Contents

An Overview

This work is composed of three autonomous papers each of them is focused on the role of institutions in affecting economic performance of a State. From this point of view the common denominator is the attempt to give an answer to the following question: "do institutions matter?"

In the first paper we give a brief review of the main literature and topics about rules and public budget procedures. From a general point of view, fiscal rules may play an important role in reducing deficits and may help to control the growth of government debt.

There are two classes of fiscal rules: quantitative constraints on fiscal policy and rules on the procedures by which fiscal decisions are made. Quantitative constraints take a variety of forms such as restrictions on deficit financing (for example balanced budget laws), expenditure ceilings, numerical targets for relevant fiscal variables, borrowing rules and restrictions on issue of debt.

Procedural rules concern the extent to which the process of formulating the budget is "hierarchical"; rules of amendment in both the formulation and approval of the budget; the structure of voting in the approval process; and the effective requirements for "transparency"in the budget documents.

Above all, the paper is focused about some principles leading the choice between different budget institutions and procedures. From these topics we draw out an important and informal stage of budget procedures given by the interaction between Ministry of economics and Spending ministries.

In the second paper we model a such interaction in the way of a "common pool problem", giving an argument about the question if "institutions matter". In common pool models fiscal outcomes are determined by the decision making rule that is used to aggregate conflicting interests into a single budget. This paper analyses a model in which the minister of finance internalizes the common pool externality of the budget. From an institutional point of view, this assumption is realistic because he takes into account the budget equilibrium. The common pool problem arises, from the fact that each spending minister takes into account only a share of the excess burden, i.e. the portion that falls on his constituency.

There are two ways of reducing the spending and deficit bias arising from the coordination problem in the budget process: either delegation of authority to the finance minister or commitment by the whole government to a set of binding limits on expenditure allocations collectively negotiated at the beginning of

the budgeting process. In the first case, the larger is the finance minister's agenda-setting power, the closer the deficit comes to the collectively optimal outcome. With our model we demonstrate that delegation power to a strong Ministry of Economics has an impact in terms of reducing deficit bias.

In the third paper we give an empirical exercise about the role of institutions on economic performance of a State. In this chapter we test the Wagner's assumption pointing out the one-sided direction that goes from economic growth (GDP) to the total government spending (TGS) for Italy in the period 1951-2009. The analysis considers some structural breaks related to changes in the Italian budget rules and procedures.

The application of the ADF test suggests that the Ciampi's reform occurred in the year 1997 is relevant for our analysis in order to guarantee the cointegration between variables. A VECM is carried out in order to capture how variables react to a positive shock of another ones. Generally, the results suggest that Wagner's law seems to be empirically satisfied, i.e. public spending positively reacts to a positive shock in economic activity. Comparing the results of the Wagner's law in pre and post-reform, we can see that government spending positively reacts to economic shocks in both cases, although there is a decreasing trend when pre-reform period is taken into account.

Chapter 1

Budgeting institutions in the theoretical economic literature

1.1   Introduction

From a general point of view, fiscal rules may play an important role in reducing deficits and may to help control the growth of government debt. There are two classes of fiscal rules:

a) Quantitative constraints on fiscal policy

b) Rules on the procedures by which fiscal decisions are made

About quantitative constraints, much of the discussion of fiscal rules concerns such restrictions. These take a variety of forms such as restrictions on deficit financing (for example balanced budget laws), expenditure ceilings, numerical targets for relevant fiscal variables and borrowing rules. Procedural rules concern the extent to which the process of formulating the budget is "hierarchical"; rules of amendments in both the formulation and approval of the budget; the structure of voting in the approval process; and the requirements for "transparency" in the budget documents.

1.2   The political economy of budget deficits. Time inconsistency

From a general perspective we argue some issues on why rules, fiscal or otherwise, may be optimal. Basic economic theory suggests that welfare will be higher when a policymaker who wants to maximize social welfare is free to choose policy without arbitrary constraints, that is to use his discretion. A standard argument for rules over discretion for a social-welfare-maximizing policymaker concerns cases where, first,

individual behavior depends on expectations of future policy and, second, where the policymaker is limited in his choice of policy instruments. If he can choose policies over time, he will often have the incentive to announce one policy for the future and then implement a different policy when time come to carry out his policy announcement. This is the well-known case of time-inconsistency in the choice of policy (see Drazen, 2000). Moreover, the policymaker has the incentive to be time inconsistent in the choice of policies because his objective is to maximize social welfare.

When individuals know the incentives of policymakers to be time inconsistent, time inconsistent policy is not an equilibrium. People will form their expectations of future policy on the basis of the known incentive of the government to deviate from announcements.

The cost of discretion is that the equilibrium that results may imply low welfare, lower than case in which the government could credibly commit itself ex ante to a specific policy. If rules can be made credible in the sense that government is expected to follow them, "rules"give higher welfare than discretion.

The literature on time inconsistency provides many examples. The best known macroeconomic example is probably the "inflation bias"result of Barro and Gordon (1983). In their example, the government maximizes the welfare of the representative individual, whose utility depends on fluctuations of unemployment and on inflation around their target values. Surprise inflation will lower actual unemployment relative to the natural rate of unemployment, where the representative individuals (and hence the government's) target unemployment rate is below the natural rate. Suppose that the target inflation rate is zero. If people expected a zero inflation rate (let's due to a government announcement), the government would have the incentive to choose an inflation rate above zero in order to lower unemployment below the natural rate.

This incentive to inflate will be anticipated so that a zero inflation announcement would not believed. Equilibrium is one where a positive rate of inflation is correctly anticipated, so that unemployment is at the natural rate, but inflation is sub-optimally high.

The problem is that if the government can, it will use its discretionally policymaking power to try to lower unemployment. This attempt will be unsuccessful in equilibrium, but will have adverse inflation implications. If the government had a mechanism to credibly commit itself to choose of zero inflation, welfare would be higher. Hence, we have an illustration of the argument for a (credible) rule over discretion.

Two points should be stressed about the basic time inconsistency result on inflation. First, rules work constraining the policymaker even if he is a social welfare maximizer. Second, the argument for rules revolves not only around the unpredictability of inflation policy, but around its known positive bias. Credible rules may also improve welfare by lowering the unpredictability of policy, but this is not the main result. In the case of fiscal policy, we begin from a similar perspective. Credible rules may make fiscal policy more predictable, but the main argument for fiscal policy rules is related to the bias toward positive government budget deficits observed in many countries. The attraction of rules is that, by constraining policymakers,

they will reduce or eliminate the tendency towards budget deficits.

1.3 The political economy of budget deficits. The political process

In addition to any time inconsistency reasons, other arguments regarding the inherent bias toward fiscal deficits in many countries are focused on the political process of budgeting. The term "political process"refers not simply to the legislative budgetary process, that is the rules and institutions by which the budget is made. It refers to the process of making and implementing the budget combined with the political forces that determine the nature of the budget that emerges from that political process.

There are two questions: a) what are these political forces such that this bias tends to be towards excessive deficit b) what is the nature of the legislative budget process that allows political forces to bias the budget outcome relative to what is considered socially optimal. The second point will be discussed below in the second part of this work.

When discussing the political economy of fiscal policy, it is natural to ask what benchmark for government behavior should be adopted. The neoclassical theory of fiscal policy (see Barro, 1979, 1989; Lucas - Stokey, 1983); Lucas, 1986) stresses the importance of achieving tax smoothing. Budget deficits should be used to cover temporary increases in government spending while tax rates should be kept constant to minimize distorsions. Keynesian models of aggregate demand management stresses the importance of fiscal policy as a stabilizer: fiscal policy should be expansionary during recessions and contractionary during expansions in order to moderate business cycle fluctuations.

The political economy literature provides possible explanations as to why governments may systematically deviate from these principles of fiscal policy. A general feature of these models is that institutional set-up is taken as given; they focus on how economic and political factors interact given an institutional environment in shaping fiscal policy.

Summarizing we can identify (according with Alesina-Perotti 1995) four models of political economy of fiscal policy.

1) First, there is the electoral motive towards high spending in election years. In many countries incumbents appear to increase government spending before elections in order to improve their re-election prospects: the key assumptions are that policymakers are opportunistic. Voters fail to understand the intertemporal budget constraint of the government, they overestimate the benefit of current expenditures and underestimate future tax burden, so that do not "punish"politicians for fiscally irresponsible behavior. (Wagner 1976, Buchanan Wagner 1977)

2) A second political process argument concerns bureaucratic behavior. Niskanen (1971) argues that

the behavior of bureaucrats may be explained by budget maximization. They try to maximize their budgets since a higher budget translates into both higher salaries and more power.

3) The third strand of literature emphasizes that the stock of debt has an effect on the policy choices of future governments, and can therefore be used to constrain its actions (Alesina-Tabellini, 1990). In this context, a deficit bias can arise because of a conflict about spending priorities between different political parties. This conflict, together with electoral uncertainty, implies that the current Government does not fully internalize the cost of running budget deficits today. The deficit bias is increasing in the degree of political polarization and in the degree of electoral uncertainty.

4) Models of distributional conflict (Alesina - Drazen, 1991) emphasize how conflict between different social groups (represented by parties, interest groups, coalition members) can delay the adoption of necessary measures to stem an increase in public indebtedness caused by some exogenous factor. The reason for the delay is that the groups cannot agree on burden-sharing for the necessary fiscal adjustment. These models predict that fragmented or divided Governments and polarized societies have more difficulty in implementing fiscal adjustment measures than single-party Governments and less polarized societies. Evidence presented in Roubini - Sachs (1989) and Grilli - Masciandaro - Tabellini (1991) for OECD countries, and by Poterba (1994) and Alt - Lowry (1994) for US states is consistent with this predictions.

1.4   The budget process

The approach that examines budget institutions differs from the previously examined ones because it looks inside the black box from which budgetary outcomes emerge. There is a sense in which the literature on budget deficits and budget institutions is complementary to the literature on the political economy of budget deficits as previously seen. Namely, while the latter takes institutions as given and studies the impact of political and distributive factors on budget outcomes, the former takes political incentives as given and examines the link between different budget institutions and budgetary outcomes.

One can identify three phases in the budget process:

1) the formulation of a budget proposal within the executive

2) the presentation and approval of the budget in the legislature

3) the implementation of the budget by the bureaucracy

The budget process can be characterized as a system of formal and informal rules and regulations shaping the decision-making process that leads to the formulation of the budget by executive, its passage

through the legislature and its implementation[1].

