in CESEE (central, eastern and south eastern European) countries, in comparison to other OECD countries.
- CESEE countries tend to grow faster (at least before the crisis) and have more volatile output than non-CESEE OECD countries. This has implications for macroeconomic management: better fiscal and monetary institutions are needed to avoid pro-cyclical policies. Our budgetary discipline index suggests that fiscal institutions are weaker in most CESEE countries than in non-CESEE OECD countries.
- The pre-crisis declines in CESEE debt/GDP ratios were largely the consequence of a very favourable relationship between the economic growth rate and the interest rate, but this cannot be expected to continue. Our econometric estimations confirm that better monetary institutions reduce macroeconomic volatility, and countries with better budgetary procedures had better fiscal outcomes. All these factors call for improved monetary institutions, stronger fiscal rules, and better budgetary procedures.

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1. Introduction

This paper aims to identify the major institutional determinants of macroeconomic stability and aggregate budgetary control in central, eastern and south-eastern European (CESEE) countries¹. The region grew rapidly before the crisis, but the crisis hit most of these countries hard – more so than any other country group of the world – and recovery from the crisis has also been generally slow. As a consequence, the pre-crisis seemingly smooth economic progress and good budgetary record suddenly came to an end.

Have fiscal² and monetary institutions played important roles in macroeconomic stability and aggregate budgetary control? Since the crisis had a decisive impact on both macroeconomic stability and budgetary control, the impact of these institutions on the build-up of pre-crisis vulnerabilities and on crisis response has a crucial relevance to this question. This paper defines fiscal institutions as a set of arrangements directing budgetary preparation (including expenditure frameworks and fiscal rules), approval and execution. Monetary institutions are associated with the exchange rate regime, the quality of financial regulation and supervision, the independence of central banks, and the transparency of central bank decision making. Causal links from fiscal and monetary institutions to budgetary control and macroeconomic stability can be hypothesised as follows:

- Fiscal institutions and macroeconomic stability: Countries with better fiscal frameworks are presumably following counter-cyclical fiscal policy. Letting automatic stabilisers run and implementing counter-cyclical discretionary fiscal policy through the business cycle can dampen macroeconomic volatility.
- Fiscal institutions and budgetary control: Better fiscal institutions can directly lead to better budgetary outcomes (*i.e.* low deficit or surplus, and low public debt) by constraining fiscal policy.
- Monetary institutions and macroeconomic stability: The ultimate goal of monetary policy should be the stabilisation of the economy through the business cycle, and better monetary institutions should be more successful in achieving this goal. Monetary institutions are defined broadly, and the role of financial stability is considered through regulation and supervision. The crisis has proven even more clearly that financial stability has strong implications for macroeconomic stability.
- Monetary institutions and budgetary control: There should not be a direct causal link from monetary institutions to budgetary control. However, the indirect channel through a higher level of macroeconomic stability can work.

¹ This paper analyses 26 countries of central, eastern and south-eastern Europe: 12 central European and Baltic members of the EU (Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak Republic, Slovenia), the six European CIS countries (Armenia, Azerbaijan, Belarus, Moldova, Russian Federation, Ukraine), five non-EU countries of former Yugoslavia (Bosnia and Herzegovina, Croatia, FYR Macedonia, Montenegro, Serbia), and Albania, Georgia and Turkey.

The information in this paper with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey will preserve its position concerning the “Cyprus issue”.

² For the purposes of this paper, “budgetary” and “fiscal” have the same meaning.

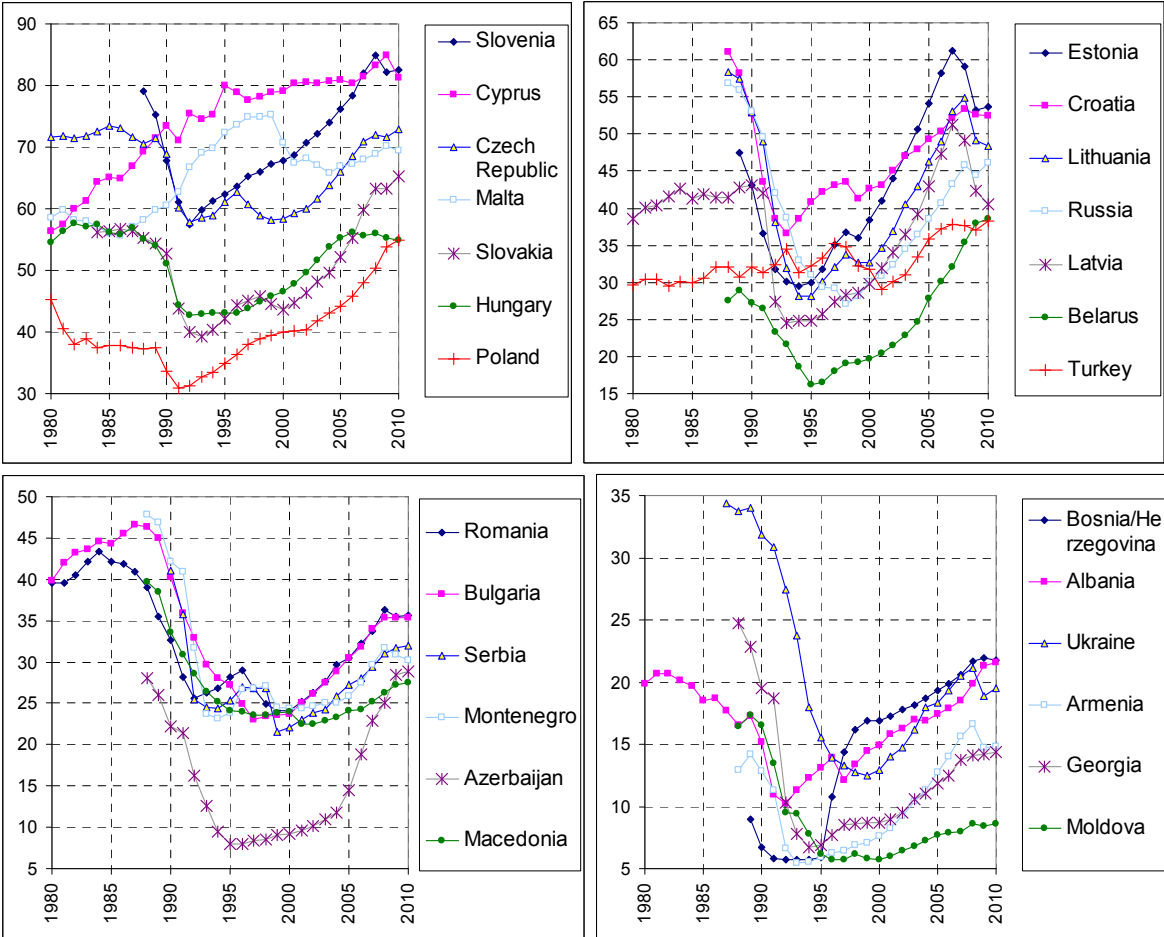
The paper is structured as follows. Section 2 describes macroeconomic stability and budgetary outcomes. Budgetary institutions are assessed in Section 3: the “Budgetary Discipline Index” deviates from similar indices in the literature as it considers a set of institutional features that focus specifically on budgetary discipline. Section 4 discusses monetary institutions. Section 5 presents the empirical analysis on the impact of fiscal and monetary institutions on macroeconomic stability and budgetary control. Section 6 presents some concluding remarks.

2. Macroeconomic stability and fiscal outcomes

2.1. Development of GDP

Most of the CESEE countries (except Cyprus, Malta and Turkey) went through a historically unprecedented transition from socialist political systems towards democracies and from centrally planned economies towards market economies. The extraordinarily deep recession after the collapse of the communist regimes was followed by a fast and apparently smooth economic recovery – that is, growth of per capita GDP has well exceeded the growth in the CESEE region’s main trading partners [Figure 1].

Figure 1. GDP per capita at purchasing power parity (EU15=100), 1980-2010

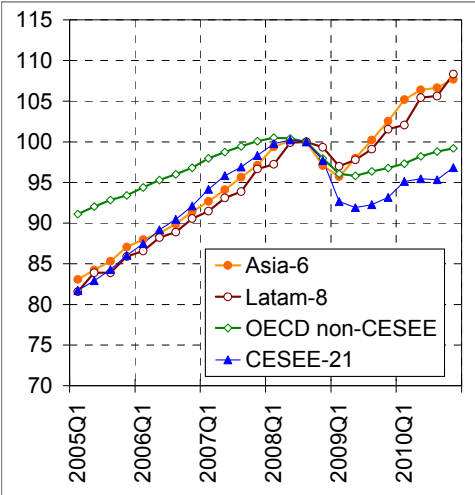


Note: Countries are ranked according to their 2010 forecast values.
 Source: Authors’ calculations based on data from the IMF *World Economic Outlook* April 2010 and EBRD database on main macroeconomic indicators.

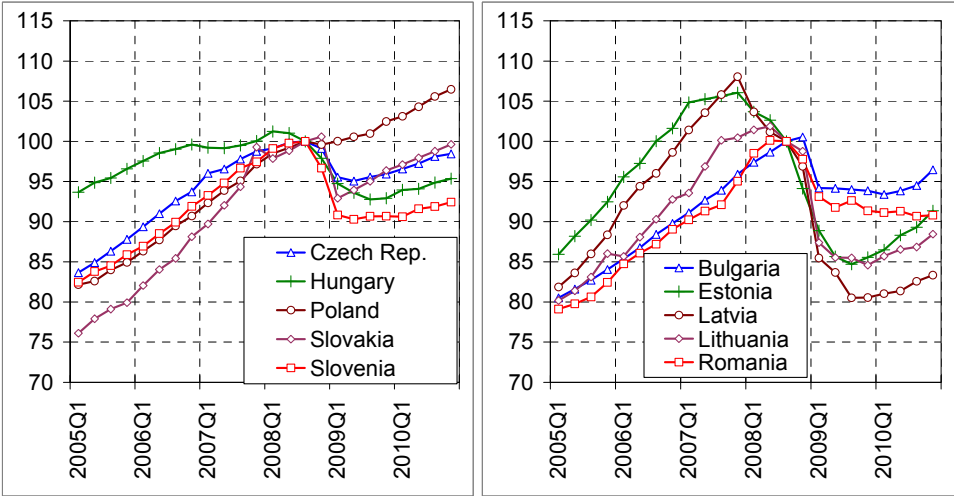
Figure 1 also indicates that the duration of the recession in the 1990s (the transition period) varied substantially across CESEE countries, which complicates the selection of a start date for the sample period for the econometric analysis in this study. The current global financial and economic crisis complicates the selection of the end date of the sample period. Figure 1 indicates that the recovery has halted in several CESEE countries and even reversed in some of them. Quarterly GDP indicators also show that recovery from the crisis is in general slow in CESEE countries and much slower than in other emerging country groups (Figure 2). For example, in the six small and open Asian economies shown in Panel A of Figure 2, output growth is currently faster than it was before the crisis, implying that these countries may converge to their pre-crisis trend line. But in CESEE countries, the speed of recovery so far falls behind pre-crisis growth, even though there is heterogeneity: Albania and Poland have not suffered from a recession in 2009, while in Armenia, Estonia, Latvia, Lithuania and Ukraine the drop in output was close to or even above 20%.

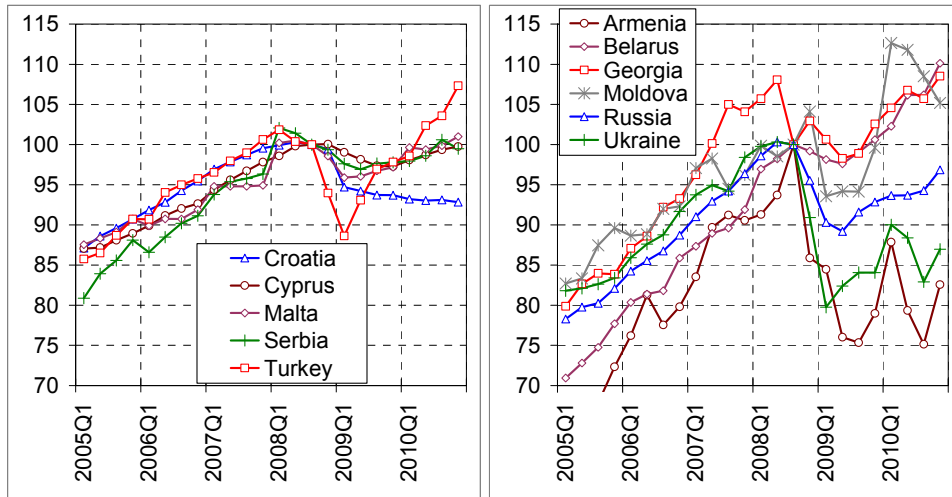
Figure 2. Quarterly GDP developments (2008Q3=100), 2005Q1-2010Q4

Panel A. Main country regions



Panel B. CESEE countries





Notes: Country group averages in panel A are non-weighted averages. Asia-6: Indonesia, Korea, Malaysia, Philippines, Taiwan and Thailand. Latin America-8: Argentina, Brazil, Chile, Columbia, Ecuador, Mexico, Peru and Uruguay. CESEE-21: the average of the 21 countries shown in Panel B. OECD non-CESEE: 27 OECD countries except Czech Republic, Hungary, Poland, Slovak Republic, Slovenia and Turkey.

Sources: Eurostat (EU countries and Croatia), OECD (other OECD countries and Russian Federation), and national statistical offices, IMF and EBRD quarterly GDP database (other countries). Whenever seasonally adjusted series were not available, the Census X-12 method for seasonal adjustment was used.

The reasons behind both the more serious average impact of the crisis on CESEE countries and the diversity among those countries have been studied (see, for example, Mitra, Selowsky and Zaldueño, 2009; Darvas, 2010; and Becker *et al.*, 2010), so only the main issues are summarised here.

The pre-crisis development model pursued by CESEE countries had many special features compared to other emerging economies. It was based on deep political, institutional, financial and trade integration with the EU³ which was also accompanied by substantial labour mobility into EU15 countries. Other emerging country regions did not have an anchor similar to the role the EU played for CESEE countries. Economic growth in the CESEE region relied on net private capital inflows, which have reached higher levels than elsewhere. In the aftermath of the dramatic crises in Asia and Latin America in the late 1990s and early 2000s, the CESEE region was the only emerging region of the world that had persistent current account deficits. Economic recovery was accompanied by real exchange rate appreciations – again a largely unique feature of the CESEE development model – and real interest rates fell.

But the CESEE development model had two important variants within the region. Some countries, most notably countries in central Europe, were more successful in making use of the development model. In these countries, pre-crisis growth was accompanied by small and even improving trade balances, as a reflection of reindustrialisation after the collapse that followed the fall of communist regimes. In most of the other countries, however, the trade and current account balances deteriorated sharply before the crisis, reaching double-digit levels in several cases. As a

³ There are also differences within the CESEE region, however. The new EU member states have reached the highest level of integration, followed by the countries of the western Balkans and Turkey that have the status of either EU candidate or potential candidate. The six Eastern Partnership countries, which were part of the Soviet Union, have reached varying degrees of integration with the EU15, and the Russian Federation still remains an important anchor for these countries.

consequence, external debt rose fast before the crisis. Also, housing prices rose much faster and real exchange rate appreciation was also more rapid, while real interest rates fell to lower levels than in central European countries and inflation also rose considerably before the crisis. All of these factors suggest that economic growth in this group of countries was to a considerable extent fuelled by unsustainable booms. Indeed, there was extremely rapid growth of credit to the private sector, and the composition of foreign direct investment (FDI) was also biased in favour of banking, real estate and other domestic sectors.