It is important to take all three stages into account, and in particular the set of incentives and constraints which the different "actors"(Government, Legislature, Bureaucracy) are subjected at each stage. Before of all two issues are crucial: the voting procedures leading to the formulation and approval of the budget, and the degree of transparency of the budget. Voting procedures are clearly important because they establish who has an influence on the final budget outcome, and when. The transparency is equally important since "creative accounting"can circumvent even the most stringent voting procedures. In fact, the two issues are strictly connected: voting procedures have an impact on the final outcome if the latter can be monitored because it is transparent. In this sense hierarchical institutions have the property that the limit the democratic accountability of the process. Collegial institutions have the opposite features.

Hierarchical institutions are those that, for instance, attribute strong prerogatives to the prime minister (or the Minister of economics and finance) to overrule spending ministers within intra-governmental negotiations on the formulation of the budget. Hierarchical institutions also limit in a variety of ways the capacity of the legislature to amend the budget proposed by the government. Collegial institutions emphasize the democratic rule in every stage, like the prerogative of spending ministers within the government, the prerogatives of the legislature and the rights of the minority opposition in the legislature. Hierarchical institutions are more likely to enforce fiscal restraint, avoid large and persistent deficits, and implement fiscal adjustments more promptly. On the other hand, they are less respectful of the rights of the minority, and more likely to generate budgets in favor of the interests of the majority. Collegial institutions have the opposite features.

1.5   The formulation of the budget

This stage consists of the drafting of the Budget Law by the Government. The formulation of the budget is divided into different sub-stages: the setting of budget targets and guidelines, the presentation of budget bids, the compilation of the budget drafts, its reconciliation and finalization. The participants in this phase include the Prime Minister, the Finance Minister(s) and the "spending Ministers". It seems reasonable to assume that spending ministers have an incentive to seek the control of a sufficiently large amount of resources, either to increase personal prestige, or to seek a more important role for their ministry. Given the tax revenues are typically not "earmarked"for specific expenditures, these ministers may fail to internalize fully the cost of the (present or future) taxation necessary to cover their expenditures. By contrast, the Prime Minister and the Finance Minister are more likely to internalize the costs of additional spending, and

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[1]A fourth stage of the budget process, ex post control, is beyond the scope of this work (see Tanzi, 1994 for a discussion with reference to Italian case)

Fig 1 Structure of government stage

STEPS	TYPE OF PROCEDURE			
	Strategically centralized	Decentralized guided	Decentralized	
Budget targets and guideline	Prime Minister (PM) or Finance Minister (MF)	Cabinet on proposal by MF	Cabinet	
Budget bids	Spending ministries	Spending ministries	Spending ministries	
Compilation of draft	MF in bilateral negotiations	MF as intermediary betwee spending ministers and cabinet	MF, simply collecting bids	**D E C I S I O N M A K E R**
Reconciliation	PM or Senior Cabinet Committee	Senior Cabinet Committee or Cabinet	Cabinet	
Finalization	Cabinet	Cabinet	Cabinet	

are therefore more likely to be "fiscal conservative". The key issue is how procedures in the preparation of the Budget Law shape the strategic interaction between these agents.

A fundamental feature of this stage is the degree of centralization in the formulation of the budget draft. Greater centralization implies that the Finance Minister has more dominant role in the formation of the budget law. By contrast, in a more decentralized process collegial mechanism typically guide budgetary decisions. Fig.1, reproduced from von Hagen - Harden (1994), summarizes the key steps in the government stage, distinguishing between three different degrees of centralization of the process. According to these authors, within the European Union, France and the UK are the clearest examples of budget centralization, while Greek, Irish and Belgian systems are the most decentralized. Italy has an intermediate degree of centralization. The nature of the distortion - failure by spending ministers to appropriately internalize the

cost of their expenditure - clarifies why decentralized procedure are more likely to lead to a deficit bias.

What structure of budgetary procedures would reduce the bias towards excess spending at this stage? There two possible answers. One is to have the overall size of the budget determined in advance by some commitment mechanism, such as a numerical target. This target could be formally enshrined in the Law, for example in the form of a balanced budget amendment or constitutional limits on the size of the budget deficits. In this case, the bargaining within the Cabinet would take place in the presence of overall ceiling on available resources, thus containing free riding behavior. The second is to give more power to Finance Minister vis-à-vis the spending ministers in the bargaining process. For example, the Finance Minister could direct the budget procedure and have a veto power on spending decisions, or the ability to adjust spending proposal. Also, conducting bilateral negotiations with spending ministers, rather than full cabinet negotiations, may reduce the scope for "reciprocity" - that is, favoring each other's spending programs (von Hagen, 1992). The second paper of our work is focused on this topics.

1.6 The Parliamentary Stage

This phase consists of the passage through Parliament of the Budget Law, up to its final approval. There are two crucial aspects of this phase. The first is the scope of the amendments: for example, whether these amendments can increase spending and/or reduce revenues. The second, more general, aspect is the strategic relation between the Government and Parliament, which is linked to the voting procedures on the budget.

Why are these factors important? What are the incentives for "profligate"fiscal behaviour within Parliament? Like spending ministers, members of Parliament may propose amendments that benefit their constituencies, failing to internalize the fiscal cost associated with these measures. These incentives may be partially mitigated by party discipline, although this factor is likely to play a modest role in politically fragmented systems. Budgetary procedures designed to lead to more responsible fiscal behaviour may therefore limit the scope of amendments that change the overall budget balance or that increase expenditures and/or reduce revenues. With regard to the strategic interaction between the Government and Parliament, the key issue concerns the political implications of an outright rejection of the budget. Two strategic elements can be at play (Von Hagen - Harden, 1994). On the one side, the Government may be pushed to adopt proposals that likely to receive broad support in Parliament. If the same deficit bias exists at Parliamentary level, this will tend to weaken the overall budget stance. On the other side, however, members of Parliament belonging to the governing party(ies) will be more unlikely to vote against specific budget proposals, or to propose amendments that would lead to the defeat of the budget. This strengthens the position of the Government. Von Hagen and Harden argue that the second element is likely to prevail on the first, implying that

Fig. 2 Structure of Parliamentary stage

	TYPE OF PROCEDURE		
	Restrictive	Intermediate	Open
Scope of amendments	Amendments cannot increase spending or reduce revenues, or certain amendments are not receivable	Cabinet on amendments cannot change overall balance	No limits on amendments
Relation of Upper and Lower House	Upper House has no budgetary powers	Lower House has prerogative over Upper House	Lower and Upper House have equal right
Relation of Government and Parliament	Government can call vote of confidence, can impose voting procedure on Parliament; amendments require consent	Amendments can cause fall of Government	No special stipulations

a vote on confidence on the budget strengthens the relative bargaining position of the Government vis-à-vis Parliament, thus facilitating the adoption of "sound"budget policies.

Fig.2 illustrates the different steps in the parliamentary stage of the budget process, and identifies three different types of procedures, classified from restrictive to open. Among countries of the European Union, France and UK have a system which is particularly restrictive with regard to the scope of amendments that can be proposed. In contrast, Belgian system has no limit on amendments, and amendments can force the Government's resignation only under very special circumstances.

With regard to Italy, it should be noted that the number of amendments proposed can be staggering, thus imposing de facto constraints on the Government at the budget preparation stage. Even though Parliament may not have directly adopted amendments worsening the overall fiscal balance, the need for compromise may have pushed the Government to draft "weak"budgets in order to pre-empt parliamentary opposition - particularly when the Government's support in Parliament was weak and fragmented. In part because of the complexity of the interaction between Government and Parliament, there remains disagreement on whether Parliament has played an important role in shaping fiscal policy decisions in Italy.

1.7 The implementation stage

This stage refers to the execution of the Budget Law. There are two aspects of particular importance: how binding the Budget Law is, and how much flexibility there is to face unforeseen contingencies. Examples of the first are the power of the Finance Minister to restrain spending beyond the budget amounts, and the control of open-ended expenditure such unemployment compensation and pensions. The degree of flexibility is related to the possibility of introducing supplementary budgets during the fiscal year, the ability to transfer resources between budget chapters, the existence of a budget reserve, and the possibility of setting aside unused funds for future expenditures (carry-over). According to these criteria, Italy's Budget Law is only weakly binding and the budget implementation system is inordinately flexible.

A binding Budget Law clearly constitutes a commitment to budget discipline, because it imposes a hard budget constraint on spending centers. In this regard, practices that enhance budget flexibility, such as the ability to transfer resources between chapters or to carry over unspent funds to the next budget year, weaken budget constraints and hinder budget transparency by creating wedges between ex ante appropriations and ex post outcomes. Finally, the possibility of introducing substantive budget revisions, such a supplementary budget, can also weaken fiscal discipline at the implementation stage. More importantly, this possibility also alters incentive at previous stage of the budget process, because it reduces the degree of commitment implicit in budget decisions. In practice, however, there can be discrepancies between ex ante budget targets and ex post outcomes because of open-ended expenditures or because of the effects of the cycle on tax revenues. In the presence of a rigid numerical target, it is important to consider what, if any, are the ex post mechanism designed to ensure its achievement - for example, automatic spending cuts and/or tax increases. Fig 3., exemplifies three different types of procedures at the implementation stage, classified according to their degree of restrictiveness.

1.8 Voting procedures and amending rules

The voting procedures lead to the formulation and approval of the budget, and the degree of transparency of the budget. Voting procedures are clearly important because they establish who has an influence on the final budget outcome. The transparency is equally important since "creative accounting"can circumvent even the most stringent voting procedures. The two issues are strictly connected because voting procedures have an impact on the final outcome if the latter can be monitored because it is transparent.

A vast literature in formal political science has studied how different voting procedures in legislature lead to different outcomes. A good portion of this research focuses on the budget and, in particular, is based upon a view of the budget as the result of conflicting interests of representatives with geographically based constituencies. Weingast, Shepsle and Johnsen (1981) argue that representatives with geographically

Fig.3   Structure of Implementation Stage

	TYPE OF PROCEDURE		
	Restrictive	Intermediate	Open
Expenditure Management	Disbursement approval required, spending departments subject to cash limits, MF can block expenditures	Disbursement approval required, and/or spending departments subject to cash limits	Disbursement approval required or full or full authority of spending departments
Transfer of appropriations	Within chapters only	Within chapters unrestricted, between chapters upon approval by MF	Unrestricted
Substantive revisions	By new law and rarely used	By new law, commonly used	By approval of MF

based constituencies ask for spending programs that benefit their district and are financed nationwide. Thus, representatives systematically do not internalize the "true"costs of financing such projects. The idea is that the voters of the ith district receive benefits for a certain public project in their district, but have to pay 1/N of the total costs of financing such projects, if N is the number of districts and if taxes are equally distributed among districts. A geographically elected representative does not fully internalize the effect of spending in his district on the tax burden of the country. The aggregate effect of rational representatives facing these incentives is an excessive demand of public goods with geographically targeted benefits and diffuse financing costs.