When the crisis started, most people thought that the CESEE region would not be hit too hard. For example, the April 2008 *Regional Economic Outlook Europe* of the IMF foresaw that “emerging Europe’s convergence trend is set to continue, based on good fundamentals, although its pace is likely to slow” (IMF, 2008), and other institutions and commentators shared this view. However, after the collapse of Lehman Brothers, there was a sudden interruption, and even reversal in some countries, of capital inflows to CESEE countries. This led to a credit crunch which, combined with the subsequent export and investment declines, has depressed economic activity. Commodity exporters, such as Azerbaijan, the Russian Federation or Ukraine, were also hit by falling commodity prices. As the crisis unfolded, the credit crunch was replaced by falling demand for credit, caused by increased uncertainty and lowered expectations with respect to future growth prospects (Ghosh, 2009).

The diversity of responses to the crisis within the CESEE region could be related to different reliance on pre-crisis capital inflows, trade and commodity exports. But the crisis responses have likely been influenced by the fiscal and monetary policies during the crisis: only a few CESEE countries (e.g. Azerbaijan, Czech Republic, Poland, Russian Federation, Slovenia, and Turkey) implemented fiscal stimulus in order to dampen the crisis. Most other countries had to consolidate public finances, thereby likely amplifying the downturn (Darvas, 2010)⁴. Furthermore, monetary policy could not be eased at a time when capital was moving out, and indeed several countries had to raise interest rates as well.

2.2. Macroeconomic stability

Two measures of macroeconomic stability are used for the econometric analysis of Section 5 below:

- volatility of GDP growth rates, 2000-10
- output decline in 2009

The first one can be regarded as an average measure of stability, while the second can be regarded as a “tail” event. The selection of these measures is based on the following:

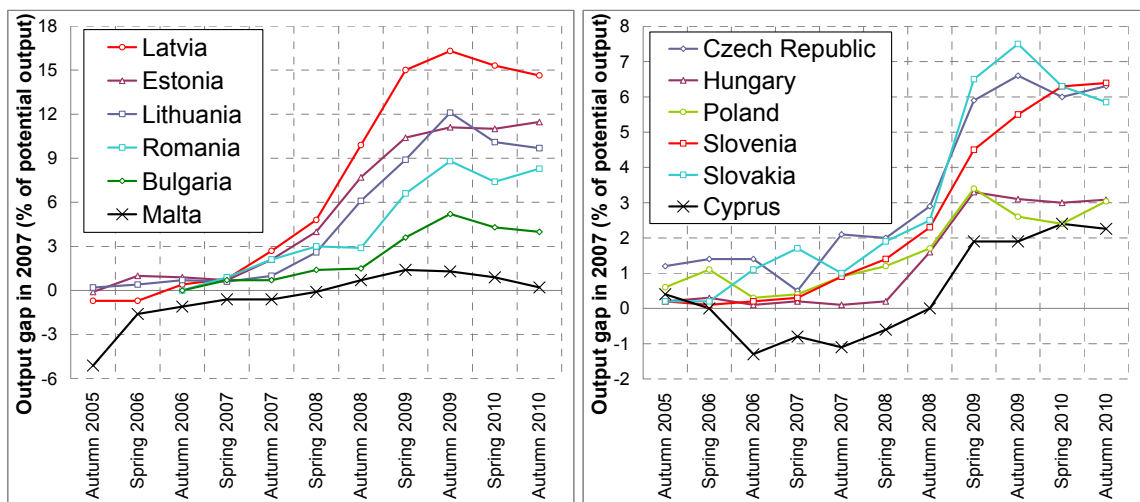
The developments described in the previous sub-section suggest that considering the pre-crisis period only would be misleading, since pre-crisis economic growth has led to economic structures that made CESEE countries more prone to the crisis. In particular, the seemingly fast and smooth growth before the crisis has led to vulnerabilities in several CESEE countries, which eventually resulted in huge output falls and slow recoveries so far. Therefore, the crisis should be included in the sample. On the other hand, the 1990s was burdened with so many structural changes that the inclusion of this sample period would not be informative. Therefore, whenever data availability

⁴ The appendix table in Darvas (2010) details the fiscal measures taken by CESEE countries in response to the crisis.

allows, the sample period of 2000-10 is used when studying macroeconomic stability, but a pre-crisis sample period (2000-07) is also used for comparison.

Macroeconomic stability has various interpretations⁵. The focus here is on GDP volatility, which of course can also reflect internal and external disequilibrium. Ideally, GDP volatility should be measured as the volatility of the deviation from potential output. However, measures of potential output are especially uncertain for countries like those of central, eastern and south-eastern Europe and at the time of the global crisis. An example is given in Figure 3 which depicts the 2007 output gap in EU member CESEE countries as seen at different dates, using data from the European Commission. The figure shows huge revisions in potential output calculations. The EC first published forecasts for the 2007 output gap in autumn 2005, when it predicted, for example, that the output gap of Latvia in 2007 would be -0.7%. This forecast was maintained in the spring of 2006, but later it was substantially revised upward. In the spring of 2008, the 2007 output gap was seen as 4.8% and in autumn 2009 it was seen as 16.3%. Therefore, we do not study the volatility of the output gap, but concentrate on GDP growth.

Figure 3. The 2007 output gap as seen at different dates

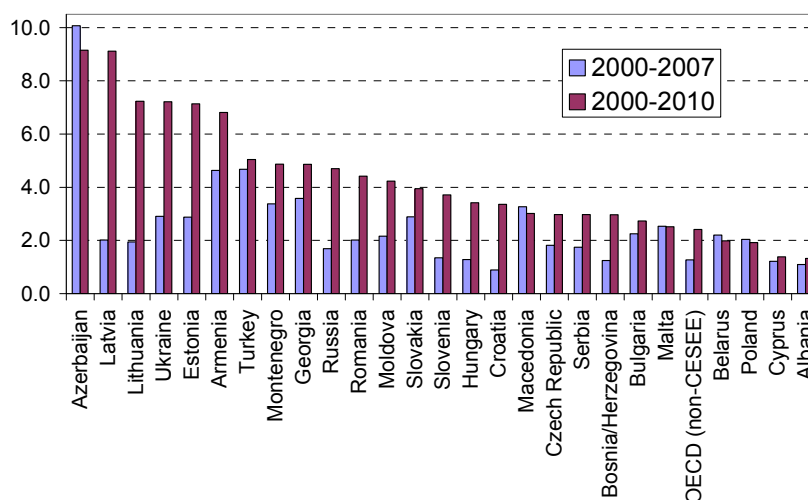


Source: European Commission forecasts made at the dates indicated on the horizontal axis.

Figure 4 shows the standard deviation of real GDP growth rates in 2000-07 and in 2000-10 in order to assess the possible increase in volatility in response to the crisis. Indeed, considering the pre-crisis period of 2000-07, volatility was seemingly low in several CESEE countries. In some cases, volatility was even below the average of non-CESEE OECD countries. However, data for 2000-10 suggest that the seemingly low pre-crisis volatility has indeed masked underlying vulnerabilities. In some cases, such as Estonia, Latvia, Lithuania and Ukraine, the rise in volatility is quite dramatic. On the other hand, there are four countries (Albania, Belarus, Cyprus and Poland) where volatility is below the non-CESEE OECD average in the 2000-10 period.

⁵ At the broadest level, macroeconomic stability can be defined as the volatility of output. It could also be defined, for example, as the level and volatility of inflation (representing internal equilibrium in the economy) or the level and volatility of the current account balance (representing external equilibrium). However, the assessment of both internal and external equilibrium is complicated by the economic developments of CESEE countries.

Figure 4. Standard deviation of annual GDP growth rates



Source: Authors' calculations using data from the IMF *World Economic Outlook* April 2010.

2.3. Fiscal outcomes

Two measures of fiscal outcomes are used for the econometric analysis of Section 5 below:

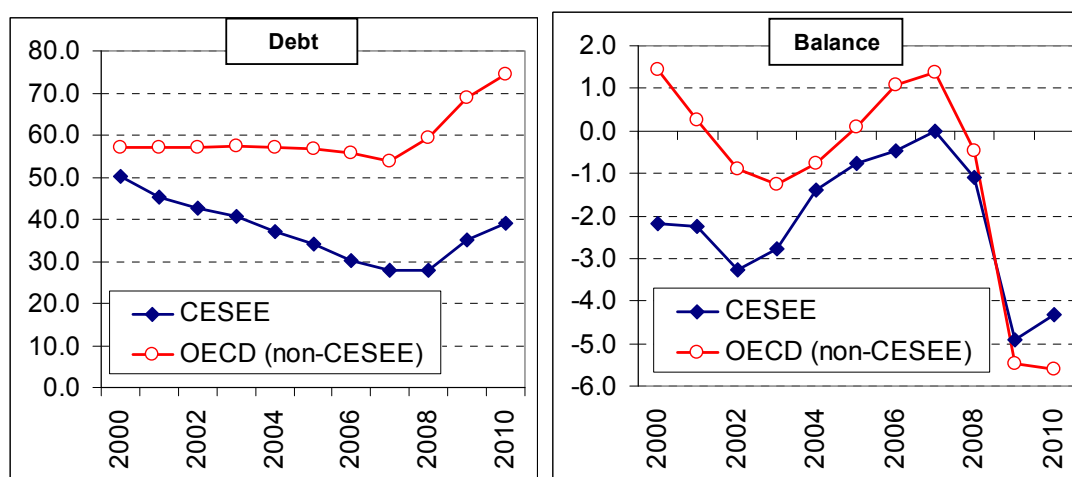
- average general government balance (as a per cent of GDP) in 2000-10
- change in general government gross debt (as a per cent of GDP) from 2000 to 2010

The two measures are related, but not perfectly, as will be demonstrated below. The second measure considers the change in the debt/GDP ratio (as opposed to the level of the debt/GDP ratio) because good fiscal institutions in a given year cannot impact the inherited stock of debt, but can impact the change in debt. Of course, the econometric analysis controls for the initial level of debt and other potential determinants. Similarly to the study of macroeconomic stability, the pre-crisis period (2000-07) is also used for comparison to the preferred sample of 2000-10.

Figure 5 shows developments in general government balance and debt as a per cent of GDP. The trend in general government gross debt has been much more favourable in CESEE countries than in non-CESEE OECD countries. The average ratio of debt to GDP has decreased by more than 20 percentage points between 2000 and 2008 in CESEE countries, whereas it has been stable (or showed just slight decreases) in (other) OECD countries. One reason for this development could be differences in budget balances. However, this is certainly not the case, since the budget balance⁶ was better in non-CESEE OECD countries than in CESEE countries. Therefore, the two measures described at the beginning of this sub-section are not perfectly correlated.

⁶ The primary balance is unfortunately not available for several CESEE countries.

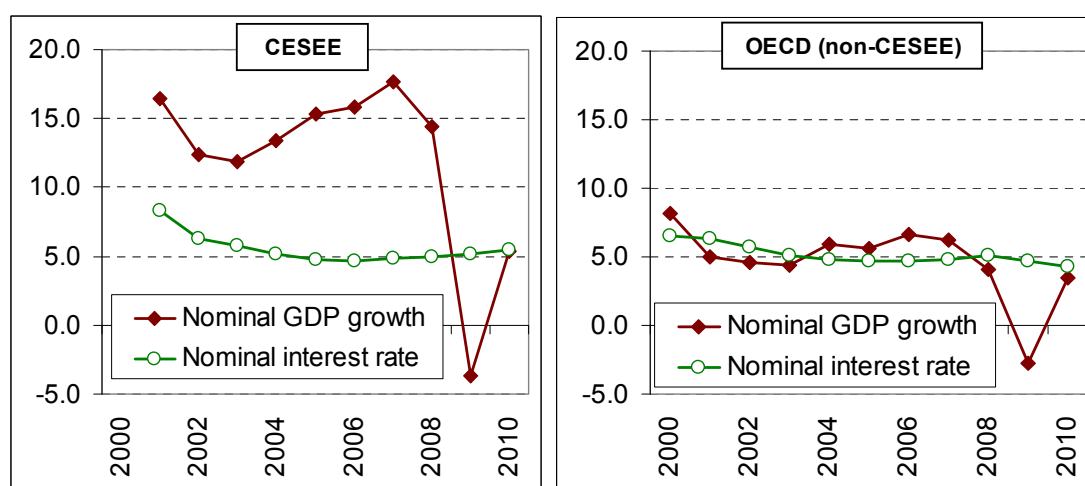
Figure 5. General government balance and gross debt (% GDP), 2000-10



Sources: IMF *World Economic Outlook* April 2010 and EBRD Main macroeconomic indicators.

The explanation for the divergent trends in debt/GDP ratios is most likely the consequence of a highly favourable relationship between the economic growth rate and the interest rate. As Figure 6 indicates, economic growth in CESEE countries largely exceeded the interest rate before the crisis, while in [other] OECD countries the two variables broadly moved together. The favourable relationship in CESEE countries was supported by financial integration (by reducing borrowing costs), higher real GDP growth rates and higher inflation rates⁷.

Figure 6. Implicit nominal interest rate¹ on government debt and nominal GDP growth (per cent), 2000-10



Note: Interest rate=government interest expenditures/previous year gross debt.

Source: Authors' calculations using data from the IMF *World Economic Outlook* April 2010 and Eurostat website (implicit interest rate).

⁷ It should be noted that, during the crisis, the interest rate risk premium has increased and may remain at about pre-crisis levels in the coming years, while nominal GDP growth may be squeezed. Therefore, such a highly favourable relationship between the growth rate and the interest rate may not return. Also, this paper uses the actual implicit interest rate, which is largely determined by past interest rates due to long maturity bonds. A rise in spot interest rates will be shown in the implicit interest rates after a lag.

3. Fiscal institutions

This section identifies budgetary institutions which may contribute to aggregate control and fiscal discipline, and proposes a new index called “Budgetary Discipline Index”. The “Fiscal Institutions Index” of Fabrizio and Mody (2008) and the budgetary institutions indexes of Hallerberg, Strauch and von Hagen (2007) have motivated the development of this Budgetary Discipline Index which nevertheless differs by according more importance to different or additional aspects and by omitting some criteria analysed by the previous authors. This paper develops a set of institutional features which are considered to be crucial for mechanisms of fiscal discipline at the three stages of the budgetary cycle: the preparation stage (when the budget is drafted), the authorisation stage (when the budget is approved by parliament) and the implementation stage (when the budget is implemented and may be amended). The set provides a benchmark for assessing the countries and a basis for constructing the Budgetary Discipline Index.

3.1. Budget preparation stage

For the stage of budgetary preparation, three leading parameters contribute to budgetary control: fiscal rules, the medium-term expenditure framework and multi-annual expenditure estimates.

3.1.1. Fiscal rules

According to the definition of a fiscal rule proposed by Kopits and Symanski (1998, p. 2), a fiscal rule is “a permanent constraint on fiscal policy, typically defined in terms of an indicator of overall fiscal performance. A critical feature of a fiscal rule is that it is intended for application on a permanent basis by successive governments in a given country.”

Fiscal rules can serve different goals, and their role in promoting budgetary control varies. Depending on how they affect fiscal discipline, the rules are classified as follows⁸:

- **Expenditure rules** usually set permanent or medium-term limits on total, primary or current spending in absolute terms, in growth rates, or in per cent of GDP. Expenditure rules in their essence include expenditure frameworks with fixed ceilings (ceilings that cannot be changed from year to year). Expenditure rules are always anchored in a budget balance rule over the cycle (see below). Expenditure rules can provide an operational tool to trigger the required fiscal consolidation consistent with sustainability. Steering on the expenditure side rather than on a cyclically adjusted deficit constraint is more transparent and possibly less susceptible to manipulation (Anderson and Minarik, 2006). Therefore, the largest value is assigned to expenditure rules.
- **Budget balance rules**, which can be set as headline balance and structural (or cyclically adjusted) balance, help to ensure that the debt-to-GDP ratio converges to a finite level. (Sometimes the “balance rule” is referred to as a “deficit rule”.)
 - Headline balance rules have certain disadvantages. The revenue side of the budget is almost entirely determined by substantive legislation, namely tax legislation, and the expenditure side is partly determined by substantive legislation, in particular social security and health legislation (entitlements). This means that forecasts for the actual

⁸ See IMF (2009) for further details.

deficit are permanently moving, not only during the formulation phase of the budget process but also during the execution phase. Focus on the headline balance therefore requires that the budget be amended often during both phases of the budget process to react to the latest predictions. This hampers an orderly decision-making process and tranquillity in the budget numbers. Moreover, it leads to a volatile fiscal stance that changes from month to month in the light of the latest forecasts. Budgetary adjustments motivated by short-term macroeconomic fluctuations bring a pro-cyclical element into budgetary policy and hamper the stabilising effect of the budget (Kraan *et al.*, 2006).

- A structural (or cyclically adjusted) balance rule may solve some issues associated with the headline balance rule and improve the trade-off between concerns about sustainability and cyclical stability. The cyclically adjusted fiscal balance is obtained by removing the cyclical component from the headline fiscal balance. The cyclical component, in turn, depends on two factors: the size of the output gap; and the output elasticity of the tax yield, which indicates the extent to which the tax yield reacts to fluctuations in GDP. However, one disadvantage of a cyclically adjusted deficit constraint is that there are arbitrary elements in the calculation of the output gap on which the cyclically adjusted deficit is based⁹. Moreover, the concept of the cyclically adjusted balance rule is not always transparent to politicians and the public.
- Some variant of cyclically adjusted balance rules is now used by about 11% of countries around the world (IMF, 2009). However, none of the CESEE countries have adopted cyclically adjusted balance rules. Concerns about the accuracy of calculations might be the main reason for the countries' abstinence. Given the relatively high volatility of macroeconomic variables in the CESEE region, it would be difficult to produce an accurate cyclical component. Therefore, this paper does not separate structural and headline balance rules, but rather assigns them the same score (after expenditure rules).
- **Debt rules** set an explicit limit or target for public debt in per cent of GDP. This type of rule is, by definition, the most effective in terms of ensuring convergence to a debt target. However, it does not provide sufficient guidance for fiscal policy when debt is well below its ceiling. Therefore, debt rules score low in the calculation.

A significant proportion of countries frequently combine balance and debt rules, which reflects governments' preferences for rules with a close link to fiscal sustainability.

Finally, the absence of a fiscal rule of any kind does not contribute to fiscal discipline; thus a zero is assigned to the countries with no fiscal rules.

3.1.2. Medium-term expenditure framework

Almost all OECD countries currently work with a medium-term expenditure framework. Most of them adjust the framework from year to year in the light of the previous year's outcomes, new estimates of the consequences of current policies and new political priorities. This framework can be called a flexible one. The major advantage of a flexible framework in comparison to no framework is

⁹ See Figure 3 for an example of the uncertainty of output gap estimates.

that, at the time of budget formulation, the multi-annual consequences of all changes (setbacks and windfalls on the revenue and expenditure sides, and new priorities) have to be traded off against each other and against the adjustment of medium-term targets for expenditures, revenues or the deficit.

A few countries (notably the Netherlands, Sweden and the United Kingdom) have a medium-term expenditure framework that is not adjusted from year to year; this can be called a fixed framework. It is characteristic for a fixed framework that, during budget formulation, all line-item budget numbers and all line-item multi-year estimates have to be squeezed under the overall ceiling over the entire term of the framework. The first major advantage of a fixed expenditure framework in comparison to no framework is identical to that of a flexible framework: all trade-offs have to be considered. A second major advantage is that a fixed framework is (more) effective than a flexible framework in realising multi-year expenditure targets. Precisely because the overall ceiling cannot be changed from year to year, the target is automatically realised as long as the framework is maintained. Although only a few OECD countries work with a fixed expenditure framework, many others seek to keep their expenditure framework as stable as possible from year to year (without formally committing to a fixed framework).

Medium-term expenditure frameworks sometimes contain not only overall ceilings or broad sectoral ceilings for central government, local government or the social security funds, but also ceilings at the level of ministries or expenditure areas. Ministerial ceilings are important because, once established, they impose a certain discipline on ministers and help to prevent overspending.

CESEE countries have also adopted expenditure frameworks in their budgetary process. The frameworks are characterised by different degrees of flexibility. For the purposes of this paper, the highest score was attributed to the countries that have fixed ceilings for the ministries at the very beginning of the budget formulation process and that try to keep them as stable as possible from year to year. If a country has targets which may be substantially changed and renegotiated during the budget drafting process, the country was given a score of zero.

3.1.3. Multi-annual estimates

Multi-annual estimates should be integrated into the annual budget to ensure consistency with the expenditure framework. Multi-annual line-item estimates on the basis of current policy or current law are essential for the allocation of financial resources in the annual budget negotiation, and they help to ensure the consistency of current law or policy with the multi-annual ceilings. Multi-annual estimates on the basis of current policy or current law (“baseline estimates”) should be produced and agreed between the line ministry and the finance ministry at least twice a year. Such estimates are an essential tool for budgetary discipline not only during budget formulation, but also during budget execution: during execution, they alert at an early stage to possible overspending, which may trigger corrective measures.

Establishing the expenditure framework can be seen as a top-down process, and preparing budgetary and multi-annual estimates as a bottom-up process. In fact, the reconciliation of prescriptive targets or ceilings with descriptive line-item estimates is central to a programme-based budget process. Government spending programmes in OECD countries have reached such levels of size and complexity that it is frequently difficult to make policy changes in the current year that substantially affect the next year’s budget.

Therefore, the maximum score was attributed to the countries where multi-annual line-item estimates based on current policy are updated twice or several times per year, a lower score to the countries where multi-annual line-item estimates based on current policy are available at the start of the budget preparation, and zero to the countries where the estimates are prepared on an *ad hoc* basis or are not produced at all.

3.2. Budget authorisation stage (legislation)

In the legislative stage of the budgetary process, parliament can amend the budget bill and either pass or reject it. Two indicators in this second stage are important for promoting fiscal discipline: constraints on parliament to amend the budget bill, and independent assessment of fiscal policy by a fiscal council.

3.2.1. Constraints on parliament to amend the budget bill

The approval stage of the budget cycle serves as an important opportunity for debate of the executive's policy and expenditure priorities. Without intending to study the meaning of political representation or the confidence in the legislature held by civil society, the argument is that a restricted formal amendment power of parliament contributes to better budgetary discipline. If the legislature can only make budget amendments under the condition that the budget balance (surplus or deficit) within the executive's budget proposal is unchanged – or, alternatively, if the legislature can only amend downwards any aggregates of expenditure – the constraints on the executive budget are maintained and the budgetary cycle is not fragmented. This situation will contribute to fiscal discipline. The highest score was attributed to countries where the amendment power of parliament is restricted, and a score of zero to the countries where the legislature may increase or decrease the level of revenues and/or expenditures without the consent of the executive.

3.2.2. Fiscal councils

An independent fiscal agency or a fiscal council can help in the formulation and implementation of sound fiscal policies. Fiscal councils analyse and assess budgetary developments and policies, offer advice, and stimulate public debate and scrutiny while leaving the policy mandate with the elected representatives. Fiscal councils can provide independent input into the budgetary process and contribute to greater transparency by alerting about the political cost of inappropriate policy.

The desirable form of a fiscal council is specific to each country. The best form depends on the nature of a country's political environment, including the constitutional set-up, the legal traditions and the policy-making customs. A fiscal council can complement the role played by existing institutions and enhance the effectiveness of fiscal rules (see Debrun, Hauner and Kumar, 2009).

For the analysis in this paper, only fiscal agencies which are fully independent (or a nonpartisan government agency) and whose role consists in assessing fiscal policy were considered. The premise is that the larger the guarantee of independence from political interference, the greater the likelihood of perceived or actual impact on fiscal outcomes.

3.3. Budget implementation stage

In the third stage, the budget law is executed and further modifications of the law may be possible. Two parameters were selected to indicate the level of budgetary control: the rules for carryovers of unused funds to the next fiscal year, and the quality of external audit.

3.3.1. Carryovers of unused funds

The issue of carryovers of unused funds to the next fiscal year arises in the stage of budgetary execution. Any automatic carryover arrangement, whether cash-based or accruals-based, will lead to stacks of unused appropriations that will increase from year to year. Any general rule limiting carryover will lead to 'December fever'. Therefore, the most sensible solution is bilateral negotiation between the line minister and the finance minister on a case-by-case basis. Under a cash regime, each agreed carryover will have to be compensated in the next budget year and the finance minister should see to that (Kraan, 2007). Therefore, the rules allowing carryovers within certain limits with authorisation of the finance ministry were given the highest score, prohibited carryovers were given an average score, and unlimited carryover rules (which do not contribute to fiscal discipline) were given a value of zero.

3.3.2. Quality of external audit

The quality of external audit is probably the most arbitrary parameter. It encompasses various issues related to external audit, namely the openness and availability of audit reports to the public, timeliness of such publications, the nature of audit reports (for instance, performance audit reports are considered as a more advanced level of auditing with greater outcomes than compliance reports), the mechanism provided for follow-up measures, and some other criteria which can differ depending on countries' circumstances. Therefore, the countries with both financial and performance audits complemented by strong mechanisms for follow-up measures score high in the ranking. A focus on financial audit and/or insufficient use of audit reports indicates an insufficient level of development of audit institutions (zero score).

3.4. Design of the index

Table 1 provides an overview of the design of the Budgetary Discipline Index and indicates the preferred weights.

It should be kept in mind that the study looks at budgetary institutions from the perspective of how well they contribute to the fulfilment of one particular function of the budget: control of spending, taxation and borrowing. Therefore, other functions of the budget – namely the efficient allocation of resources, the cost-efficient management of spending programmes, the democratic authorisation of and accountability for taxation, spending and borrowing – are not considered. This focus determines the set of variables in the construction of the Budgetary Discipline Index. Institutional characteristics that promote co-ordinated and cohesive decision making are expected to be more conducive to fiscal discipline and therefore receive a higher score in the quantitative index used for the empirical analysis.

Table 1. Construction of the Budgetary Discipline Index: index parameters

	Index	Sub-index	Numerical coding
Budget preparation	0.50		
Fiscal rules		0.50	
Expenditure rule			4.00
Budget balance rule			2.67
Debt rule			1.33
None			0.00
Medium-term expenditure framework		0.25	
Multi-annual ceilings are decided at the start of the budget preparation.			4.00
No framework or ceilings may be substantially and frequently changed during the budget preparation.			0.00
Multi-annual line-item expenditure estimates		0.25	
Multi-annual estimates based on current policy are updated twice or several times per year.			4.00
Multi-annual estimates based on current policy are available at the start of the budget preparation.			2.00
There are no multi-annual estimates based on current policy.			0.00
Budget authorisation	0.25		
Constraints on parliament to amend the budget bill		0.50	
Amendments leading to spending increases or decreases of tax revenue are required to be offset by savings or tax increases.			4.00
No constraints.			0.00
Fiscal council		0.50	
There is a fiscal council to assess fiscal policies independently.			4.00
No fiscal council.			0.00
Budget implementation	0.25		
Carryover of unused funds to the next fiscal year		0.50	
Allowed within certain limits with authorisation of the finance ministry.			4.00
Not permitted.			2.00
Unlimited.			0.00
Quality of external audit		0.50	
Financial and performance audits with detailed scrutiny completed by strong mechanisms for follow-up measures.			4.00
Focus on financial audit and/or insufficient use of audit reports.			0.00

Note: By construction, the index can take values between zero and four.

3.5. Data

Limited availability of data on CESEE countries restricts the research, and the major concern is that the data do not always contain enough information to enable solid conclusions to be drawn. Two main sources have been used: OECD budget reviews (www.oecd.org/gov/budget) and the OECD *International Budget Practices and Procedures Database 2007/08* (www.oecd.org/gov/budget/database).

The objective of the budget reviews is to provide a comprehensive overview of the budget process in the country under examination, to evaluate national experiences in the light of international best practice and to provide specific policy recommendations, as well as to offer other countries an opportunity to comment on specific budgeting issues in the country under examination ('peer review')¹⁰. The reviews look at the budget institutions or the rules of the budget process and the way they function. Therefore, the budget reviews provided the required facts and analyses of institutional features in CESEE countries.

The *International Budget Practices and Procedures Database* is a database maintained by the OECD¹¹. Therefore, the Budgetary Discipline Index calculated here is a snapshot of the situation between 2007 and 2008. The index does not reflect emerging trends or reforms since 2008, or the general economic slowdown. For instance, all the progress achieved in such countries as Hungary (introduction of advanced fiscal rules and a fiscal council) is not reflected in this paper.