Baron (1989, 1991) and Baron and Ferejohn (1989) study the question of how legislatures reach agreement on how to choose pork barrel projects . They study both how the legislature choose the allocation of benefits of a certain budget among legislators representing different districts and how the legislature choose among different budget, more or less efficiently. This line of research emphasizes a distinction between closed rules and open rules in amendments.

A closed rule is one in which a proposal made by a member of the legislature has to be voted immediately up or down. If it is approved, the "game is over"; if it is rejected, a new member of the legislature can make another proposal, which again is voted up or down.

An open rule, instead, is one in which the proposal made by the member selected is subjected to amendments. A proposal implies a budget allocation of benefits between districts. Closed rules and open rules crucially differ in that the first procedure gives greater power to the first agenda-setter. He offers sufficient benefits to the majority to avoid the proposal by the next agenda setter if the first proposal is rejecte. Every legislator knows that a vote against the first proposal could open to a worse following proposal by the next agenda setter. So the acceptance threshold is relatively low also in the case of proposal with higher benefits for the first agenda setter's district.

Open rules imply a lower power for the first agenda setter. If he offers general benefits for every district the proposal is approved without amendments but the benefit for the agenda setter's district is lower. On the other hand with lower general benefits grater is the probability of amendment by a legislator and new coalition majority around it.

In actual legislatures the agenda setter in the budget process is the government. Thus, closed rules attribute more power to the government and less to the parliament. The result is that closed rules are more hierarchical. It implies that in the case of closed rules budgets are approved rapidly and reflect more closely the preference of the government. With closed rules it's impossible for the legislature to amend the size of the deficit. If the legislature wants to increase spending, it also has to increase taxes.. Even more stringent procedures make it impossible for the legislature to increase not only the deficit, but even total spending. In this case the legislature can only change the allocation of spending and revenues but not their

total. The discussion about possible amendments of the legislature highlights several aspects of trade-off between hierarchical and collegial procedures. Closed rule imply quick approval of a proposal, at the cost of implementing "unfair"budgets. Budget are unfair in the sense that they are tilted in favor of those who make the first proposal and always distribute benefits to the smallest possible majority.

1.9 The role of fiscal rules

The key question about fiscal rules is whether they have the effect of slowing the growth of deficits. Many argue that fiscal rules are not only likely to be less effective, but also generate incentives for creative accounting and, more generally, for a reduction in the transparency of the budget process. A related question is whether such rules are necessary if a government is committed to fiscal restraint. In this case the reputation of a government as fiscal conservative take the place of such rules. Governments truly committed to fiscal discipline build a reputation for a balanced budget policy and hence make credible their announcement to that effect, while governments that are not committed to fiscal discipline and that have no intention of following fiscal rules find ways to get around them. Therefore commitment could be stronger than rules as the latter invite "creative fiscal accounting". Rules, rather than substituting for reputation, may help a government to build its reputation. In general, legislated rules have an effect and make policy more credible relative to simply an announced commitment

1.10 Policy rules vs procedural rules

There a number of papers that argue that the focus on fiscal rules should shift away from numerical policy rules toward more focus on institutions and the budget process (see, for example, von Hagen 1992, von Hagen and Harden 1994, Alesina and Perotti 1996). A first principle (see Kopits) is that a fiscal rule is more likely to be effective the more it is designed to address the specific cause of the problem. This is a key argument in favour of procedural instead of numerical policy rules. To the extent that one can pinpoint what aspect of the budget procedure may be responsible for the bias towards deficits, procedural rules should be tightened with respect to this aspect. Of course, being able to pinpoint the exact cause of the problem is far easier said than done. In this respect, numerical policy rules seem like a "blunt instrument"used in absence of more precise ones. There is a difficult trade-off in the design of a numerical policy rule. Too simple or rigid a rule (that is with no state contingencies or escape clauses) lacks the flexibility that may be necessary in the face of economic developments. Hence, over long term, it will be impossible to satisfy and hence is not credible (unless of course, "creative accounting"is used to satisfy it, also reducing its credibility). It will not obeyed or will be changed. However, allowing too much flexibility also reduces the credibility of the

commitment to fiscal discipline itself. Though state-contingent quantitative rules are generally preferable from a theoretical point of view, they are not always workable. First of all, it is impossible to specify all possible contingencies ex ante. Second, it is often difficult to verify if the government has reneged on a state-contingent rule or not. The difficult of verifying whether the government has abided by a numerical fiscal restriction in itself suggests that to be credible, numerical fiscal policy rule must to be simple, though we come back to the problem listed earlier (Kopits and Pedone).

The requirement that compliance with a fiscal rule be easily verifiable is usually labelled transparency of fiscal rules. Transparency is generally thought to be central for quantitative fiscal restrictions to be effective in controlling the growth of deficits. Among the methods used to circumvent the effectiveness of balanced budget rules are: over optimistic predictions of key macroeconomic variables; strategic use of what is kept on or off budget; measuring fiscal adjustment relative to an inflated baseline. Quantitative restrictions may increase the incentives for "creative account" and hence could actually lead to worse outcomes in terms of welfare. Another aspect of transparency is the difficult of measuring fiscal variables, much more so than for inflation. Not only there is disagreement about which measure of the deficit is the "correct"one, but also even when there is agreement about which measure to use, the easy with which deficit measure may be manipulated makes verification especially difficult.

Von Hagen ([64]) and other suggests that numerical policy rules can play a positive role if they are adopted in a framework for reform of the budget process that addresses procedural problems, especially in the budget formulation stage. Otherwise, they argue, such rules are not only likely to be ineffective, but also create incentives for creative accounting and reduce the transparency of the budget process. This suggests that rather than rely on numerical targets, one may want to concentrate on procedural rules that modify the structure of the budget process so that it is more difficult for actors in the process to adopt fiscally irresponsible behavior. These authors suggest that specific reforms would include strengthening the position of the finance minister, limiting the scope for amendments to the budget at the parliamentary level, and enforcement of hard budget constraints at the implementation stage. One may add that the adoption of numerical fiscal rules may counterproductive in that they divert attention from the need to change the fiscal policymaking process itself.

1.11 Reputation and fiscal rules

To examine the relation between reputation for fiscal discipline and fiscal rules we need a brief review of reputation under incomplete information. Generally speaking, the argument that observing an increase in government spending reduces our belief in the government's commitment to fiscal discipline is a story about unobserved characteristics. It is assumed that there is incomplete information about each player's

"type", with different types expected to play in different ways. We then make an inference about what is unobserved (the type) on the basis of observed past actions, so that the expectation of future behaviour is based on what has been observed in the past. "Reputation"in summarized by the public's belief about the government's type, where reputation depends on observed past actions. We could thus think of two types of policymakers - committed and less committed to fiscal discipline. If commitment is unobserved, the public uses observations of government spending and deficits to form inference on type. It is in this sense that is often argued that actions showing a commitment to fiscal discipline may substitute for fiscal rules in making credible the commitment to fiscal reduction. There are, however, a number of ways in which this basic argument must be amended.

First, in applying the notion of reputation under asymmetric information to fiscal policymaking, the key observation is that there is not a policymaker, but a political process that generates outcomes. Hence, observing fiscal outcomes gives information on the nature of the political budgetary process as described above. "Type"thus refers to the characteristics of the fiscal process, including the strength of the political forces in pushing for higher spending and higher deficits.

Second, once we realize that what is being signalled is the characteristic of the budgetary process, which reflects the interaction of a large number of political actors, a signal of commitment to fiscal discipline may be important not so much to an outside observer, but to participants in the fiscal process itself. Anything that signals fiscal discipline in the process may thus be self-reinforcing.

Summarizing, a fiscal rule may serve not as an alternative to actions that build reputation, but as one of those actions in itself. When a single policymaker chooses policy, the willingness to adopt rule can convey information about preferences of the policymaker himself, as outlined above. Hence, adoption of a rule can make the commitment to fiscal discipline more credible not because it imposes constraints on a policymaker with a known incentive to fiscal profligacy, but because it signals his commitment. When fiscal outcomes reflect a political process with many actors, a fiscal rule that signals the willingness of those involved in the policy process to limit their own flexibility may similarly convey information about their preferences. However, unlike the case of a single policymaker, it may also convey information about the budgetary process itself. That is, politicians themselves must legislate restriction, their ability to do so may provide information about how the process work that is consistent with the expectation that future budgetary outcomes will be more reflective of fiscal discipline.

1.12   Credible commitment to unchanging fiscal rules: constitutional law

If a fiscal rule is continually being changed, it cannot really be considered a rule. Kopits and Symansky (1998) argue that to be considered a fiscal rule, a restriction, by definition, must be "intended for application

on a permanent basis by successive governments". If a rule is followed by successive governments, it certainly may be seen as a credible commitment to fiscal discipline, while one that is regularly revised is not really a rule. In this respect, only a constitutional law can made credible that existing laws will not be changed whenever current circumstances make it convenient to do so. Constitutional laws refer to at least one of four kinds of laws:

1. those that concern restriction on the government's use of authority

2. those that concern the process of policymaking

3. those that have more stringent amendment procedures than other laws

4. those that often treat issues that are seen as "fundamental"in a deeper conceptual sense, that is, basic rights or liberties.

Fiscal rules may certainly be seen as constitutional in all of the first three senses; the use of constitutional fiscal rules to achieve fiscal discipline may satisfy the fourth characteristic as well. The third and fourth characteristics of constitutional laws are key to making it credible that the law will not be changed whenever circumstances make it tempting. The third characteristic, more stringent amendment procedures, may be thought of as a concrete, rather than conceptual, approach to engendering such an expectation. Such restriction are seen as "protecting the electorate against itself", in that a majority may act under the influence of a "momentary passion".

In short, a promise to follow through on a certain action may be made credible by enacting it into a law which itself is difficult to undo, that is, by constitutionalizing it. Effective commitment follows from the extreme difficulty in changing a law once it is given constitutional status. Raising the cost of deviating (or changing a law) makes it more credible that the law will be followed (or not changed). The fourth characteristic, namely the fundamental nature of the issue that the law addresses is a more conceptual approach to engendering that the law will not be changed whenever it is deemed convenient. A fundamental right, by definition, is one that is seen by its nature as having more permanence than an ordinary piece of legislation.