3.6. Results

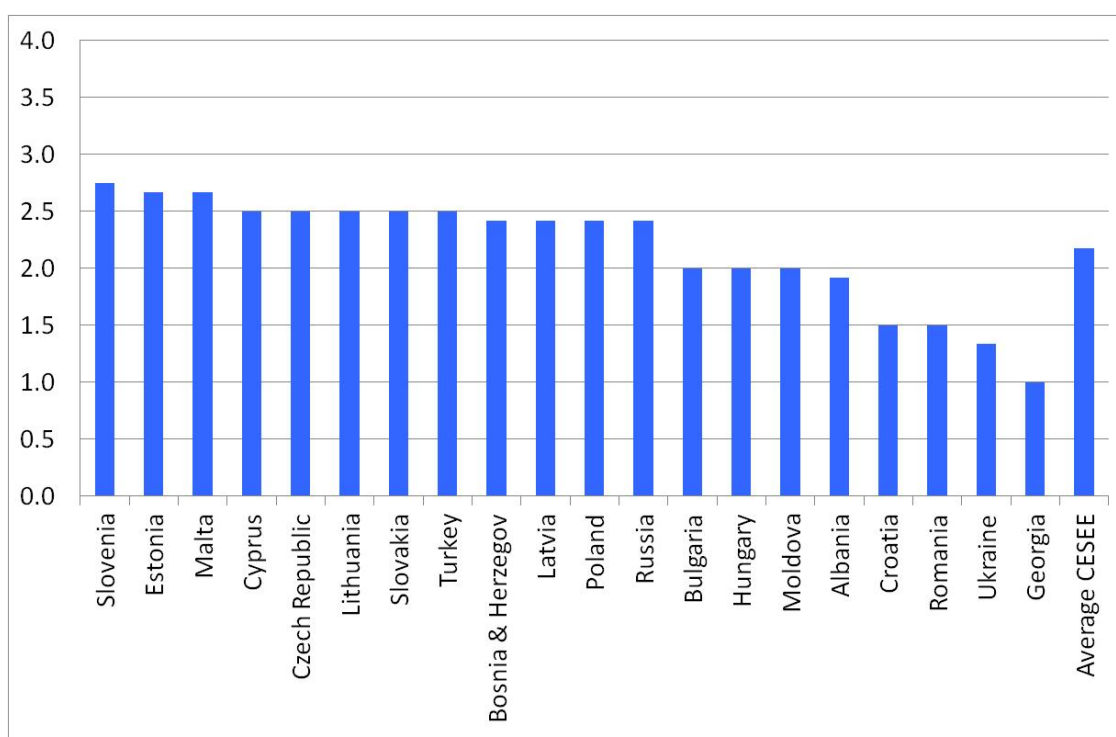
On the basis of the premises and parameters discussed in the previous sub-section, a quantitative Budgetary Discipline Index was constructed for 20 CESEE countries for which data were available: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Georgia, Hungary, Latvia, Lithuania, Malta, Moldova, Poland, Romania, the Russian Federation, the Slovak Republic, Slovenia, Turkey and Ukraine. For comparative reasons, the same indices were created for OECD countries. Figures 7 and 8 show the overall index for CESEE and OECD countries¹² (the OECD countries do not include the ones which are also CESEE countries: Czech Republic, Hungary, Poland, Slovak Republic and Turkey). Tables 2 and 3 detail the calculations.

¹⁰ The following countries have been reviewed: Romania and Slovenia in 2005; Croatia, Georgia and Hungary in 2006; Turkey in 2007; Estonia and the Russian Federation in 2008; Bulgaria and Latvia in 2009, Lithuania and Moldova in 2010.

¹¹ It contains among other things the results of the 2007 OECD survey of budget practices and procedures in OECD countries and the 2008 World Bank/OECD survey of budget practices and procedures in Asia and other regions. Information on budget institutions from 97 countries is available including the 31 OECD member countries and 66 non-member countries. The data refer to the years 2007 and 2008.

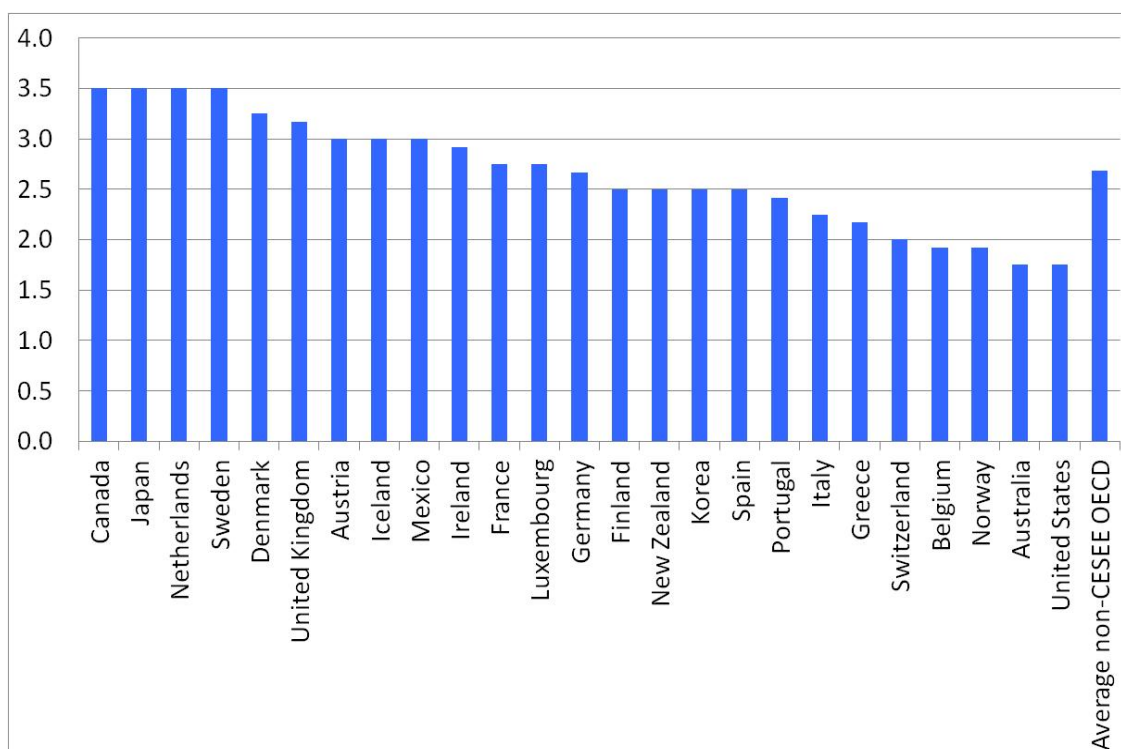
¹² Estonia and Slovenia were not member countries of the OECD in 2008, but joined the Organisation later.

Figure 7. Budgetary Discipline Index for CESEE countries (2007/08)



Source: Authors' calculations based on OECD budget reviews and the OECD *International Budget Practices and Procedures Database*.

Figure 8. Budgetary Discipline Index for non-CESEE OECD countries (2007/08)



Source: Authors' calculations based on OECD budget reviews and the OECD *International Budget Practices and Procedures Database*.

Among CESEE countries, there is a relatively large disparity in terms of scores. Globally, EU member countries have higher scores than non EU members, with the notable exception of Romania scoring relatively low. Slovenia, Estonia and Malta had the strongest budgetary institutions at the time. Overall, countries which adopted fiscal rules score the highest in the ranking.

By comparing the indices of CESEE countries (Figure 7) with the indices of OECD countries (Figure 8), the OECD indices appear to be generally higher, and the average index among OECD countries (2.7) is significantly higher than the average index in CESEE countries (2.2). However, there is a relatively large heterogeneity among OECD countries as well, and some OECD countries – namely the United States, Australia, Norway, Belgium and Switzerland – show relatively low rates.

The low scores in some OECD countries might be due to the fact that this paper looks at the legal framework of a country (at the central level) and coalition agreements to examine the presence and the nature of fiscal rules and expenditure frameworks. The fact that some countries (for example, Australia, Norway or the United States) have long-standing customs which are not necessarily reflected in the legislation is not taken into consideration. Therefore, even if these countries have no legal provisions regarding fiscal control measures, they may have other strong tools to promote aggregated budgetary control.

Table 2. Budgetary Discipline Index for CESEE countries

	Index	Subindex	Numerical Coding	Albania	Bosnia & Herzegovina	Bulgaria	Croatia	Cyprus	Estonia	Georgia	Hungary	Czech Republic	Latvia	Lithuania	Malta	Moldova	Poland	Romania	Russia	Slovakia	Slovenia	Ukraine	Turkey	Average CESEE
Budget preparation	0.50																							
Fiscal rules		0.50																						
Expenditure rule			4.00			1		1				1		1						1	1			
Budget balance rule			2.67	1	1				1				1		1		1		1					
Debt rule			1.33																			1		
None			0.00				1			1	1					1	1						1	
Score				2.67	2.67	4.00	0.00	4.00	2.67	0.00	0.00	4.00	2.67	4.00	2.67	0.00	2.67	0.00	2.67	4.00	4.00	1.33	0.00	2.20
Medium Term Expenditure Framework		0.25																						
Multi-annual ceilings are decided at the start of the budget preparation			4.00		1	1	1	1	1	1	1	1		1	1	1		1		1	1		1	
No framework or ceilings may be substantially and frequently changed during the budget preparation			0.00	1									1				1		1			1		
Score				0.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	4.00	4.00	0.00	4.00	0.00	4.00	4.00	0.00	4.00	3.00
Multi-annual line-item expenditure estimates		0.25																						
Multi-annual estimates based on current policy are updated twice or several times per year			4.00								1	1			1		1			1			1	
Multi-annual estimates based on current policy are available at the start of the budget preparation			2.00			1	1	1	1	1			1	1		1		1	1		1			
There are no multi-annual estimates based on current policy			0.00	1	1																	1		
Score				0.00	0.00	2.00	2.00	2.00	2.00	2.00	4.00	4.00	2.00	2.00	4.00	2.00	4.00	2.00	2.00	4.00	2.00	0.00	4.00	2.30
Score for budget preparation				1.34	2.34	3.50	1.50	3.50	2.84	1.50	2.00	4.00	1.84	3.50	3.34	1.50	2.34	1.50	1.84	4.00	3.50	0.67	2.00	2.43
Budget approval	0.25																							
Constraints on Parliament to amend the budget bill		0.50																						
Amendments leading to spending increases or decreases of tax revenue are required to be offset by savings or tax increases			4.00	1	1		1	1	1			1	1	1		1	1	1	1		1	1	1	
No constraints			0.00			1				1	1				1					1				
Score				4.00	4.00	0.00	4.00	4.00	4.00	0.00	0.00	4.00	4.00	4.00	0.00	4.00	4.00	4.00	4.00	0.00	4.00	4.00	4.00	3.00
Fiscal Council		0.50																						
There is a fiscal council to assess fiscal policies independently			4.00																					
No fiscal council			0.00	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Score				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Score for budget approval				2.00	2.00	0.00	2.00	2.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	1.50
Budget implementation	0.25																							
Carryover of unused funds to next fiscal year		0.50																						
Allowed within certain limits with authorisation of the Ministry of Finance			4.00								1		1		1				1		1		1	
Not permitted			2.00	1	1	1	1	1	1	1				1		1	1	1						
Unlimited			0.00									1								1		1		
Score				2.00	2.00	2.00	2.00	2.00	2.00	2.00	4.00	0.00	4.00	2.00	4.00	2.00	2.00	2.00	4.00	0.00	4.00	0.00	4.00	2.30
Quality of external audit		0.50																						
Financial and performance audit with detailed scrutiny completed by strong mechanisms for follow up measures			4.00	1	1				1		1		1		1	1	1		1	1		1	1	
Focus on financial audit and/or insufficient use of audit reports			0.00			1	1	1		1		1						1			1			
Score				4.00	4.00	0.00	0.00	0.00	4.00	0.00	4.00	0.00	4.00	0.00	4.00	4.00	4.00	0.00	4.00	4.00	0.00	4.00	4.00	2.40
Score for budget implementation				3.00	3	1	1	1	3	1	4	0	4	1	4	3	3	1	4	2	2	2	4	2.35
Overall index				1.92	2.42	2.00	1.50	2.50	2.67	1.00	2.00	2.50	2.42	2.50	2.67	2.00	2.42	1.50	2.42	2.50	2.75	1.33	2.50	2.18

Source: Authors' calculations based on OECD budget reviews and the OECD *International Budget Practices and Procedures Database*.

Table 3. Budgetary Discipline Index for non-CESEE OECD countries

	Index	Subindex	Numerical Coding	Australia	Austria	Belgium	Canada	Denmark	Finland	France	Germany	Greece	Iceland	Ireland	Italy	Japan	Luxembourg	Mexico	Netherlands	New Zealand	Norway	Portugal	Korea	Spain	Sweden	Switzerland	United Kingdom	United States	Average non-CESEE	
Budget preparation		0.50																												
Fiscal rules		0.50																												
Expenditure rule			4.00		1		1	1	1	1			1		1	1	1	1	1					1	1	1				
Budget balance rule			2.67			1					1	1		1							1	1						1		
Debt rule			1.33																											
None			0.00	1																1			1					1		
Score			0.00	4.00	2.67	4.00	4.00	4.00	4.00	4.00	2.67	2.67	4.00	2.67	4.00	4.00	4.00	4.00	4.00	0.00	2.67	2.67	0.00	4.00	4.00	4.00	2.67	0.00	2.99	
Medium Term Expenditure Framework		0.25																												
Multi-annual ceilings are decided at the start of the budget preparation			4.00		1			1	1	1	1		1	1		1	1	1	1	1			1		1	1	1			
No framework or ceilings may be substantially and frequently changed during the budget preparation			0.00																											
Score			0.00	4.00	0.00	0.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	0.00	0.00	4.00	0.00	4.00	4.00	4.00	4.00	0.00	2.56
Multi-annual line-item expenditure estimates		0.25																												
Multi-annual estimates based on current policy are updated twice or several times per year			4.00		1	1	1	1			1		1		1	1	1		1	1					1		1	1		
Multi-annual estimates based on current policy are available at the start of the budget preparation			2.00						1	1			1										1	1	1		1			
There are no multi-annual estimates based on current policy			0.00																											
Score			4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	4.00	2.00	4.00	2.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	2.00	2.00	2.00	4.00	2.00	4.00	4.00	4.00	3.28
Score for budget preparation			1.00	4.00	2.34	3.00	4.00	3.50	3.50	3.34	1.84	4.00	2.84	3.00	4.00	4.00	4.00	3.50	4.00	2.00	2.34	1.84	1.50	2.50	4.00	3.50	3.34	1.00	2.95	
Budget approval		0.25																												
Constraints on Parliament to amend the budget bill		0.50																												
Amendments leading to spending increases or decreases of tax revenue are required to be offset by savings or tax increases			4.00																											
No constraints			0.00		1	1		1	1		1		1		1		1		1	1		1		1		1	1		1	
Score			4.00	0.00	0.00	4.00	0.00	0.00	4.00	0.00	4.00	0.00	4.00	0.00	4.00	0.00	4.00	4.00	4.00	4.00	0.00	0.00	4.00	4.00	0.00	0.00	4.00	0.00	1.92	
Fiscal Council		0.50																												
There is a fiscal council to assess fiscal policies independently			4.00			1	1	1											1	1			1		1			1		
No fiscal council			0.00	1	1				1	1	1	1	1	1	1	1	1				1	1		1		1	1			
Score			0.00	0.00	4.00	4.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	4.00	0.00	0.00	4.00	4.00	0.00	4.00	0.00	0.00	4.00	1.44	
Score for budget approval			2.00	0.00	2.00	4.00	2.00	0.00	2.00	0.00	2.00	0.00	0.00	2.00	0.00	2.00	0.00	4.00	4.00	2.00	0.00	2.00	4.00	2.00	2.00	0.00	2.00	2.00	2.00	1.68
Budget implementation		0.25																												
Carryover of unused funds to next fiscal year		0.50																												
Allowed within certain limits with authorisation of the Ministry of Finance			4.00		1		1				1		1	1		1				1		1			1		1			
Not permitted			2.00	1		1		1	1			1			1		1	1			1		1	1	1		1		1	
Unlimited			0.00							1										1										
Score			2.00	4.00	2.00	4.00	2.00	2.00	0.00	4.00	2.00	4.00	4.00	2.00	4.00	2.00	2.00	0.00	4.00	2.00	4.00	2.00	2.00	4.00	2.00	4.00	2.00	4.00	2.00	2.64
Quality of external audit		0.50																												
Financial and performance audit with detailed scrutiny completed by strong mechanisms for follow up measures			4.00																											
Focus on financial audit and/or insufficient use of audit reports			0.00	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	
Score			4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	0.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.52
Score for budget implementation			3.00	4.00	1.00	4.00	3.00	3.00	2.00	4.00	3.00	4.00	4.00	4.00	3.00	4.00	3.00	1.00	2.00	4.00	3.00	4.00	3.00	3.00	4.00	1.00	4.00	3.00	3.08	
Overall index				1.75	3.00	1.92	3.50	3.25	2.50	2.75	2.67	2.17	3.00	2.92	2.25	3.50	2.75	3.00	3.50	2.50	1.92	2.42	2.50	2.50	3.50	2.00	3.17	1.75	2.67	

Source: Authors' calculations based on OECD budget reviews and the OECD *International Budget Practices and Procedures Database*.