Hence, giving a provision constitutional status is meant to give it a permanence that it would not otherwise have. In fact, the use of constitutional fiscal rules to achieve fiscal discipline may be seen as meant to send the signal that fiscal discipline is seen as an important or basic goal of society, hence relating to the fourth constitutional characteristic. Zero deficits is not a fundamental right on pair with freedom of speech; a balanced budget restriction in the constitution sends the signal that a society attaches fundamental importance to it. However, since constitutional laws are meant as an extreme form of commitment (an hence loss of flexibility), this solution should be used for fiscal restraint when other solutions have been tried, but have repeatedly failed.
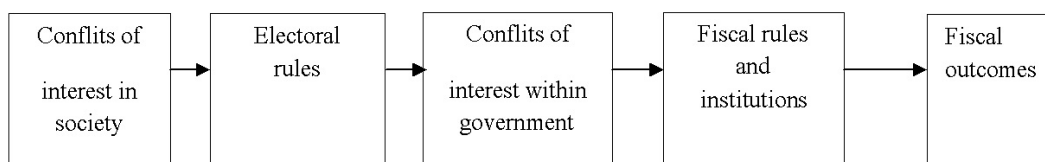
Chapter 2

A common pool model of intergovernmental interactions and fiscal discipline

2.1 Introduction

Traditionally, the rationale for fiscal rules and institutions has been explained by the existence of deficit and spending biases that arise due to political fragmentation within government or between governments that alternate in office. The basic argument is that fragmented decision making increases the perspective on concentrated benefits of fiscal decisions for specific groups or during a specific period of time, while dispersing the costs in the form of general taxation over other groups in society or in time. From the start of the discussion it should however be noted that recent research shows that the origins of political fragmentation may go beyond political decision-making within the government itself. Persson and Tabellini (2004) argue that the degree of political fragmentation within the government is related to the electoral rules in place. As a result, their research stresses the impact of electoral rules on fiscal outcomes. But even this is not the final story given that these electoral rules may be endogenous to the degree of fragmentation within society itself (Aghion et al., 2004). These arguments are combined in Figure 4 that provides a stylised description of the aggregation of individual preferences into fiscal outcomes, first through elections and then through decision making within the government. It indicates that fiscal outcomes may be influenced by (i) the degree of political conflict within society as reflected within the government and (ii) the devices for political conflict resolution, i.e. the rules according to which elections are organised and the fiscal rules and institutions that govern the budget process.

In addition to these arguments, it has also been put forward that both fiscal rules and fiscal outcomes may be determined by a third variable of voter preferences (Poterba, 1996). This argument is important,

Fig. 4 Political conflict and fiscal outcomes

| Conflits of interest in society | Electoral rules | Conflits of interest within government | Fiscal rules and institutions | Fiscal outcomes |

because it would imply that possible correlations between fiscal rules/institutions and fiscal outcomes do not represent causality from rules to outcomes. Such a position would imply that political and institutional variables can only signal underlying preferences within society. For many authors such a position is too extreme, given that the preferences in society could be expected to evolve slowly while empirical research has found specific influences of political and institutional variables on fiscal outcomes. This latter position represents a belief that increased knowledge about and specific reforms to, e.g., electoral rules, fiscal institutions or rules may have an independent effect on fiscal outcomes. In addition, from a more technical angle it is often argued that appropriate instrumental variables are not available for measuring the effect of political and institutional variables on fiscal outcomes so that, indeed, we are left with a belief that there could be a causality from specific institutional variables to fiscal outcomes. For specific applications of this latter argument on the absence of IV-variables, see e.g. Poterba (1996) on fiscal rules, Perotti and Kontopoulos (2002) on political fragmentation and de Haan et a. (1999) on fiscal institutions. The rest of this section discusses the political origins of fiscal indiscipline on the basis of figure 2.1, starting with the electoral rules.

2.2 Electoral rules

Persson and Tabellini (2004) investigate the impact of electoral rules on fiscal outcomes, distinguishing between majoritarian and proportional elections. In proportional elections, the minimal number of voters to win the elections (50 percent) is larger than in majoritarian elections (i.e. winner takes all), where a party can win with just 25 per cent of the votes (50 percent in 50 percent of the districts). Theory predicts that with proportional elections, politicians are induced to support programmes that benefit large parts of the population, such as public goods or welfare programmes. Their empirical results indeed strongly indicate that majoritarian elections lead to smaller governments and smaller welfare programs. The argument is related to theories that explain spending and deficit biases from political fragmentation given that coalition

and minority governments are more likely to emerge under proportional elections, while parliamentary systems are more likely to produce single party majority governments.

2.3   Conflict of interest within and between governments

Political fragmentation within governments ('size fragmentation') - as reflected e.g. in the number of political parties or spending ministers within the cabinet - and between governments ('time fragmentation') are generally seen as the principal political sources of fiscal biases. Many studies on the effects of fiscal rules or institutions choose to base their analysis only one of these concepts. For example, Hallerberg et al. (2007) emphasize size fragmentation, while Debrun and Kumar (2007) base their analysis of fiscal rules on the model of Tabelini and Alesina (1990) on deficit bias due to time fragmentation. An interesting recent innovation is the study by Krogstrop and Wyplosz (2007) that bases its theoretical analysis of fiscal rules on a combination of size and time fragmentation. Size fragmentation is expected to influence budgetary outcomes through the common pool problem. The more fragmented is the system of budgetary decision-making, the weaker are the incentives for each participant to internalize the full tax burden of its spending bids so that a suboptimal level of spending results. This argument has been applied to different settings. The original version of the common pool problem as in Shepsle and Weingast (1981) highlights geographically dispersed benefits of public spending.

Von Hagen and Harden (1994) model the role played by individual spending ministers, while the argument has also been applied to sub-national governments (e.g. Rodden, 2006); in fact it could be applied to any interest group that benefits from targeted expenditures. These static applications explain expenditure pressures, and not necessarily a tendency towards budget deficits. Velasco (1999) shows how the common pool problem may lead to deficits in the context of a dynamic model. In this model, the common pool of tax resources expands to future generations while these resources can be used by running deficits. In addition political fragmentation may also explain why deficits persist despite general recognition that adjustment is needed. The reason is a 'war of attrition' between the coalition parties (Alesina and Drazen, 1991).

Moreover, a variant of the common pool problem has been developed that explains the speedy disappearance of budgetary surpluses due to a voracity effect (Tornell and Lane, 1999; Lane, 2003). In a situation of surpluses, the incentive to act prudently is low within a fragmented political system, as each party knows that if it refrains from using the surplus to implement its desired policy, competing parties will do so. Time fragmentation refers to the limited time horizon of politicians until the next elections. According to the simplest form of the argument, politicians can win support by the electorate by implementing popular fiscal decisions now (extra spending, lower taxes) while shifting the burden to the future. In doing so they may be able to make use of a form of fiscal illusion on the side of the public, that does not fully understand the

nature of the intertemporal budget constraint (Buchanan and Wagner, 1977). If voters are rational or care about the future such an approach will not work, however Tabellini and Alesina (1990) build a model that includes rational voters and in which a deficit bias may emerge given that the incumbent government may use debt as a strategic variable to influence the policy options of its successor.

In the two-period model, the incumbent government can influence policy choices of its successor through the intertemporal budget constraint: a higher deficit and debt will need to be repaid in period two. The incentive to run deficits and leave debt is then larger the lower are the chances for re-election (political instability) and the larger are the differences in policy preferences between alternating parties in power (polarization). The empirical evidence indicates that size fragmentation plays a role in causing spending and deficit biases. Roubini and Sachs (1989) were the first to test empirically for the impact of fragmentation on fiscal outcomes while Perotti and Kontopoulus (2002) find that fragmented government, as measured by the number of spending ministers, has an impact on expenditure outcomes and to a lesser extent also for the budget balance. The empirical evidence regarding the impact of the frequency of government changes (time fragmentation) and polarization on the budget balance is however more mixed (see Drazen, 2000, for an overview of the literature). Both Grilli et al. (1991) and Hallerberg and Von Hagen (1999) find that time fragmentation matters. However, Ricciuti (2004) finds no evidence that is does (while he does find evidence is support of size fragmentation, confirming earlier results of Perotti and Kontopoulos, 2002). Furthermore, Grilli et al. (1991) find no evidence that political polarization of subsequent governments matters.

2.4 Solutions that remove incentives for political biases: Fiscal committees

Deficit and spending biases arise due to the political nature of fiscal decision-making. As a result, the incentives for biased policies could be removed or softened by taking (part of) the decision-making authority out of the political arena. A number of authors have therefore proposed to solve the deficit bias by delegating fiscal policy authority to independent fiscal committees (Fatás et al. 2003, Calmfors, 2003, Wyplosz, 2005; IMF, 2005, provides an overview). Proposals for independent fiscal committees (IFCs) are theoretically appealing, given that they remove policy biases instead of counterbalancing them through fiscal rules. Whereas fiscal rules involve a trade-off between commitment to a constraint and a loss of flexibility for dealing with unforeseen circumstances, IFCs can overcome this trade-off by setting the incentives right and relying on judgement (Wyplosz, 2005).

Moreover, proponents point to the analogy with monetary policy. The inflation bias has been solved by delegating policy authority to independent central banks. Could a similar solution be feasible for fiscal policy? Whereas for monetary policy, independent central banks have become the standard in advanced economies, proposals for independent fiscal committees have however not been implemented anywhere in

practice. Against this background, we first review different proposals for IFCs and then try to understand why the use of IFCs - as a possible alternative to the use of fiscal rules - has not taken off in recent years. Figure 5 compares key elements of proposals for independent fiscal committees as brought forward in recent studies. In all proposals, the IFC should consist of independent experts from academia or policy circles. Opinions differ, however, with respect to the ultimate objective that the committee should pursue. In the proposal of Calmfors (2003) the IFC should focus on stabilisation policy, given that in EMU national fiscal policy plays an important role in adjustment to asymmetric macro-economic shocks. In the proposals of Fatás et al. (2003) and Wyplosz (2005) maintaining fiscal sustainability is the main objective of the IFC, given that respecting the intertemporal budget constraint is the overriding macroeconomic objective in fiscal policy. In all proposals, objectives are made operational by setting yearly objectives in terms of the budget balance. At the same time, the actual implementation of fiscal policy, i.e. the decision on concrete expenditure and revenue policies for achieving the targets as set by the IFC, would remain in the hands of the government.

A main argument underlying this division of responsibilities is that fiscal policy has redistributive consequences. Therefore, the ultimate decision on specific policies should remain within the political arena. Moreover, this division of responsibilities would help to ensure the democratic legitimacy of fiscal policy.

Finally, it should be noted that most proposals for IFCs are meant for implementation at the national level. An exception is the proposal by Fatás et al. (2003) that is meant as an alternative to the fiscal rules of the stability growth pact (SGP). They therefore propose the establishment of an IFC at the level of the EU. The literature on IFCs contains an appealing analogy with monetary policy. The mandate of central banks is to maintain price stability, while possibly also supporting sustainable growth. Similarly, the mandate of IFCs could be to ensure debt sustainability, while providing an adequate degree of short-run cyclical stabilization. Operational objectives for central banks are defined in terms of ranges for inflation rates, while the target for the IFC could be formulated in terms of the budget balance. Independent central banks have managed to stabilize inflation expectations and conquer the inflation bias. IFCs can therefore be expected to conquer the deficit bias in similar fashion.

So if the case for IFCs is so strong, why have they not been introduced anywhere in practice? The main argument is that IFCs appear contradictory with parliamentary sovereignty with respect to fiscal policy (EC, 2006), although proponents of IFCs argue that these issues can be solved by leaving the execution of fiscal policy in the hands of the fiscal authorities. This is, however, exactly the point where the analogy with monetary policy does not hold any longer. Monetary policy authorities are able to immediately implement decisions they take on the short term interest rate. IFCs, on the contrary, would have to depend on the government to take the necessary measures for achieving the budget balance targets as set by the IFC.

At this point, we note that a conflict of interest may actually arise between the IFC and the government

Fig. 5 Compared proposal for Fiscal Policy Committees

	Fatas et al (2003)	Calmfors (2003) I	Calmfors (2003) II	Wyplosz (2005)
Membership	Independent experts appointed on part time basis except for chair	Independent experts, appointed for long term and non renewable terms of office	Independent experts, appointed for long term and non renewable terms of office	Independent experts appointed for long, non-renewable terms of office
Objective	Sustainablity	Stabilization	Stabilization	Sustainability
Operational objective	Judge compatibility of national fiscal plans with sustainablity objective	Set target for annual budget balance	Set target for annual budget balance	Set debt target and target for annual budget balance
Instrument	Veto fiscal plans that are not in line with sustainablity; Political pressure through public opinion and financial market reactions	Obligation for Cabinet and Parliament to achieve targets for the balance through specific tax and spending measures. The budget bill requires FPC approval	Parliament delegates to FPC the right to vary certain tax rates or expenditures within predetermined levels	Obligation for Cabinet and Parliament to achieve targets for the balance through specific tax and spending measures. The budget bill requires FPC approval
Accountability	Reports to and hearings in EU Parliament; Right of EUP to dismiss Committee	Right of Parliament to dismiss the FPC	Right of Parliament to dismiss the FPC	FPC accountable to Parliament
Application at national or Eu level	Euro area	National	National	National

or parliament. This issue is very similar to enforcement issues that arise with fiscal rules. What are the incentives for the government to comply with the budget balance as set by the IFC instead of following its own (but biased) policies? What would happen if it turns out ex post that the government did not respect the objectives as set by the IFC? What would happen if the government would refuse to take the necessary measures for bringing down the budget deficit? One possibility as indicated in Fig.5 is that to IFC may be given the authority to veto the budget. However, the proposals also favour that the IFC should be accountable to Parliament, so that Parliament could dismiss the IFC in case of a conflict of interest. In the absence of incentives for the government and parliament to follow the fiscal objectives as set by the IFC, and given the lack of enforcement mechanisms for a committee of experts with respect to democratically elected politicians, it would seem that there is an essential flaw in proposals for IFCs.

2.5 Solutions that remove incentives for political biases: Reducing political fragmentation

In theory, the deficit bias could be solved by delegating the decision on the budget balance to an independent committee. In the same way, spending biases could be solved by eliminating or reducing the degree of fragmentation in the budget process. A proposal made by Perotti and Kontopoulos (2002) goes in this direction. After having shown that fragmentation, as measured by the number of spending ministers in the cabinet, matters for expenditure outcomes, they then propose that reducing the number of spending ministers may be a feasible option for addressing spending biases. As with proposals on IFCs, the proposal to reduce the number of spending ministers has not been implemented in practice. One possible explanation could be that, if - as we have seen before - the degree of political fragmentation within the government results from the electoral rules in place and the degree of fragmentation within society, then it may also be difficult to change the number of spending ministers without changing these underlying variables.

2.6 Solutions that counteract incentives for political biases: strong minister of economics and other fiscal institutions

In common pool models fiscal outcomes are determined, first, by the degree of political fragmentation and, second, by the decision-making rule that is used to aggregate conflicting interests into a single budget. The rules according through which the budget is prepared, approved and carried out - in short the fiscal institutions - may therefore act to counteract political biases that are rooted in political fragmentation. We briefly recall the rationale for fiscal institutions as well as the empirical evidence.

Von Hagen (1992) is the first to investigate the impact of budgeting procedures on fiscal performance in EU countries. The idea is that the common pool problem may manifest itself during different phases of the budgetary process. When the budget is drafted within the cabinet, biases may arise due to the fact that spending ministers may recognize the full benefits of their own specific spending proposals, but fail to internalize the costs for the tax-paying population at large. During the decision-making procedure on the cabinet proposals in parliament, individual members of parliament may internalize the interests of specific constituencies within society but not the costs of their amendment proposals for society as a whole. Finally, biases may again show up during the implementation phase of the budget, in the way policy reacts to unforeseen events and the way supplementary budgets are drafted, decided upon and implemented.

Several institutional responses are possible for internalizing the overall costs of budgetary programs. These costs could be internalized by giving a strong mandate to the minister of finance, whose role is to consider the overall effects of policies. In addition, fiscal rules may be conducive to fiscal discipline given that they put a constraint on fiscal policy outcomes.

Moreover, during the parliamentary stage, the role of amendments powers is expected to matter, especially when these powers are not complemented by the obligation to find adequate financing for new spending proposals.

Finally, during the execution of the budget, the degree of flexibility as reflected for example in spending limits or no carry over provisions would be expected to play a role. Overall, von Hagen (1992) calculates an index that combines all these elements in one single number, on the basis of an equal weighting of all the individual elements. Alesina et al. (1996) also investigate the hypothesis that institutions matter, but organize their aggregate index of institutions in a different way. Their aggregate index also contains three elements that may be conducive to fiscal discipline. The first is ex ante fiscal constraints. Such constraints may include fiscal rules, but also requirements that the budget should be consistent with a macroeconomic program approved ex ante. The second is top-down hierarchical procedures. These include the position of the minister of finance within the cabinet, but also the type of amendment rules as used in the discussion with parliament. The third is fiscal transparency. No transparent budgets may allow politicians to strategically manipulate information, so that they can appear fiscally restraint even when their actions are in fact undisciplined. The empirical evidence using aggregate indices of budgetary institutions for explaining budgetary outcomes strongly indicates that institutions matter.

By now the same overall conclusions have been reached for different sample periods and different groups of countries. For example, De Haan et al. (1999) and Hallerberg et al. (2001) focus on EU countries, Gleich (2003), Yläoutinen (2004) and Fabrizio and Mody (2006) all concentrate on central and eastern European countries while Alesina et al. (1996) focus on Latin American countries.

Moreover, methodologies have evolved from bivariate analysis as in Von Hagen (1992) to the use of

panel studies that employ time variation in the index of institutions and control for a range of variables, as in de Haan et al. (1999), Hallerberg et al. (2001) and Fabrizio and Mody (2007).

In sum, a growing body of empirical evidence has indicated that institutions matter. Apart from issues concerning the direction of causality between fiscal institutions and fiscal outcomes, another criticism on this direction of research is that it is less clear which institutions matter (Poterba, 1996). In the indices used, all institutional elements are equally weighted and are therefore seen as perfect substitutes. In order to address this issue, both De Haan et al. (1999) and Fabrizio and Mody (2007) concern the question which sub-indices matter most, on the basis of separate regressions that include these sub-indices. The conclusion reached by De Haan et al. (1999) is that the position of the legislature, the presence of binding constraints and flexibility during the execution of the budget seem to matter most. Fabrizio and Mody (2007) conclude that, while each individual component of the budget process matters (i.e. budget preparation, authorization and implementation), the implementation phase seems to matter most, thus showing only partial overlap with earlier findings of De Haan et al. (1999).

2.7   The Common Pool Problem of Budget Process

The idea that a common pool problem is intrinsically rooted in the typical public budget process can be traced back to the paper by Weingast, Shepsle, and Johnsen (1981). Focusing on the parliamentary stage of the budget process, they consider a legislature made up by representatives with a geographically based constituency and explain why a cooperative legislature would stand for policies that are Pareto dominated. The legislature will oversupply those programs that concentrate the benefits in geographically specific constituency, while spreading their costs across all constituencies through generalized taxation. In other words, each representative will fail to internalize the full cost, in terms of deployment of the common pool of national tax revenues, of financing expenditure programs that benefit mainly his constituency. The divergence between real and perceived costs will be wider, and hence the commons problem more serious, the more fragmented is the legislation. Taken at its face value, this model explains nothing more than the tendency for a parliamentary determined budget to exhibit a level of expenditure on "pork barrel"projects higher than it is economically warranted. In fact, the more recent literature has built on the same basic idea to provide a representation of the government stage of the budget process and to generate a bias toward excess deficits as well as excess public spending. One can reasonably replace the geographically based constituency of a representative in the legislature with the special-interest based constituency of a spending ministry in the government.

A good example is von Hagen and Harden (1995), who consider a government consisting of n spending ministers. The budget allocates public funds, raised through distorting taxation, to spending ministers, each

of them pursuing its policy target. Collectively, the cabinet would wish to minimize the divergence between policy targets and actually allocated funds and, at the same time, to minimize the excess burden of taxation.

The common pool problem arises, as in Weingast et al. (1981), from the fact that each spending minister takes into account only a share of that excess burden: the portion that falls on his constituency.

From this premise, the budget released by the cabinet is going to depend critically on the decision-making procedure. If the procedure entails collecting each minister's bid and taking a vote on the resulting budget, we are in the reign of what Weingast et al. (1981) labeled as "universalism" and "reciprocity" (any spending unit will get some funds and a process of mutual support and logrolling will be established), where the final budget will exhibit a spending bias.

As noted in several evaluations of the literature on budget institutions (e.g., Alesina and Perotti, 1995), early models with government resources as "common property"explain how budget procedures can have an implicit bias toward overspending and then excess budget size, but they do not say anything about the budget deficit.

More recent models (Hallerberg and von Hagen, 1999; Velasco, 2000) show that the "common property"approach is able to generate excess deficits as well. For example, Hallerberg and von Hagen (1999) propose an extension to two periods of the model of budgeting within government by von Hagen and Harden (1995). The budgeting decision now involves not only allocating funds among the spending ministers but also setting taxes endogenously in order to meet the intertemporal budget constraint. Again, individual spending ministers would disregard the externality arising from their expenditure decision, and hence in a completely decentralized budget process both spending and borrowing (in the first period) would be inefficiently high.

There are two ways of reducing the spending and deficit bias arising from the coordination problem in the budget process: either delegation of authority to a "fiscal entrepreneur"(the finance minister) or commitment by the whole government to a set of binding limits on expenditure allocations collectively negotiated at the beginning of the budgeting process. The larger the finance minister's agenda-setting power, the closer the deficit comes to the collectively optimal outcome. Under the commitment approach, the multilateral nature of the negotiations on fiscal targets implicitly forces all participants to consider the full cost in terms of tax burden associated with additional spending.