4. Monetary institutions

Four measures of monetary institutions are used:

- exchange rate regime
- central bank independence
- central bank transparency
- financial regulation and supervision

The importance of these factors and their relation to monetary institutions are explained in the following sub-sections.

4.1. Exchange rate regime

The nature of the exchange rate regime is the dominant determinant of monetary institutions. Table 4 indicates a wide diversity of exchange rate regimes, both across countries and over time. It is interesting to observe that sometimes even countries with similar circumstances often opted for different regimes: for example, the Czech Republic (float) and Slovakia (euro); Romania (float) and Bulgaria (currency boards); Serbia and Albania (float) and the other four western Balkan countries (various kinds of fixed exchange rates). This diversity suggests that it could be quite difficult to identify the reasons behind exchange rate regime choices apart from, for example, market-forced exit from pegs such as the move of the Czech Republic in 1997, the Russian Federation in 1998, Turkey in 2002, or Ukraine in late 2008.

Another interesting observation is the disappearance of intermediate regimes. While in the 1990s several countries adopted crawling or horizontal bands, these regimes have passed, and there are more countries with either (more or less) freely floating exchange rate regimes or currency pegs. This finding is in line with global trends. Yet it is also important to note that, while several countries moved from a peg to a float, only two countries so far have moved in the opposite direction (Bulgaria and Slovakia). Finally, it is also interesting to observe that even neighbouring countries move away from United States dollar pegs.

Table 4. Exchange rate arrangements in CESEE countries, 1996-2009

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
EU members	Bulgaria	Floating	Currency board, DM	Currency board, EUR											
	Czech Rep.	Band 65% DM, 35% USD +/- 7.5%	Floating												
	Cyprus	ECU/Euro peg								ERM-II, narrow band		Euro			
	Estonia	Currency board to DM				Currency board to EUR		ERM-II, Currency board							
	Hungary	Crawling band, +/- 2.25%, 30% USD &: 70% ECU 70% DM 70% EUR			Crawling band, EUR +/- 2.25%		EUR band +/- 15%					Floating			
	Latvia	Peg to SDR, +/- 1%									Peg €	ERM-II +/- 1%			
	Lithuania	Currency board to USD				Currency board to EUR		ERM-II, Currency board							
	Malta	Peg to a basket of ECU/Euro, USD, and GBP								ERM-II, narrow band		Euro			
	Poland	Crawling band 45% USD, 35% DM, 10% GBP, 5% FFR, 5% CHF +/- 7%			55% EUR, 45% USD +/- 12.5%		Floating								
	Romania	Floating													
	Slovakia	60% DM, 40% USD band +/- 3% +/- 5%		+/- 7%		Floating						ERM-II +/- 15%, de facto float with revaluations		Euro	
Slovenia	Managed floating, de facto peg or crawling peg to DM/Euro								ERM-II narrow band		Euro				
EU candidates	Albania	Floating (1992.07. -)													
	Bosnia and Hercegovina	Currency board to DM		Currency board to Euro											
	Croatia	Managed floating		Managed floating, de facto peg to EUR											
	Macedonia, FYR	de facto peg to the DM/EUR													
	Montenegro	Peg DM				Euroization									
	Serbia	Peg DM				Managed floating									
	Turkey	Crawling peg to a basket			Peg to a basket		Floating								
Neighbourhood	Azerbaijan	Peg to USD									Crawling peg	Euro-dollar basket			
	Armenia	Floating													
	Belarus	Peg to USD				Crawling band/managed against the RUB, later USD as well							Basket		
	Moldova	Peg to USD									Managed floating				
	Russia	USD		Floating											
	Ukraine	Peg or de facto peg to USD												Floating	

	Peg/band to USD	Peg/band to a basket	Peg/band to DM/Euro	ERM-II	Euro	Float
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Sources: For EU member states: updated from Szapáry (2009). For other countries: IMF and central bank reports.

Have exchange rate regimes played a role in macroeconomic developments? Table 5 presents rough evidence that they may have. Countries with fixed exchange rate regimes had higher macroeconomic volatility, larger current account deficits, higher inflation, faster credit growth, and a higher share of finance and real estate sectors in FDI inflows.

For catching-up economies, the adoption of fixed exchange rate regimes carries a risk (see, for example, Darvas and Szapáry, 2008). When the exchange rate is fixed, price level convergence –

which accompanies economic catching-up – translates into higher inflation. (In floating exchange rate countries, nominal exchange rate appreciation can also accommodate price level convergence.) But when the exchange rate peg is credible, nominal interest rates decline, and borrowers are also more willing to take foreign currency loans because they do not observe the exchange rate risk. But higher inflation and low interest rates (either domestic currency interest rates, or foreign currency interest rates) fuel credit booms which can lead to real estate booms and overheating of the economy, which in turn raise inflation above its equilibrium value, leading to a vicious circle. All these factors can lead to a misallocation of capital and labour.

Table 5. Exchange rate regimes and main macroeconomic developments

	GDP volatility	Current account balance/GDP (%), 2008	Inflation, 2008	Credit/GDP: % change from 2004 to 2008	Foreign direct investment to finance and real estate sectors (% of total FDI), 2007
Floaters	3.7	-7.8	7.8	20	26
Fixers	4.7	-12.3	11.1	36	40

Source: Authors' calculations using data from the IMF (first four indicators) and wiiw (sectoral composition of FDI).

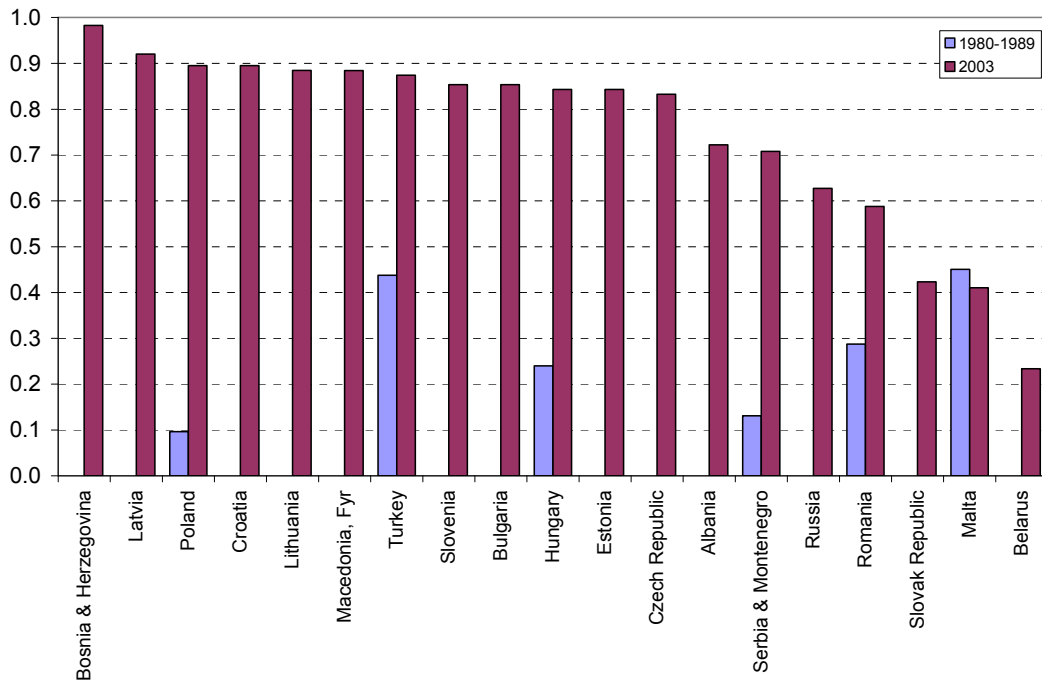
However, it also has to be emphasised that a floating exchange rate regime is not a panacea. For example, Hungary (a floating exchange rate country) was the first to turn to the IMF for help after the collapse of Lehman Brothers. Romania and Serbia, two other floating rate countries, also had to rely on an IMF financing programme. Therefore, while the evidence in Table 5 is telling, other factors should be at work in addition to the exchange rate regime.

4.2. Central bank independence

Central bank independence is an important metric of monetary institutions. In a seminal work, Kydland and Prescott (1977) developed a model of the so-called time inconsistency problem. Central bankers not isolated from political pressures would have ended up running inflationary policies without being able to boost the economy, which probably characterised a couple of central banks in the 1970s when inflation was high and growth was low in advanced countries. Solutions to the problem of time inconsistency were offered by Rogoff (1985) and Walsh (1995): either hiring a central banker who is strongly opposed to inflation or giving the central banker incentives to keep inflation as low as possible. Since then, a consensus has developed that the central bank's management has to be isolated from the government.

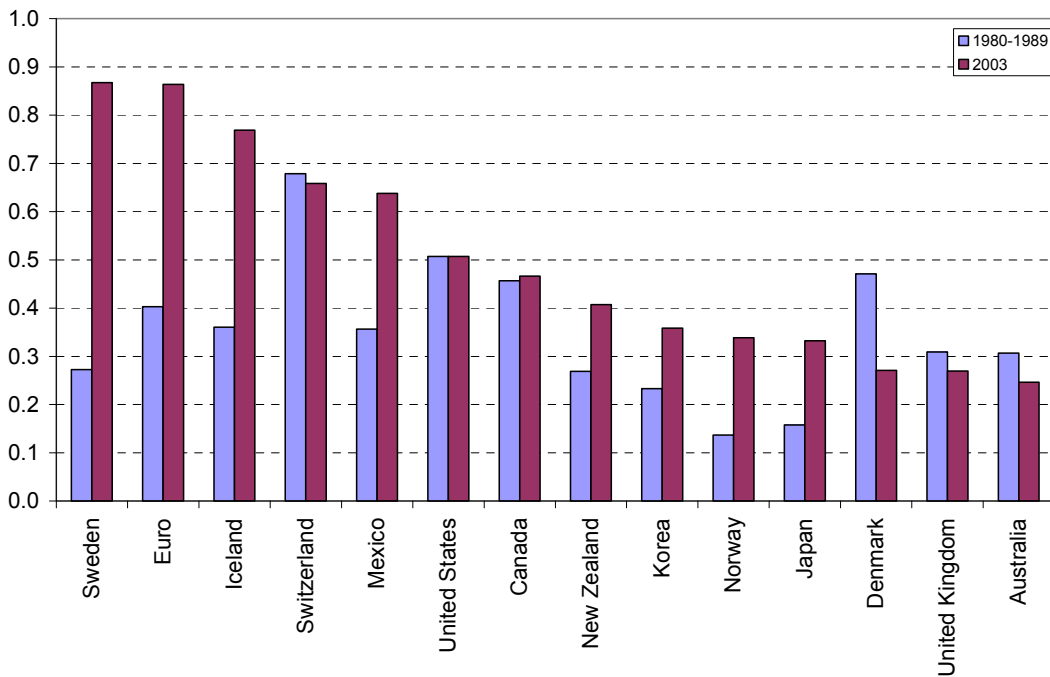
The literature has developed ways to measure central bank independence. This paper uses the index developed by Cukierman, Webb, and Neyapti (1992) which has been updated by Crowe and Meade (2007). Unfortunately, the most recent year for which this index is available is 2003. Figures 9 and 10 below show the 2003 value in comparison to the average of 1980-99 whenever available. CESEE countries rank reasonably well along this metric, and most of them have even more independent central banks than non-CESEE OECD countries.

Figure 9. Central bank independence in CESEE countries



Source: Crowe and Meade (2007)

Figure 10. Central bank independence in non-CESEE OECD countries



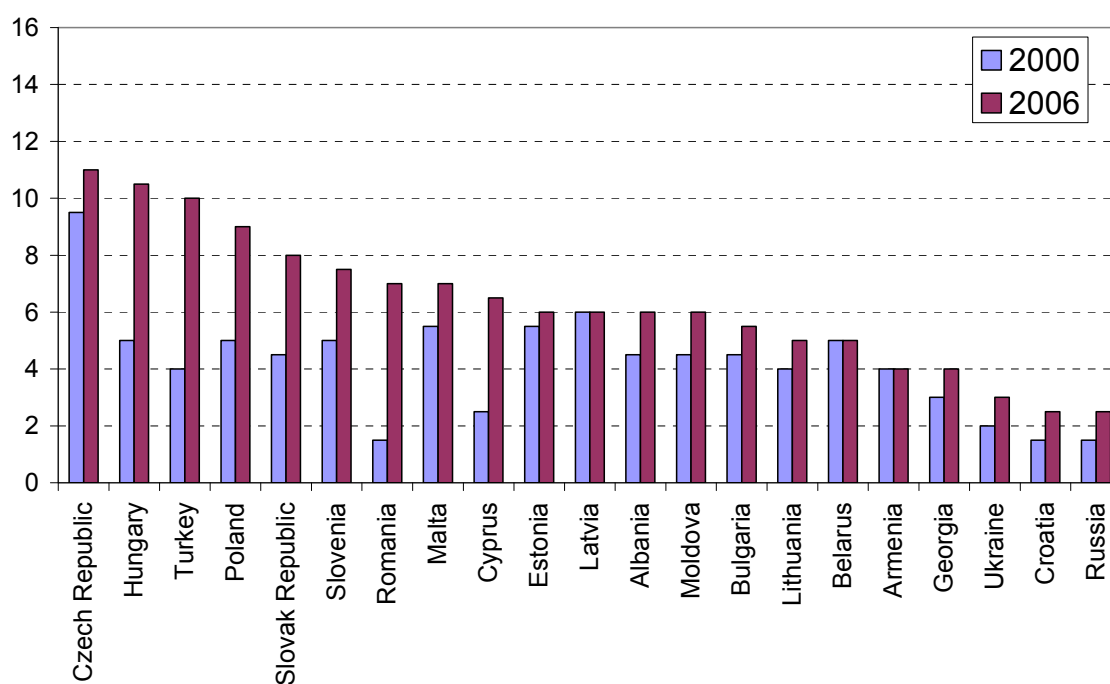
Source: Crowe and Meade (2007)

4.3. Central bank transparency

In addition to central bank independence, central bank transparency also plays an important role in improving monetary policy making. A major change in conduct of monetary policy over the last twenty years has been improvements in transparency (Dincer and Eichengreen, 2007, 2009; Geraats, 2006, 2008, 2009). Transparency of monetary policy refers to the absence of information asymmetries between monetary policy makers and the private sector. A higher degree in transparency should allow economic agents to interpret central bank policies and hence to better align their decisions with those of the central bank and forecast more accurately the time path of relevant variables. Dincer and Eichengreen (2007) have shown that a higher degree of transparency seems to be positively correlated with the higher level of stability of a country and with a more advanced stage of development of financial markets.