Hallerberg and von Hagen (1999) note that both approaches require that the finance minister is vested with enforcement powers in the implementation phase of the budget (in short, there is an efficient system of public expenditure control and management), in order to neutralize the incentive that single spending ministers will have to defect from the approved budget.

2.8 Model and results

We consider a two-period model of budgeting in a cabinet government consisting of $i = 1, ..., n+1$ agents: n spending ministers and the finance minister, who is independent from interest groups (benevolent social planner).

Government expenditures consist of transfer x_i to groups i in society. Revenues are given by taxes levied on all groups of society and borrowing. In the first period borrowing must be repaid with interest in the second period. We assume that government can borrow or lend at a fixed real interest rate, r. In the second period, government receives an amount τ_2 of nontax revenue[1]. The resulting intertemporal budget constraint involves a trade-off between the benefit from paying out more transfers in the first period and the cost of taxation in second period. As in ([30]), the intertemporal utility function of each spending ministers is:

$$U(x_{t,i}) = -\frac{1}{2} \sum_{t=1}^{2} \delta^{t-1} \left[x_{t,i} - x_{t,i}^{\star} \right]^2 - m_i \delta \Gamma(T).$$

with $i = 1, ..., n+1$, δ is the discount rate, $0 < \delta < 1$, $x_{t,i}$ is the level of spending allocated to minister i and $x_{t,i}^{\star}$ is the ideal level of spending from perspective of a single spending minister. We assume that $x_i^{\star} = x_{1,i}^{\star} = x_{2,i}^{\star}$.

Each m_i denotes the share of the excess burden from taxation falling on the minister i's constituency, with $m_i < 1$ and for simplicity $m_i = 1/(n+1)$. The excess burden of taxation, i.e. the cost of taxation, is given by a C^2 and convex function:

$$\Gamma(T) = \frac{1}{2} \theta T^2 \tag{2.1}$$

and the marginal cost of taxation increases with the level of taxation with $\theta > 1$.

The intertemporal government budget constraint over the two periods is

$$T(x_{t,i}) = rB_1 + B_2 - \tau_2$$

where $B_t = \sum_{i=1}^{n+1} x_{t,i}$ for each period $t = 1,2$ is the total expenditures in period t, r is the real interest factor for the government and τ_2 is the exogenous nontax revenue in second period.

2.8.1 Decentralized budget process

We first consider the case in which all the spending ministers maximize their individual utility function subject to the intertemporal budget constraint, taking the other ministers' bids as given.

Spending ministers are left to determine their own budgets and we show that the structure of the bargaining process within the cabinet affects the size of the budget.

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[1] By simplicity, we assume that first period tax revenue is equal to zero.

Each minister maximizes his utility function subject to the intertemporal budget constraint.

$$\max_{x_{t,i}} U(x_{t,i}) = -\frac{1}{2} \sum_{t=1}^{2} \delta^{t-1} \left[x_{t,i} - x_{t,i}^{\star} \right]^2 - m_i \delta \Gamma(T)$$

$$\text{subject to } T(x_{t,i}) = r(x_{1,1} + \sum_{i=1}^{n} x_{1,i}) + (x_{2,1} + \sum_{i=1}^{n} x_{2,i}) - \tau_2.$$

First order conditions for each $i = 1, ..., n+1$ in each period t are:

$$\begin{cases} \frac{dU_i}{dx_{1,i}} = -(x_{1,i} - x^{\star}) - m_i \delta \theta r \left[r(x_{1,1} + \sum_{i=1}^{n} x_{1,i}) + (x_{2,1} + \sum_{i=1}^{n} x_{2,i}) - \tau_2) \right] = 0 \\ \frac{dU_i}{dx_{2,i}} = -(x_{2,i} - x^{\star}) - m_i \delta \theta \left[r(x_{1,1} + \sum_{i=1}^{n} x_{1,i}) + (x_{2,1} + \sum_{i=1}^{n} x_{2,i}) - \tau_2) \right] = 0 \end{cases} \qquad (2.2)$$

Summing up over all agents foc conditions gives the government spending level in period $t = 1$ and $t = 2$

$$\widehat{B}_1 = \frac{\left[1 + \delta \theta (1 - r) \right] B^{\star} + \delta \theta r \tau_2}{1 + \delta \theta (1 + r^2)} \qquad (2.3)$$

$$\widehat{B}_2 = \frac{1}{1 + \delta \theta} \left[B^{\star} + \delta \theta \tau_2 - \delta \theta r \widehat{B}_1 \right]$$

Using (2.3), we obtain the level of taxes in period $t = 2$ as

$$\widehat{T} = \frac{(1 + r)B^{\star} - \tau_2}{1 + \delta \theta (1 + r^2)} \qquad (2.4)$$

The optimal levels for each individual spending ministers from the simultaneous equilibrium are:

$$\widehat{x}_{1,i} = x^{\star} - m_i \delta \theta r \widehat{T}$$
$$\widehat{x}_{2,i} = x^{\star} - m_i \delta \theta \widehat{T}. \qquad (2.5)$$

Minister i obtains a utility level given by

$$\widehat{U} = \frac{m_i \delta \theta}{2} \frac{((1 + r)B^{\star} - \tau^2)^2}{(1 + \delta \theta (1 + r^2))^2} (1 - m_i \delta \theta (\delta + r^2)) \qquad (2.6)$$

for each $i = 1, ..., n+1$.

2.8.2 A Strong Finance Ministry

Hallenberg and al.([30]) consider three cases: first a single planner with a fixed weight of taxation in the budget; second, the budgeting decision over the n spending ministers which in bidding for funds take into account only that part of the excess burden of taxation levying on their constituency; finally, a delegation model with a strong finance minister with a weighted utility function. In their analysis, the parameter m plays a central role in order to capture the size of the common-pool problem. Finance minister's interest generally coincide with the general interests. He has the responsibility to coordinate the formation of the budget and his goal is the size of the budget deficit. Formally, in the main literature the finance minister will submit proposal for transfers that maximize his utility function under the constraint that each spending minister obtain sufficient utility, i.e. finance minister maximizes a weighted utility function. Spending ministers support a strong finance minister, as they obtain greater utility.

However, given that $n-1$ spending ministers adhere to strong minister's budgeting decision, the $n-th$ minister has incentive to deviate, as he disregard the externality resulting from the common revenue fund and will increase is spending. In this way, the finance minister needs, in addition to agenda setting power, an enforcement power to ensure his decision holds. In conclusion, Halleberg and al. give an example of enforcement power as the "control device, like the requirement to obtain authorization for disbursing public funds during the fiscal year"[2].

In order to model the interaction between Finance Minister and spending ministers, we consider a sequential mechanism in which the Finance Minister precommits fiscal policy and observes the n spending ministers' optimal choices. This means that Finance Minister acts as a leader and the n spending ministers as followers.

Leader ministry can commit itself to a spending level that the followers are forced to take as given when making its own spending decisions. Finance Minister acting first, will choose a higher level of public spending and will distribute it in favour of spending ministers at the end of the second period. In such way, (a) we model a *benevolent* Finance Minister whose agenda setting power limits the deficit spending bias, and (b) we obtain a mechanism of power enforcement for the second period.

The timing is the following: in the first stage, Finance Minister chooses his spending level for both period maximizing his utility function; in the second stage, spending ministers observe Finance Minister choices for each period, and maximize their utility function simultaneously.

Each spending ministers share the excess of the burden taxation as the parameter $m_i = \frac{1}{n}$ with $m_i < 1$, while Finance Minister's parameter m measures the common pool externality and represents the perception of burden taxation. In such way, different from spending ministers, Finance Minister internalizes the cost of taxation. In the sequential approach, spending ministers continue to take into account only the portion

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[2]In Italy, such instrument in the form of linear cutting spending power was given to the Dept. of General State Account.

$m_i = \frac{1}{n}$ of the cost of taxation when making the budget bids, while the Finance Minister takes the entire cost of taxation into account.

Sequential mechanism

Finance Minister's optimal choices are the solution of the following utility maximization

$$\max_{x_{t,1}} U(x_{t,1}) = -\frac{1}{2}\sum_{t=1}^{2}\delta^{t-1}\left[x_{t,1}-x_{t,1}^{\star}\right]^2 - m\delta\Gamma(T)$$

$$\text{subject to } T(x_{t,i}) = r(x_{1,1}+\sum_{i=2}^{n+1}x_{1,i})+(x_{2,1}+\sum_{i=2}^{n+1}x_{2,i})-\tau_2.$$

As usual, we solve the problem "in reverse ". Supposing that Finance Minister is the leader and spending ministers are the followers, then given leader choices, spending ministers acting simultaneously want to solve:

$$\max_{x_{t,i}} U(x_{t,i}) = -\frac{1}{2}\sum_{t=1}^{2}\delta^{t-1}\left[x_{t,i}-x_{t,i}^{\star}\right]^2 - m_i\delta\Gamma(T)$$

$$\text{subject to } T(x_{t,i}) = r(x_{1,1}+\sum_{i=1}^{n}x_{1,i})+(x_{2,1}+\sum_{i=1}^{n}x_{2,i})-\tau_2.$$

for all $i = 2,...,n+1$.