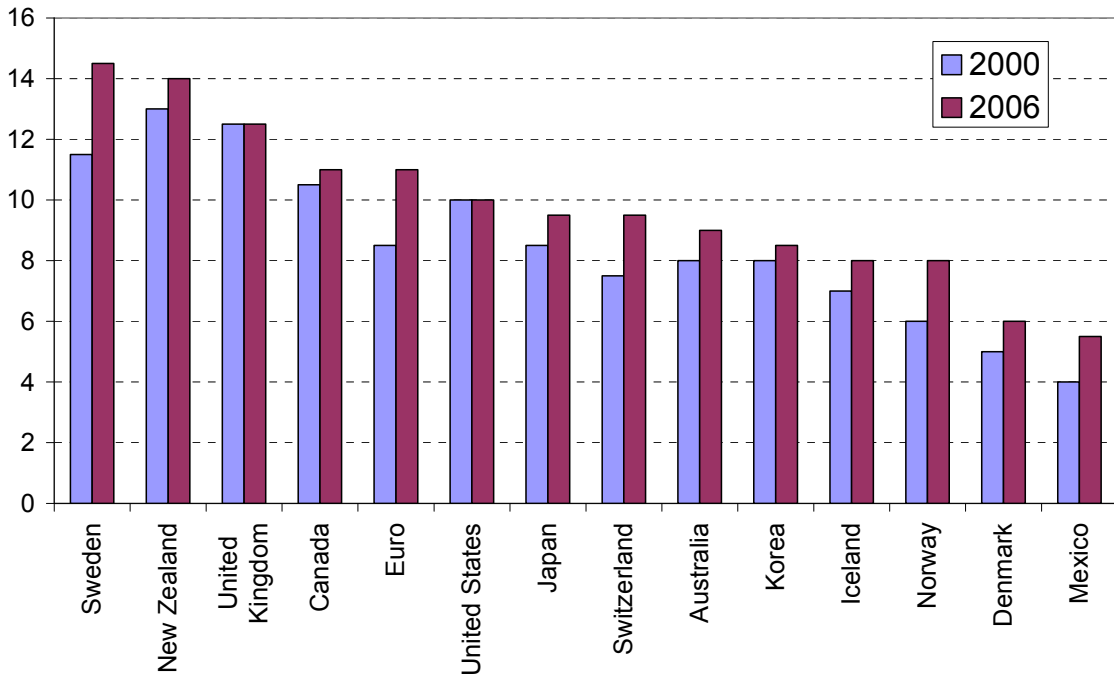
This study uses the index developed by Dincer and Eichengreen (2007). Figure 11 shows the transparency index for 2000 and 2006. Improvements can be observed in some CESEE countries, but several of these countries still have a large gap compared to OECD countries (Figure 12).

Figure 11. Central bank transparency in CESEE countries



Source: Dincer and Eichengreen (2007)

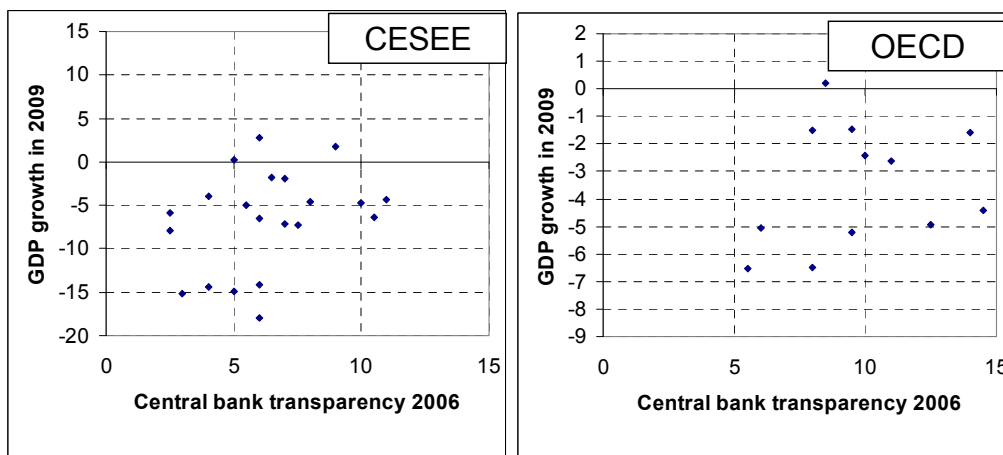
Figure 12. Central bank transparency in non-CESEE OECD countries



Source: Dincer and Eichengreen (2007)

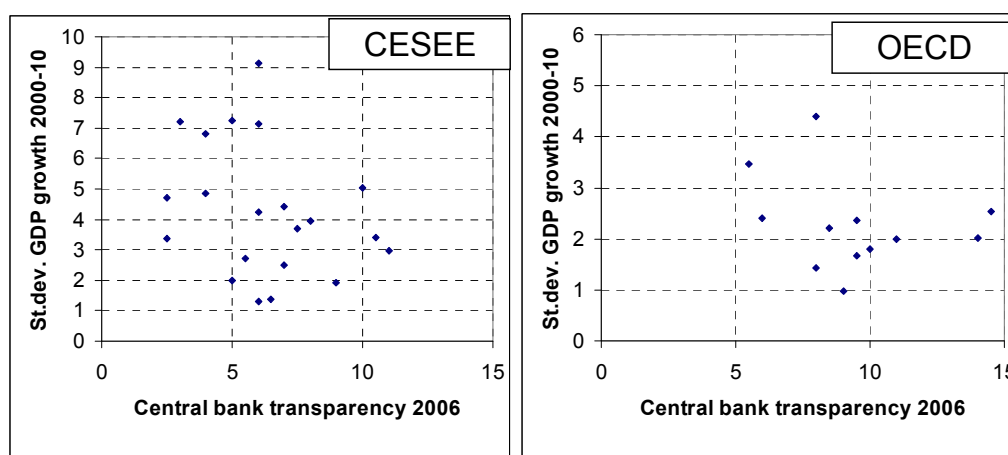
Figures 13 and 14 reveal that central bank transparency correlates well with both the 2009 GDP developments and the GDP volatility during 2000-10.

Figure 13. Central bank transparency versus GDP growth in 2009



Source: authors' calculations based on data from Dincer and Eichengreen (2007) and IMF World Economic Outlook April 2010.

Figure 14. Central bank transparency versus GDP volatility



Source: authors' calculations based on data from Dincer and Eichengreen (2007) and IMF World Economic Outlook April 2010.

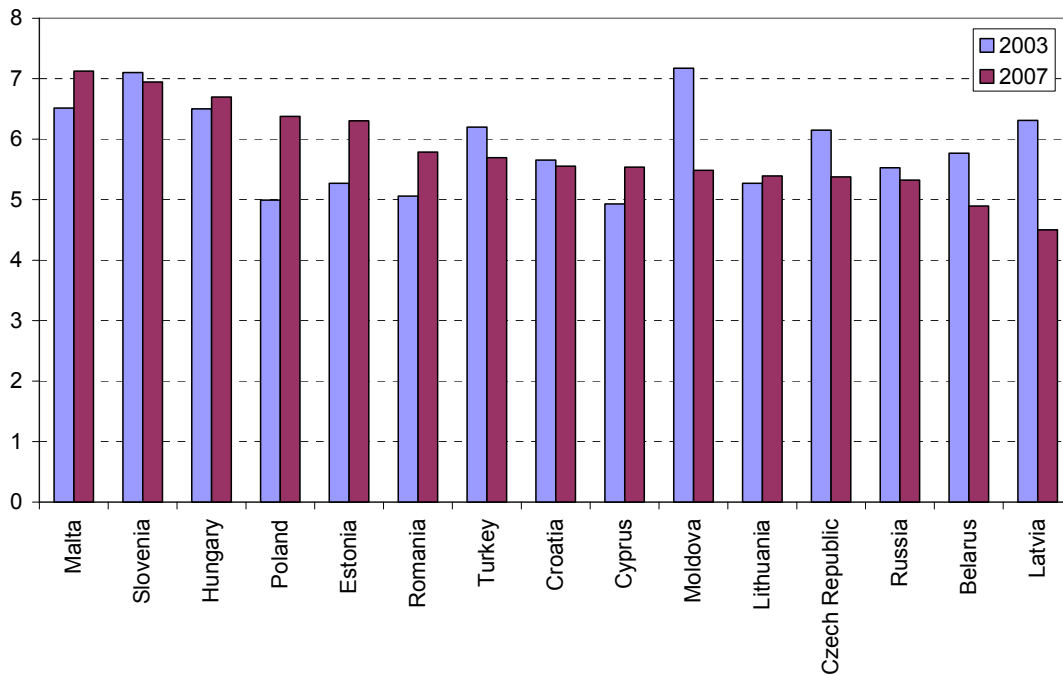
4.4. Financial regulation and supervision

Financial regulation and supervision are crucial elements of the macroeconomic policy mix, and essential complements to monetary policy. The crisis has indicated that the combination of lax monetary policy with lax financial regulation and supervision may lead to financial excesses and unsustainable booms.

Unfortunately, it is extremely difficult to measure the 'quality' of financial regulation because it has so many dimensions (see, for example, Hilbers *et al.*, 2005). Also, in an integrated market, domestic financial regulation may not be very effective after all. On average, 70% of the domestic banking systems in CESEE countries are owned by mostly western European banking groups (Berglöf *et al.*, 2009) and, under free capital mobility, domestic regulations could be circumvented.

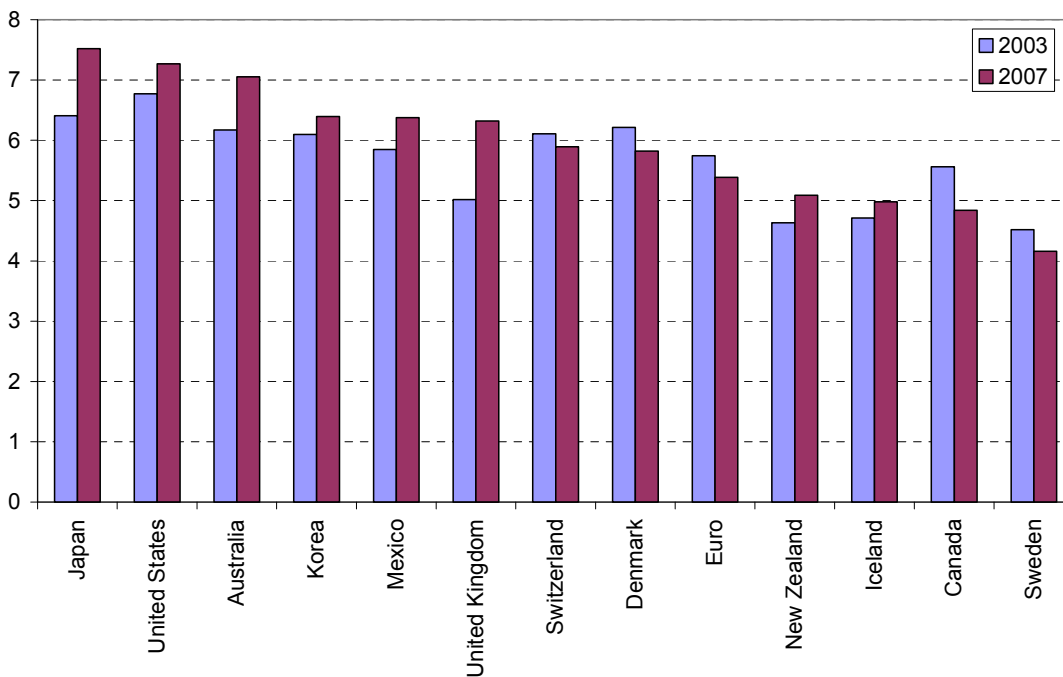
A set of indicators to measure regulation and supervision has been developed by Barth, Caprio and Levine (2008). Figures 15 and 16 report their results. On average, CESEE countries do not lag behind OECD countries, though there is heterogeneity within the region; and while some countries improved from 2003 to 2007, others fell behind.

Figure 15. Quality of financial regulation and supervision in CESEE countries



Source: Barth, Caprio and Levine (2008)

Figure 16. Quality of financial regulation and supervision in non-CESEE OECD countries

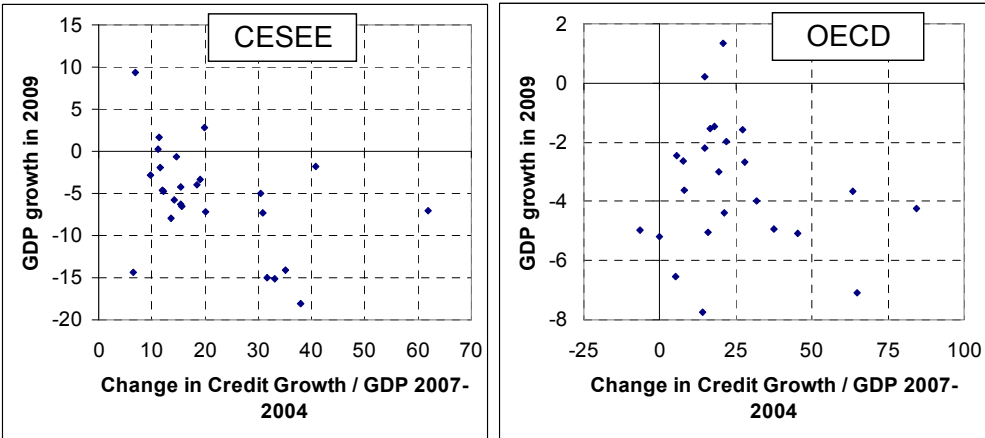


Source: Barth, Caprio and Levine (2008)

However, the assessment of financial regulation and supervision is complicated by the fact that the lack of strict financial regulation has led to unsustainable credit booms in certain countries, but

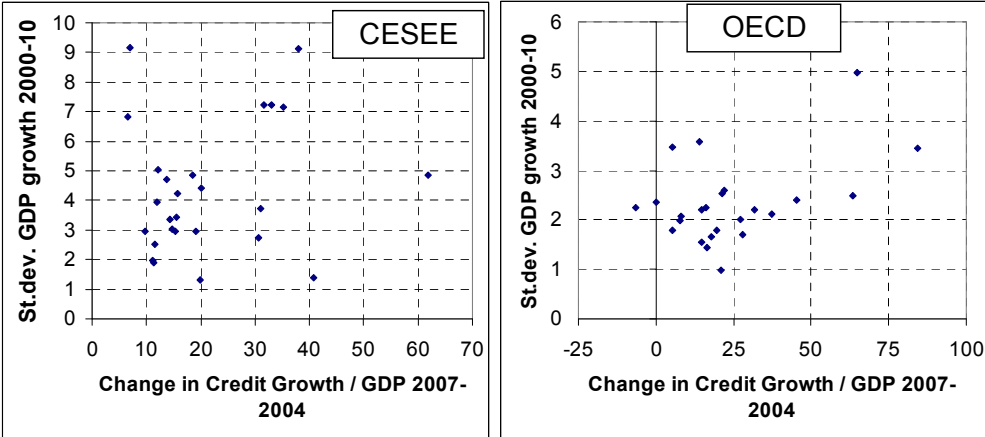
not in others. These differing outcomes could most likely be explained by the appropriateness of other elements of the macroeconomic policy mix. To put it another way, one cannot claim that the lack of strict regulation and supervision was a policy mistake. One can only claim that it was a likely policy mistake in countries in which credit growth reached extraordinarily high levels. Not surprisingly, the pre-crisis speed of credit growth correlates strongly with pre-crisis current account imbalances and also with output falls in 2009 in CESEE countries, as Figure 17 indicates. The correlation in non-CESEE OECD countries is weaker, but this is not surprising since there were just a few non-CESEE OECD countries that followed a growth model similar to that of CESEE countries, like the Mediterranean euro area members. The correlation of pre-crisis credit growth and GDP volatility reveals a similar relationship (Figure 18).

Figure 17. Credit growth in 2004-07 versus GDP growth in 2009



Source: authors' calculations based on data from IMF World Economic Outlook April 2010 and International Financial Statistics

Figure 18. Credit growth in 2004-07 versus GDP volatility



Source: authors' calculations based on data from IMF World Economic Outlook April 2010 and International Financial Statistics

For the reasons previously discussed, this paper uses both the index derived by Barth, Caprio and Levine (2008) and the actual speed of credit growth from 2003 to 2007 as a proxy of proper regulation and supervision.

5. Econometric analysis

Having established certain measures of fiscal and monetary institutions in the previous sections, this section presents formal econometric models for studying the impact of these institutions on macroeconomic stability and budgetary control.

5.1. Macroeconomic stability

As indicated in Section 2.2, two measures of macroeconomic stability are used for the econometric analysis: volatility of GDP growth rates (for two periods: 2000-07 and 2000-10) and output decline in 2009. The regression framework adopted is the following:

$$[1] \quad \log(\sigma_i^y) = \alpha + \beta \text{mon.inst.}_i + \gamma \text{fisc.inst.}_i + \delta' \text{controls}_i + v_i$$

$$[2] \quad \Delta y_{2009} = \alpha + \beta \text{mon.inst.}_i + \gamma \text{fisc.inst.}_i + \delta' \text{controls}_i + v_i$$

where $\log(\sigma_i^y)$ denotes the logarithm of GDP volatility (a logarithmic transformation is adopted in order to ensure that the fitted volatility will be positive), Δy_{2009} denotes the real change in GDP in 2009, mon.inst._i denotes a measure of monetary institutions, fisc.inst._i denotes a measure of fiscal institutions, controls_i denotes a set of control variables, and v_i denotes the error term. Cross-section regressions are run, and therefore there is no time dimension in the regression.

For fiscal institutions, the Budgetary Discipline Index is used. For monetary institutions, the four indicators discussed in Section 4 are used: exchange rate regime; central bank independence¹³; central bank transparency; and financial regulation and supervision, as well as credit growth (which is used as a proxy for financial regulation and supervision). In addition, various controls have been used that can impact macroeconomic volatility: volatility of terms of trade, trade openness, GDP per capita, government expenditures/GDP, debt/GDP, pre-crisis speed of credit growth, and the overall institutional quality index of the World Economic Forum¹⁴.

Table 6 shows the Ordinary Least Squares (OLS) estimation results. The columns of the table correspond to different regressions. The rows of the table indicate the variables included in a

¹³ For the first 12 members of the euro area, central bank transparency relates to the European Central Bank (ECB). Countries in the euro area have been excluded because of the large divergences within the euro area in terms of various indicators, including fiscal ones.

¹⁴ The "Quality of Institutions Index" of the World Economic Forum is the average of 19 sub-indices: property rights, intellectual property protection, diversion of public funds, public trust of politicians, judicial independence, favouritism in decisions of government officials, wastefulness of government spending, burden of government regulation, efficiency of legal framework in settling disputes, efficiency of legal framework in challenging regulations, transparency of government policy making, business costs of terrorism, business costs of crime and violence, organised crime, reliability of police services, ethical behaviour of firms, strength of auditing and reporting standards, efficacy of corporate boards, and protection of minority shareholders' interests.

particular regression. Two equations are presented for each indicator: one without controls and one controlling for GDP per capita (since poorer countries used to show more output volatility) and trade openness (since more open countries used to be more volatile). Other possible control variables did not prove to be significant.

Table 6. Ordinary Least Squares (OLS) regressions for GDP volatility

A. Dependent variable is GDP volatility in 2000-07

expected sign		A	B	C	B	E	F	G	H	I	J	K	L	M
-	BDI	-0.13	0.00											
	<i>t-ratio</i>	-1.1	0.0											
?	FIXED			0.05	-0.16									
	<i>t-ratio</i>			0.4	-1.2									
-	CBI					0.10	-0.23							
	<i>t-ratio</i>					0.3	-0.8							
-	CBT							-0.048	0.003					0.007
	<i>t-ratio</i>							-1.9	0.1					0.2
-	R&S									-0.050	-0.058			
	<i>t-ratio</i>									-0.6	-0.9			
+	CREDIT											0.0003	0.0010	0.0018
	<i>t-ratio</i>											0.2	0.5	1.3
-	GDP per Cap		-0.006		-0.009		-0.007		-0.009		-0.006		-0.009	-0.009
	<i>t-ratio</i>		-3.6		-4.3		-4.0		-2.8		-2.8		-4.4	-3.1
+	Trade open		0.004		0.005		0.004		0.000		0.003		0.004	0.000
	<i>t-ratio</i>		2.7		3.2		2.8		0.2		2.4		2.7	0.1
	R2bar	0.03	0.26	0.00	0.33	0.00	0.27	0.11	0.35	0.01	0.22	0.00	0.32	0.38
	Nobs	45	44	51	49	44	43	34	33	39	38	51	49	33

B. Dependent variable is GDP volatility in 2000-10

expected sign		A	B	C	B	E	F	G	H	I	J	K	L	M
-	BDI	-0.11	0.06											
	<i>t-ratio</i>	-1.1	0.8											
?	FIXED			0.19	0.05									
	<i>t-ratio</i>			1.5	0.4									
-	CBI					0.61	0.30							
	<i>t-ratio</i>					2.3	1.4							
-	CBT							-0.087	-0.035					-0.029
	<i>t-ratio</i>							-4.2	-1.8					-1.5
-	R&S									-0.124	-0.105			
	<i>t-ratio</i>									-1.4	-1.4			
+	CREDIT											0.0019	0.0029	0.0026
	<i>t-ratio</i>											1.9	4.3	4.4
-	GDP per Cap		-0.009		-0.009		-0.006		-0.009		-0.008		-0.010	-0.010
	<i>t-ratio</i>		-4.6		-5.0		-3.8		-3.0		-3.9		-5.7	-3.7
+	Trade open		0.004		0.004		0.003		0.002		0.004		0.003	0.001
	<i>t-ratio</i>		3.7		3.3		3.5		0.9		3.0		3.2	0.7
	R2bar	0.02	0.37	0.04	0.38	0.08	0.33	0.28	0.48	0.05	0.38	0.02	0.43	0.53
	Nobs	45	45	51	50	44	44	34	34	39	39	51	50	34

C. Dependent variable is GDP growth in 2009

expected sign		A	B	C	B	E	F	G	H	I	J	K	L	M
+	BDI	0.02	-0.96											
	<i>t-ratio</i>	0.0	-1.2											
?	FIXED			-1.13	-0.67									
	<i>t-ratio</i>			-0.9	-0.5									
+	CBI					-5.72	-4.98							
	<i>t-ratio</i>					-2.2	-1.9							
+	CBT							0.62	0.47					0.43
	<i>t-ratio</i>							2.7	2.2					2.1
+	R&S									0.867	0.771			
	<i>t-ratio</i>									1.0	0.9			
-	CREDIT											-0.019	-0.022	-0.017
	<i>t-ratio</i>											-1.9	-2.2	-2.0
+	GDP per Cap		0.048		0.021		0.011		0.023		0.041		0.028	0.030
	<i>t-ratio</i>		2.5		1.0		0.6		0.8		1.8		1.3	1.1
-	Trade open		-0.024		-0.012		-0.010		-0.012		-0.019		-0.012	-0.011
	<i>t-ratio</i>		-2.6		-1.5		-1.0		-0.6		-1.6		-1.3	-0.5
	R2bar	0.00	0.14	0.02	0.04	0.09	0.10	0.15	0.17	0.03	0.14	0.03	0.07	0.19
	Nobs	45	45	51	50	44	44	34	34	39	39	51	50	34

Notes: The dependent variable is the logarithm of the standard deviation of annual GDP growth rates between 2000 and 2010 (Panel A) and between 2000 and 2010 (Panel B); the 2009 real GDP growth rate is the dependent variable in Panel C.

BDI: Budgetary Discipline Index; FIXED: fixed exchange rate (all euro area members are classified as having a fixed exchange rate); CBI: Central bank independence; CBT: Central bank transparency; R&S: Financial regulation and supervision; CREDIT: change in credit/GDP from 2004 to 2008. Constant is also included in the regression; heteroskedasticity robust standard errors are used; the t-ratios are shown below the parameter estimates. Parameter estimates that are statistically significant (at least at the 10% level) are in bold.

Source: Authors' calculations.

Considering volatility during the pre-crisis period, practically none of the indicators are significant¹⁵. However, Section 2 above argued that considering the pre-crisis period only is misleading, because the seemingly smooth development of CESEE countries has in fact led to the build-up of various vulnerabilities. It is much more preferable to include the bust phase of the business cycle as well.

Indeed, Panels B and C do indicate that countries with better monetary institutions tended to have less GDP volatility. In particular, lower output volatility is associated with more transparent central banks and lower pre-crisis credit growth, and these results are robust to various controls (see columns H and L). Including both variables along with the controls (see column M) does not change the results much: both variables continue to be significant.

Central bank independence is significant only when other controls are not considered, though this variable is significant at the level of 11% when the 2009 growth is considered. The parameter estimate of financial regulation and supervision is correct, but this variable is not significant (columns I and J). Countries with fixed exchange rates tend to have more volatile business cycles, but the parameter estimate is not significant (columns C and D).

Central bank transparency explains about one-third of the variation in the dependent variable and, when combined with GDP per capita and trade openness, explain more than one-half of the cross-sectional variation of GDP volatility in 2000-10.

Finally, the Budgetary Discipline Index (see columns A and B) does not have a significant parameter estimate, and in some cases even the point estimate of the parameter has an incorrect sign. There might be two reasons why the premise that better fiscal institutions can dampen macroeconomic volatility did not prove true. First, not all parameters used in the construction of the Budgetary Discipline Index are important for macroeconomic stabilisation. In fact, institutions that foster stabilisation (expenditure rules or a medium-term expenditure framework) were often overwhelmed by some other features used in the index design. Thus the index is not fully adapted to testing the influence on macroeconomic volatility.

Second, the design of the Budgetary Discipline Index is tailored to CESEE countries and takes into consideration specific circumstances of the region. A number of parameters which could also be important for fostering macroeconomic stabilisation (for instance, structural balance rule and not just headline balance rule, and the existence of compensation requirements in case of overspending) are not considered in the index construction because they do not exist or are not frequent in the region. This focus on specific regional circumstances may have impaired the

¹⁵ The only exception is central bank transparency when controls are not included.

confirmation of the hypothesis, but obviously also reflects real facts (namely the absence of institutions that may be particularly relevant for stabilisation, which lends plausibility to the research result).

5.2. Fiscal outcomes

This sub-section studies the impact of the Budgetary Discipline Index on fiscal outcomes: on government debt and balance developments. As argued in Section 2.3, the study regresses the change in the debt/GDP ratio and not the level of that ratio, because current fiscal institutions do not have an impact on the inherited stock of debt which largely determines the actual level of debt¹⁶. Of course, the study controls for the initial level of debt (by including the debt level of 2000) because countries with higher debt/GDP ratios may make more efforts to reduce their debt. The study also controls for the interest rate/GDP growth rate differential because, as argued in Section 2.3, this differential had a significant impact on debt developments. These controls are included in every regression. Other control variables are also added one by one: overall institutional quality, the four measures of monetary institutions, and GDP volatility. Therefore, the regression has the following form:

$$(3) \quad \Delta\left(\frac{debt}{DDP}\right)_i = \alpha + \beta_1 BDI_i + \beta_2(i-g)_i + \beta_3\left(\frac{debt}{DDP}\right)_{2000,i} + \delta'controls_i + v_i$$

The following parameter signs would be in line with our priors: $\beta_1 < 0$ (better fiscal institutions decrease the debt/GDP ratio), $\beta_2 > 0$ (lower interest rate and faster growth reduce the debt/GDP ratio) and $\beta_3 < 0$ (higher initial debt/GDP level may induce efforts to cut decrease ratio). The expected sign of the control parameters varies. A negative parameter is expected for the overall institutional quality and monetary institutions (better institutions lead to a fall in debt), while a positive parameter is expected for GDP volatility (higher volatility makes it more difficult to reduce the debt). The key results are shown in Table 7.

¹⁶ The historical developments of fiscal institutions likely have an impact on historical debt developments. If fiscal institutions are persistent, then past fiscal institutions can impact both current fiscal institutions and current debt levels. However, even in this case current fiscal institutions likely impact the change in debt; therefore, the regression is correct in this case. Furthermore, fiscal institutions change in time, which further calls for the analysis of the change in debt and not in the level of debt.

Table 7. Regression of change in debt/GDP on Budgetary Discipline Index

expected sign	Dependent variable: change in debt/GDP from 2000 to 2007				Dependent variable: change in debt/GDP from 2000 to 2010			
	OECD + CESEE	OECD + CESEE	CESEE only	CESEE only	OECD + CESEE	OECD + CESEE	CESEE only	CESEE only
- BDI	2.0	2.4	-8.3	-12.9	9.6	10.0	-28.3	-33.2
<i>t-ratio</i>	0.2	0.3	-1.0	-1.4	0.8	0.9	-2.8	-3.5
+ Int.rate - GDP growth	2.2	2.0	2.4	2.2	2.9	2.4	3.2	2.9
<i>t-ratio</i>	5.5	4.4	6.0	4.7	2.9	1.9	5.6	4.1
- Debt/GDP in 2000	-0.2	-0.1	-0.6	-0.6	-0.1	-0.1	-0.9	-0.9
<i>t-ratio</i>	-0.9	-0.7	-5.0	-3.1	-0.5	-0.3	-4.3	-3.1
- Institutional quality		-1.2		7.2		-0.6		7.3
<i>t-ratio</i>		-0.4		1.3		-0.1		0.9
R2bar	0.41	0.30	0.83	0.79	0.30	0.22	0.78	0.73
Nobs	41	40	17	16	41	40	17	16

Notes: BDI: Budgetary Discipline Index. Constant is also included in the regression; heteroskedasticity robust standard errors are used; the t-ratios are shown below the parameter estimates. Parameter estimates that are statistically significant (at least at the 10% level) are in bold.