First order conditions for each $i = 2,...,n+1$ in each period t are:

$$\begin{cases} \frac{dU_i}{dx_{1,i}} = -(x_{1,i}-x^{\star})-m_i\delta\theta r\left[r(x_{1,1}+\sum_{i=2}^{n+1}x_{1,i})+(x_{2,1}+\sum_{i=2}^{n+1}x_{2,i})-\tau_2)\right]=0 \\ \frac{dU_i}{dx_{2,i}} = -(x_{2,i}-x^{\star})-m_i\delta\theta\left[r(x_{1,1}+\sum_{i=2}^{n+1}x_{1,i})+(x_{2,1}+\sum_{i=2}^{n+1}x_{2,i})-\tau_2)\right]=0 \end{cases}$$

Spending ministers play simultaneously each other, and the optimal choices are

$$\widetilde{x}_{1,i} = x^{\star} - m_i\delta\theta r\widetilde{T}$$

$$\widetilde{x}_{2,i} = x^{\star} - m_i\delta\theta\widetilde{T}. \tag{2.7}$$

The Finance Minister problem now is:

$$\max_{x_{t,1}} U(x_{t,1}) = -\frac{1}{2}\sum_{t=1}^{2}\delta^{t-1}\left[x_{t,1}-x_{t,1}^{\star}\right]^2 - m\delta\Gamma(T)$$

$$\text{subject to } T(x_{t,i}) = r(x_{1,1}+\sum_{i=2}^{n+1}\widetilde{x}_{1,i})+(x_{2,1}+\sum_{i=2}^{n+1}\widetilde{x}_{2,i})-\tau_2.$$

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and first order conditions are

$$\frac{dU_1}{dx_{1,1}} = -(x_{1,1} - x^\star) - m\delta\theta(r - \delta\theta r^2 - \theta r)\left[r(x_{1,1} + \sum_{i=2}^{n+1}(x^\star - m_i\delta\theta rT))\right.$$
$$\left. + (x_{2,1} + \sum_{i=2}^{n+1}(x^\star - m_i\theta T)) - \tau_2)\right]$$

$$\frac{dU_1}{dx_{2,1}} = -(x_{2,1} - x^\star) - m\delta\theta(-\delta\theta r^2 - \theta + 1)\left[r(x_{1,1} + \sum_{i=2}^{n+1}(x^\star - m_i\delta\theta rT))\right.$$
$$\left. + (x_{2,1} + \sum_{i=2}^{n+1}(x^\star - m_i\theta T)) - \tau_2)\right]$$

Summing up over all agents f.o.c. conditions gives the government spending level in period $t = 1$ and $t = 2$, and let $h = 1 + m - m\theta(1 + \delta r^2)$

$$\widetilde{B}_1 = \frac{[1 + \delta\theta h(1-r)]B^\star + \delta\theta rh\tau_2}{1 + \delta\theta h(1+r^2)} \tag{2.8}$$

$$\widetilde{B}_2 = \frac{B^\star + \delta\theta h\tau_2}{1 + \delta\theta h} - \frac{\delta\theta hr}{1 + \delta\theta h}\widetilde{B}_1$$

Using (2.8), we obtain the level of taxes in period $t = 2$ as

$$\widetilde{T} = \frac{(1+r)B^\star - \tau_2}{1 + \delta\theta h(1+r^2)} \tag{2.9}$$

The finance minister's optimal choices are

$$\widetilde{x}_{1,1} = x_1^\star - m\delta\theta r\widetilde{T}\left[1 - \theta(1 + \delta r^2)\right]$$
$$\widetilde{x}_{2,1} = x_2^\star - m\delta\theta\widetilde{T}\left[1 - \theta(1 + \delta r^2)\right] \tag{2.10}$$

With these allocations, Finance Minister obtains an utility level given by

$$\widetilde{U}(x_{t,i}) = \frac{m\delta\theta}{2}\frac{((1+r)B^\star - \tau^2)^2}{(1 + \delta\theta h(1+r^2))^2}(1 - \delta\theta(\delta + r^2)\frac{(h-1)^2}{m}) \tag{2.11}$$

and each spending minister i obtains a utility level given by

$$\widetilde{U}(x_{t,i}) = \frac{m_i\delta\theta}{2}\frac{((1+r)B^\star - \tau^2)^2}{(1 + \delta\theta h(1+r^2))^2}(1 - m_i\delta\theta(\delta + r^2)) \tag{2.12}$$

2.9 Conclusion

In a completely decentralized budget process, each spending minister bids for and obtains the funds maximizing their utility given the bids of the others spending ministers. In this approach also the Finance

Minister is a spending minister without any special strategic power that allow him to coordinate budget decisions. Finance Minister in bidding for funds takes into account only that part of excess burden of taxation. In the main literature, is well known that all ministers disregard the externality resulting from the common revenue fund and, hence, spend and borrow more than a single benevolent planner would.

In this work, we consider an institutional mechanism to achieve budget decisions that are closer to the one that is collectively optimal for the government. One member of the government, i.e. the Finance Minister, has the function to monitor the others using selective incentives. His interest generally coincide with the general interests and has the responsibility to coordinate the formation of the budget. In such way, the size of the budget deficit is often the principle indicator of his effectiveness. The Finance Minister's staff gives him the instruments to monitor the actions of the other ministries. The Finance Minster's enforcement and agenda setter powers are strictly linked with the parameter m: the larger m is, the higher the perception of the common pool problem and the closer the deficit comes to the optimal outcome.

This discussion can be summarized in the results. We consider the total tax burden in (2.4) and (2.9), and being $0 < h < 1$, we have that the tax burden in sequential model is bigger than in simultaneous. Comparing deficit levels in (2.3) and in (2.8), obtain the expected result

$$\widetilde{B} - \widehat{B} > 0 \tag{2.13}$$

The greater are m and θ, the bigger is the difference in (2.13). Increasing the marginal cost and the internalized burden of taxation, the common pool problem as regarded by the Finance Minister increases.

Considering optimal spending level of Finance Minister in (2.5) and (2.10), we obtain that in decentralized model the optimal choice is smaller than in sequential. Leader ministry can commit itself to a spending level that the followers are forced to take as given when making its own spending decisions. Finance Minister acting first, will choose a higher level of public spending and will distribute it in favour of spending ministers at the end of the second period. In such way, we have modelled a *benevolent* Finance Minister whose agenda setting power limits the deficit spending bias, and we have obtained a mechanism of power enforcement for the second period.

On the other hand, the results for spending ministers' optimal choices are:

$$\widetilde{x}_i < \widehat{x}_i$$

for all $i = 2, ..., n+1$. In this sense, we obtain a smaller deficit bias related to delegation of decision and monitoring power to a strong finance minister.

With these allocations, utility levels for both Finance Minister and spending ministers are:

$$\widetilde{U}_i > \widehat{U}_i$$

for all $i = 1, ..., n+1$. Thus, each spending minister benefits from centralizing the budget process in a strong Finance Ministry. Our centralized solution yields higher utility for each spending minister and also for Finance Minister, and it is a Nash equilibrium. This implies that Finance Ministries have strong enforcement powers to implement their budget.

Remark 2.9.1 *Analysing $0 < h < 1$, we obtain that when $h \to 1 \quad \Leftrightarrow m \to 0$ imply $\widetilde{T} = \widehat{T}$ and $\widetilde{B} = \widehat{B}$, i.e. the Finance Minister doesn't completely internalize the common pool problem.*

Chapter 3

Do fiscal institutions impact fiscal performance?

3.1 Introduction

A point of debate among economists is whether the public sector should intervene or not in the short-term fluctuations in economic activity. If classical economists have always opposed such a kind of public action, the Keynesian school of thought invoked fiscal policies to support the economy during recessions. In fact, the classical economists believed that market forces were able to quickly bring economies to a long-run equilibrium, through adjustments in the labour market. Instead, the Keynesians took the fallibility of such self-regulatory mechanisms, precisely because of rigidities in the labour market. To this end, the school has prescribed Keynesian expansionary fiscal policies in order to avoid long slumps.

Over time, many studies have focused their attention on testing the Wagner's law (Wagner, 1912) which is opposed to the Keynes's overview. According to Wagner, there would be a one-sided direction that goes from the economic activity (GDP) to the total government spending (TGS). This link is due to the simple fact that an increase of the wealth of a community, related to national disposable income, leads to the increase of public spending as citizens demand more complex and costly services, consistent with their needs. It certainly takes a lot of relevance to the debate on the sustainability of public spending, where its identification would provide some theoretical importance.

If government spending grows faster than fiscal taxation, the issue is to heal the public deficit that occurs in two main ways: (i) fiscal tightening or (ii) debt.

However, one of the main problems underlying the theory is represented by the identification of the maximum limit of public expenditure that is not exceeded. Over time, many have tried to give an answer to

this question.

In 1879, Beaulieu stated that the maximum amount of public spending is determined by the maximum tax that citizens believe bear (which binds taxation in public spending).

Clark (1945), however, sustained the idea that government spending should not exceed 25% of the national income. In fact, the increase of fiscal taxation on businesses causes a rise in prices and, hence, an increase in inflation.

In 1976 Friedman asserted that the relationship between public spending and income should not exceed 60%. Finally, Brennan (1980) was convinced that the limit of the expenditure was a social contract between rulers and ruled that establishes the maximum level of taxation and public expenditure.

The hypothesis of unilateral directionality (or Wagner's law) is supported empirically by many studies (among them Ahsan et al., 1996 and recently Sideris, 2007; Kumar et al., 2009; Maamor and Abdullah, 2010). In this work, we will not test the causality between the variables of the model, but we will follow the line suggested by Wagner's theory[1].

The Wagner's law has been tested empirically for various countries using cross-section, time series and panel data. In this sense, the cointegration relation and Granger causality has been tested achieving results rather conflicting with each others (see Tarschys 1975, Peacock and Scott 2000 for a critical review of recent work on the Wagner's law).

Referring to Italian case, our contribution to the literature is not only to give a new evidence on relationship between GDP and public spending in Italy, but above all to identify which policies, concerned to the Italian budget rules and procedure, occurred between 1970 and 1990 period, may be relevant in order to explain this nexus.

In particular, following Gregory and Hansen (1996), we will use the ADF test in order to estimate the relationship between economic activity and public expenditure with and without structural breaks. Moreover, to give additional information to the relationship between GDP and public expenditure and on the basis of the theories that have tried to determine the maximum limit which the public expenditure must not exceed, we will include in our analysis also the fiscal taxation. According to our point of view, it could be useful to understand the mechanism that link taxation, public spending and economic growth due to the fact that the higher the economic growth, the higher the fiscal taxation that would cause an increase in public spending.

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[1]In the immediate future, we will need to test the causality relationship to give confirmation to this theory. In contrast to the theory proposed by Wagner, there are other points of view, including: (i) the assumption of neutrality, where the variables are not correlated (see Demirbas, 1999; Huang, 2006; Chimobi, 2009; Afzal and Abbas, 2010), (ii) the Keynesian hypothesis, where it is argued that public spending causes economic growth (Babatunde, 2007 and Govindaraju, 2010; finally (iii) the possibility of feedback, where there is a bi-directionality between GDP and public spending (see Thornton, 1999, Chow et al, 2002; Narayan et al. 2008 and Yay and Tastan, 2009).

A VECM is employed in order to interrogate how public spending reacts to a positive shocks in GDP and fiscal taxation. For robustness check, we will test even the opposite relationship, i.e. as GDP and taxation react to positive shocks in public spending.

The rest of the chapter is organized as follows. Section 3.2 describes the methodology. Section 3.3 gives empirical evidences of our work.

3.2 The empirical methodology

Our analysis is carried out in two step. First step, we test the cointegration relation on Wagner's law using augmented Dickey-Fuller (ADF) test on residual-based following this model:

$$\ln TGS = \alpha + \alpha_1 \ln GDP + \alpha_2 \ln TFT + \varepsilon_t \tag{3.1}$$

where TGS is the total government spending, GDP denotes the gross domestic product and TFT describes the total fiscal taxation. All variables are in natural logarithm. Specifically, ADF test performs that a variable follows an unit-root process, where the null hypothesis is that the variable contains an unit root, and the alternative is that the variable was generated by a stationary process. The candidate cointegrating relation is estimated by ordinary least squares (OLS), and an unit root test is applied to the regression errors as follows:

$$\varepsilon_t = \beta_i \varepsilon_{t-i} + \vartheta_t \tag{3.2}$$

where ε_{t-i} are the regression errors and ϑ denotes a time trend.