Source: Authors' calculations.

The Budgetary Discipline Index is not significant for the combined sample of OECD and CESEE countries, but this result is due to the inclusion of OECD countries. When the sample is restricted to CESEE countries only, the point estimate is negative as expected, and the results are highly significant when considering the 2000-10 sample. It has already been argued that the 2000-10 sample is preferable to the 2000-07 sample.

The interest rate/growth rate differential is highly significant with a proper positive coefficient in all regressions, and the initial level of debt is highly significant with a proper negative sign for the CESEE countries.

A couple of additional control variables have been included. First, we controlled for the overall institutional quality, because we have found that countries with better overall institutions tend to have better budgetary institutions as well. However, as Table 7 reveals, the BDI variable continues to be significant when controlling for the overall institutional quality, while this latter variable is not significant (and even contradictory has a positive point estimate). Second, we controlled for all four measures of monetary institutions (we have added them to the equation one by one) to see whether they have an impact on debt developments: none of the four indicators had a significant parameter estimate. Third, we also controlled for macroeconomic stability, but again, this variable turned out to be insignificant. The BDI variable retained its significantly negative estimate (for the CESEE sample) when using any of these additional control variables. Therefore, a higher BDI implies a fall in debt, and this result is robust to various controls.

The poor results of the index for the OECD countries can be explained by the existence of some outliers like Japan (highest BDI and debt) or Norway (low BDI and low debt) with country-specific circumstances. Moreover, the parameters selected for designing the index are rather tailored to the CESEE area and do not reflect a number of nuances characteristic for advanced countries. Therefore, it can impair the index results for the OECD area.

Regarding the estimates for the average budget balance, the explanatory variables are identical to the debt regressions:

$$(4) \quad \left(\frac{\text{balance}}{DDP} \right)_i = \alpha + \gamma_1 BDI_i + \gamma_2 (i - g)_i + \gamma_3 \left(\frac{\text{debt}}{DDP} \right)_{2000,i} + \delta' \text{controls}_i + v_i$$

The expected result is exactly the opposite parameter signs to the debt regressions – that is, $\gamma_1 > 0$, $\gamma_2 < 0$ and $\gamma_3 > 0$ – and the expected parameter signs of the control variables are also the opposite. The main results are shown in Table 8.

Table 8. Regression of average balance/GDP on Budgetary Discipline Index

		Dependent variable: average balance from 2000 to 2007				Dependent variable: average balance from 2000 to 2010			
expected sign		OECD + CESEE	OECD + CESEE	CESEE only	CESEE only	OECD + CESEE	OECD + CESEE	CESEE only	CESEE only
+	BDI	0.4	-0.9	4.9	5.1	0.0	-1.0	4.5	4.5
	<i>t-ratio</i>	0.3	-0.7	5.7	4.6	0.0	-0.8	5.5	4.8
-	Int.rate - GDP growth	-0.1	-0.4	-0.4	-0.5	-0.1	-0.4	-0.4	-0.5
	<i>t-ratio</i>	-1.2	-2.8	-10.9	-8.2	-1.2	-2.5	-8.7	-7.5
+	Debt/GDP in 2000	-0.03	-0.01	0.02	0.04	-0.03	-0.01	0.02	0.03
	<i>t-ratio</i>	-1.94	-0.81	1.03	1.19	-1.98	-1.00	0.82	1.04
+	Institutional quality		2.8		0.2		2.6		0.4
	<i>t-ratio</i>		3.6		0.3		3.2		0.6
	R2bar	0.11	0.48	0.77	0.78	0.10	0.46	0.66	0.68
	Nobs	41	40	17	16	41	40	17	16

Notes: BDI: Budgetary Discipline Index. Constant is also included in the regression; heteroskedasticity robust standard errors are used; the t-ratios are shown below the parameter estimates. Parameter estimates that are statistically significant (at least at the 10% level) are in bold.

Source: Authors' calculations.

In general, the results are similar to the results obtained for the debt regression, though there are important differences. The Budgetary Discipline Index is not significant for the combined sample of OECD and CESEE countries, but is significant, with a proper sign, for the CESEE sample. The results are now significant for both time periods. The interest rate/growth rate differential is significant with a proper parameter sign, but the initial debt level is not significant¹⁷.

6. Conclusions

This paper studied the role of fiscal and monetary institutions in macroeconomic stability and budgetary control. To this end, a new index of budgetary discipline was created (using available data from 2007/08) which combines rules and procedures for the three main stages of budgeting: the preparation stage (when the budget is drafted), the authorisation stage (when the budget is approved by parliament) and the implementation stage (when the budget is implemented and may

¹⁷ Considering the other controls: overall institutional quality is significant (with a proper positive parameter) for the OECD countries, but not for the CESEE countries; the four monetary institutional variables have properly signed parameter estimates, but are generally not significant (the most significant variable is central bank independence, which is significant at a 10 percent level). When considering the CESEE sample, the Budgetary Discipline Index remained highly significant when adding any of these control variables, and therefore these regressions also underline that better fiscal institutions lead to better fiscal outcomes.

be amended). For monetary institutions, four indicators were studied: the type of exchange rate regime, an index of central bank independence, an index of central bank transparency, and an index of financial regulation and supervision. Since the latter suffers from deficiencies, the pre-crisis speed of credit growth has been used as a proxy for proper financial regulation and supervision.

This paper studied the impact of these indicators on macroeconomic stability and budgetary control. It has been noted that CESEE countries tend to grow faster (or at least tended to grow faster before the crisis) and have more volatile growth than non-CESEE OECD countries. This phenomenon has implications for macroeconomic management. More volatile output developments lead to more volatile budget revenues, and expenditures (both through automatic stabilisers and possibly through discretionary stimulus) are also expected to be more volatile. In the absence of sound fiscal institutions, this could lead to pro-cyclical fiscal policy. Indeed, using structural vector-autoregressions, Darvas (2010) found that fiscal policy was pro-cyclical in most CESEE countries (with a few exceptions). This calls for strong fiscal institutions. Yet the Budgetary Discipline Index suggests that fiscal institutions are considerably weaker in several CESEE countries than in non-CESEE OECD countries. Therefore, there is significant room for improvement in most countries.

The recent global financial and economic crisis hit CESEE countries harder than other emerging country regions of the world. Recovery from the crisis is also slower. These developments raise question marks about the pre-crisis development model of the region, which was largely based on institutional, financial and trade integration with the EU and was accompanied by substantial labour mobility. Recent research suggests that the good features of this model should be preserved, but several CESEE countries have to implement significant changes to this economic model in a much less benign domestic and international environment. Economic growth will likely fall substantially behind pre-crisis economic growth trends.

It has been shown that the general decline in government debt/GDP ratios of most CESEE countries before the crisis was the consequence of a highly favourable relationship between economic growth and the interest rate: economic growth well exceeded the interest rate. Therefore, government debt/GDP ratios fell in CESEE countries but not in non-CESEE OECD countries, even though the budget balance was better in the non-CESEE OECD group. Since growth will likely slow down and interest rates will rise after the crisis, a less favourable relationship is expected between the growth rate and the interest rate which also calls for enhanced budgetary frameworks.

By comparing the budgetary discipline indices of CESEE countries with the indices of OECD countries, the latter appear to be generally higher, and the average index among OECD countries is significantly higher than the average index in CESEE countries. However, there is a relatively large heterogeneity among OECD countries as well.

The final part of the paper used econometric models for studying the impact of fiscal and monetary institutions on macroeconomic stability and fiscal outcomes. Some evidence was found that better monetary institutions dampen macroeconomic volatility. But the hypothesis that better fiscal institutions promote macroeconomic stability could not be confirmed. This result can possibly be explained by the fact that various parameters which are important for macroeconomic stability have only weak impact on the index values. Moreover, the index is specifically tailored to the CESEE region and therefore omits some important characteristics which are frequent in advanced countries but do not exist in CESEE countries. When controlling for the difference between interest rate and growth rate and initial level of debt, the Budgetary Discipline Index significantly explains debt and balance developments in CESEE countries: countries with a higher index had a smaller increase in the

debt/GDP ratio and better budget balances. This result was robust to the inclusion of several control variables, including an indicator of overall institutional quality. All of these results call for better budgetary procedures and improved monetary frameworks.

References

- Anderson, B. and J.J. Minarik (2006) "Design Choices for Fiscal Policy Rules", *OECD Journal on Budgeting* 5(4):159-208.
- Badinger, Harald (2009) "Fiscal rules, discretionary fiscal policy, and macroeconomic stability: an empirical assessment for OECD countries", *Applied Economics* 41(7):829-847.
- Barth, James R., Gerard Caprio Jr. and Ross Levine (2008) "Bank Regulations are Changing: For Better or Worse?", *Comparative Economic Studies* 50: 537–563.
- Becker, Torbjörn, Daniel Daianu, Zsolt Darvas, Vladimir Gligorov, Michael A. Landesmann, Pavle Petrovic, Jean Pisani-Ferry, Dariusz K. Rosati, André Sapir and Beatrice Weder Di Mauro (2010) "Whither Growth in Central and Eastern Europe? Policy lessons for an integrated Europe", 24 November, Bruegel and The Vienna Institute for International Economic Studies (WIIW), Brussels, www.bruegel.org/publications/publication-detail/publication/453-whither-growth-in-central-and-eastern-europe-policy-lessons-for-an-integrated-europe/.
- Berglöf, Erik, Yevgeniya Korniyenko, Alexander Plekhanov and Jeromin Zettelmeyer (2009) "Understanding the crisis in emerging Europe", *EBRD Working Paper* No. 109.
- Crowe, Christopher and Ellen E. Meade (2007) "Evolution of Central Bank Governance around the World", *Journal of Economic Perspectives* 21(4):69-90.
- Cukierman, Alex, Steven B. Webb and Bilin Neyapti (1992) "Measuring the Independence of Central Banks and Its Effect on Policy Outcomes", *The World Bank Economic Review*, September, 6(3):353-398.
- Darvas, Zsolt (2010) "The Impact of the Crisis on Budget Policy in Central and Eastern Europe", *OECD Journal on Budgeting* 10(1):45-86. <http://ideas.repec.org/a/oec/govkaa/5km7s5m3nlvd.html>
- Darvas, Zsolt and György Szapáry (2008) "Euro area enlargement and euro adoption strategies", *European Economy – Economic Papers* No. 304, DG ECFIN, European Commission, Brussels. <http://ideas.repec.org/p/euf/ecopap/0304.html>
- Debrun, Xavier, David Hauner and Manmohan S. Kumar (2009) "Independent Fiscal Agencies", *Journal of Economic Surveys* 23(1):44-81.
- Dincer, Nergiz and Barry Eichengreen (2007) "Central Bank Transparency: Where, Why and With What Effects?", *NBER Working Paper* No. 13003, National Bureau of Economic Research, Cambridge, Massachusetts, United States.
- Dincer, Nergiz and Barry Eichengreen (2009) "Central Bank Transparency: Causes, Consequences and Updates", www.econ.berkeley.edu/feichengr/central_bank_transp_feb09.pdf
- EBRD (European Bank for Reconstruction and Development), Main macroeconomic indicators database, www.ebrd.com

- Fabrizio, Stefania and Ashoka Mody (2008) "Breaking the impediments to budgetary reforms: evidence from Europe", *IMF Working Paper* No. 08/82, International Monetary Fund, Washington DC.
- Fatás, Antonio and Ilian Mihov (2003) "The Case for Restricting Fiscal Policy Discretion", *The Quarterly Journal of Economics* 118(4):1419-1447.
- Geraats, Petra M. (2006) "Transparency of Monetary Policy: Theory and Practice", *CEPR Economic Studies* 52:111-152.
- Geraats, Petra M. (2008) "ECB Credibility and Transparency", *European Economy – Economic Papers* 330, Directorate General Economic and Monetary Affairs, European Commission, Brussels.
- Geraats, Petra M. (2009) "Trends in Monetary Policy Transparency", *CEPR Working Paper Series* No. 2584.
- Ghosh, Swati (2009) "Credit Crunch or Weak Demand for Credit?" in The World Bank, *EU10 Regular Economic Report*, October, 37-44.
- Hallerberg, Mark, Rolf Strauch and Jurgen von Hagen (2007) "The design of fiscal rules and forms of governance in European Union countries", *European Journal of Political Economy* 23(2), 338-359.
- Hilbers, P., I. Otter-Robe, C. Pazarbasioglu and G. Johnsen (2005) "Assessing and Managing Rapid Credit Growth and the role of Supervisory and Prudential Policies", *IMF Working Paper* WP/05/151, International Monetary Fund, Washington DC.
- IMF (2008) *Regional Economic Outlook Europe*, International Monetary Fund, Washington DC, April.
- IMF (2009) *Fiscal Rules Anchoring Expectations for Sustainable Public Finances*, International Monetary Fund, Washington DC.
- IMF (2010) *World Economic Outlook*, April, International Monetary Fund, Washington DC.
- Kopits, G. and S. Symansky (1998) "Fiscal Policy Rules", *IMF Occasional Paper* No. 162, International Monetary Fund, Washington DC.
- Kraan, Dirk-Jan (2007) "Programme Budgeting in OECD Countries", *OECD Journal on Budgeting* 7(4).
- Kraan, Dirk-Jan, Daniel Bergvall, Ian Hawkesworth and Philipp Krause (2006) "Budgeting in Hungary", *OECD Journal on Budgeting* 6(3).
- Kydland, Finn and Edward Prescott (1977) "Rules Rather than Discretion: The Inconsistency of Optimal Plans", *Journal of Political Economy*, June, 85(3):473-490.
- Mitra, Pradeep, Marcelo Selowsky and Juan Zalduendo (2009) "Turmoil at Twenty: Recession, Recovery, and Reform in Central and Eastern Europe and the Former Soviet Union", The World Bank, Washington DC, November.

Rogoff, Kenneth (1985) "The Optimal Degree of Commitment to an Intermediate Monetary Target", *The Quarterly Journal of Economics*, November, 100(4):1169-1189.

Szapáry, György (2009) 'Regional Perspectives: Euro Area Neighboring Countries', in Jean Pisani-Ferry and Adam S. Posen (eds), *The Euro at Ten: The Next Global Currency?*, Peterson Institute for International Economics and Bruegel, pp. 121-138

Walsh, Carl (1995) "Optimal Contracts for Central Bankers", *American Economic Review*, March, 85(1):150-167.