Basically, the analysis has been confined to the question of Wagner's law residual-based tests for cointegration in the presence of a regime shift. In particular, we want to determine whether the cointegrating relationship associated to the Wagner's law has been subject to a regime shift. In our case, four different structural breaks[2] related to Italian budget rule and procedure from 1970 to 1990 period are taken into account.

Following Gregory and Hansen (1996), we then calculate ADF* test in which some relevant structural changes are taken into account in the relationship. In particular, they extend this family of statistic test to verify the null hypothesis of no cointegration against the alternative of cointegration in the presence of a possible one-time regime shift of unknown timing. Rejection of the null hypothesis, therefore, provides evidence in favour of this specification.

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[2] 1978 (Law no. 468): Basic Law of the budget. Introduction of the budget bill; 1988 (Law no. 362): Amendments to the 468/1978 law. Strengthening coverage obligation. Introduction Planning Document. Resizing the Finance Act. Edit Regulations parliamentary; 1981: divorce between Treasury and the Bank of Italy; 1997 (Law no. 94 - Ciampi's reform): Merging the Ministries of Budget and Treasury into a single Ministry: Strengthening the Ministry of Economy

It is important to note, however, that this type of hypothesis test does not provide much evidence concerning the question of whether or not there was a regime shift, since the alternative hypothesis contains as a special case the standard model of cointegration with no regime shift.

Generally speaking, the standard ADF statistic and ADF* statistics suggested by Gregory and Hansen (1996) both test the null hypothesis of no cointegration, so rejection by either statistic implies that there is some long-run relationship in the data.

If the standard ADF statistic does not reject, but the ADF* does, this implies that structural change in the cointegrating vector may be important.

If both the ADF and the ADF* reject, no inference that structural change has occurred is warranted from this piece of information alone, since the ADF* statistic is powerful against conventional cointegration[3].

In equation (3.2), ADF (without break) and ADF* (with some breaks) are performed including a constant (μ) (i.e C test) and a constant and a trend (τ) (i.e. C/T test).

Second step, we identify the model in order to interrogate on dynamic response of each variable (or TGS) following a positive shock to another ones (GDP and TFT). In these context, the identification of the model remains one of the crucial points of the analysis. In our case, we proceed in the following way. First, we test the stationarity of the time series. The non-stationary time series exposes the possibility of spurious regression. Unfortunately, even if you are unable to ascertain the nature of the non-stationarity, we think that it cannot be considered a proper strategy to recourse to the specification of a model in differences (solution suggested by analysts of the time series), because the long-term relationship in this model is not definite and, therefore, is not attributable to any property of the steady state formulated by economic theory. For instance, a VAR in first differences, although properly specified in terms of covariance-stationary series, will not capture the long-run tendencies.

Thus, because our time series are not stationary, we employ a Vector Error Correct Model (hereafter VECM) for the same reasons suggested by Engle and Granger. They in fact showed, with the cointegration, that if there is a long run relationship between variables a VECM is appropriated. Generally speaking, VECMs is used to model the stationary relationships between multiple time series that contain unit roots. These models are employed because many economic time series appear to be "first-difference stationary", with their levels exhibiting unit root or nonstationary behaviour. Accordingly, the VAR concept may be extended to the vector error-correction model, or VECM, where there is evidence of cointegration among two or more series. The model is fitted to the first differences of the nonstationary variables, but a lagged error-correction term is added to the relationship.

Formally, allowing for a constant term and linear time trend allow us to write the VECM, excluding

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[3]Notice that In this event, the tests of Hansen (1992a) are useful to determine whether the cointegrating relationship has been subject to a regime shift

seasonality indicator, as follows:

$$\Delta y_t = \alpha(\beta y_{t-1} + \mu + \rho t) + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-i} + \gamma + rt + \varepsilon_t \qquad (3.3)$$

where y_t is a $(Kx1)$ vector of endogenous variables, α and β are (Kxr) matrices of parameters, $\Gamma_1,\ldots,\Gamma_{p-1}$ are (KxK) matrices of parameters, γ is a $(Kx1)$ vector of parameters, r is a $(Kx1)$ vector of trend coefficients, finally μ and t denote a constant and a linear trend, respectively. In addition, Akaike's information criterion is used to choose the optimal lag associated to the VECM. Finally, the impulse response function (IRF) is also calculated.

3.3   Empirical Evidence

Regarding the sources of data utilized, they are taken from time series of Ministry of economics (Department of general state accounting).

The ADF cointegration test is implemented to estimate the existence of a long-run relationship between economic growth (GDP), total government spending (TGS) and total fiscal taxation (TFT). Our analysis interrogates not only the effect of some structural breaks, which refer to the Italian budget rules and procedures (fundamental legislative changes that occurred in the economic and financial structure of Italy during the period 1970-1990) in order to give a rational explanation to the Wagner's law (government spending, economic growth and fiscal taxation), but also capturing how public spending dynamically reacts to a positive shock related to economic growth and fiscal taxation and also vice versa.

In this regard, following Gregory and Hansen (1996), we test the cointegration relationship by including in the model described in equation (3.1) some structural breaks. The critical values of ADF test[4], based on the residuals of regression equation (3.2), are described in Fig. 3.1. The lags selected for ADF tests of C, C/T and C/S are $(2,2,2)$, as confirmed by Akaike information criterion. We also test the correlation between residuals using Lagrange Multiplier (LM) test (it confirms no correlation between residuals, but not reported here).

Using the C and C/T formulations, we find that the null hypothesis of no cointegration is not rejected in ADF test (without any break), contrarily the C formulation in ADF* test when break associated to year 1977 (Ciampi's reform) is employed (p-value equal to 0,0085).

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[4]The optimal lags of residuals in ADF test is fixed at two, confirmed by the Akaike criteria. For reasons of robustness, even LM test that estimates the autocorrelation between residuals was implemented. The results of this test, not reported, confirm that there is no autocorrelation between residuals.

	Level	Test Statistic	0.01	0.05	0,1	p-value
M1 (ADF)						
	C	-1.912	-3.572	-2.925	-2.598	0,3263
	C/T	-1.931	-4.137	-3.494	-3.176	0,6382
M2 (ADF*)						
	C	-2.607	-3.572	-2.925	-2.598	0,0916
	C/T	-2.620	-4.137	-3.494	-3.176	0,2708
M3 (ADF*)						
	C	-2.597	-3.572	-2.925	-2.598	0,0936
	C/T	-2.669	-4.137	-3.494	-3.176	0,2492
M4 (ADF*)						
	C	-1.946	-3.572	-2.925	-2.598	0,3107
	C/T	-1.968	-4.137	-3.494	-3.176	0,6188
M5 (ADF*)						
	C	-3.482	-3.572	-2.925	-2.598	0,0085
	C/T	-3.397	-4.137	-3.494	-3.176	0,0518

Note: C=constant; C/T= constant/trend; M1=model with no breaks; M2=model with 1978 break; M3=model with 1981 break; M4=model with 1988 break; M5=model with 1997 break.

Figure 3.1: Critical values associated to ADF and ADF*statistics

So, our analysis confirms that Ciampi's reform has a certain relevance in explaining the long run cointegration relationship between the variables described in equation (3.1)[5].

Turning to the Wagner's law, we proceed to estimate a VECM. Previously we have showed that 1997 is an important period in our analysis. In particular, we found that by including only this time-break there is cointegration (but not trend-stationary) between the variables of the model, i.e. a long-term relationship. We then verify how Ciampi's reform occurred in 1997 influences on Wagner's law. For robustness check, we also focus on the reverse link, i.e. how economic activity and taxation react to a positive shock in public spending. In order to explore how one variable responds to a positive shock to another ones, a VECM is employed for the reasons described in Section 3.3 The selected lags may be determined by several criteria. We opt, as done for cointegration test, for the Akaike index, the most index used in literature. We have carried out the estimation considering different number of lags. We conclude that a VECM of order 1 minimizes the Akaike index[6]. Moreover, the Lagranger Multiplier test confirms no autocorrelation between disturbances.

As seen with ADF test, the variables are cointegrated only with break of 1997 and with a constant

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[5]In order to verify the sensitive of the ADF test, we also include in the model the interest rate which captures macro-economic characteristics of the financial market and the deflator of gross domestic product (DEF), which captures the changes in prices over time. The results are also preserved with these specifications.

[6]Confirmed also by SBIC: Schwarz's Bayesian information criterion; HIQC: Hannan and Quinn information criterion; and FPR: final prediction error

considered in the model. For this reason, we estimate a VECM of order 1 only with a constant, calculating the corresponding "impulse response function" (IRF).

The IRF, which identify the dynamic response of each variable following a positive shock to another one, are calculated as follow. First, IRF are calculated on the entire sample (1951-2009). Second, given the importance of the 1997 on Wagner's law (verified by cointegration test calculated using equation 2), we have calculated the IRF separating the data sample, i.e. before 1997 (pre-reform). In a such way, we are able to capture the changes that have occurred about Ciampi's reform on the relationship between public spending, economic growth and fiscal taxation.

Starting from the entire sample, where we forecast over 10 years, in which the strengthening of the MEF (Ciampi's reform in 1997) is included in the model, we show the impulse response function (see figure 3.2).

Following the Wagner's law, the results show that the economic activity (GDP) has a strong impact on total government spending (TGS). In other words, TGS reacts positively to a positive shock in GDP (see the third quadrant in first row).

This result confirms that the Wagner's law seems to be empirically satisfied, namely economic activity imply an increase in public spending, while a positive shock of taxation imply a decreasing in GDP. Moreover, the results show that the public spending reacts negatively to a positive shock of fiscal taxation (see the third quadrant in second row).

For comparison and robustness check, we also analyze the Keynes's theory, according to which government spending affects the economic activity. The results show that economic growth slightly responds to a positive shock in government spending (see the first quadrant in third row), while decreases to a positive shock in taxation (see the first quadrant in second row) .

In order to verify whether Ciampi's reform affected the relationship between income, public spending and taxation, we consider the pre-reform period (1951-1996). From the IRF (see Fig. 3.3), we notice that public spending reacts positively to a positive shock of economic growth, even if we notice the effect of GDP on TGS slightly decreases over time (see third quadrant in first row). Indeed, with respect to the whole sample, public spending reacts negatively to a positive shock in taxation, even if with less impact (see the third quadrant in second row). In fact, we can see that TGS almost does not respond to a positive shock in TFT.

Following instead the Keynes's overview, we find that the economic growth just reacts to the impulse of public spending (see the first quadrant in third row), while it seems to decrease to a positive shock in taxation (the first quadrant in second row). In this case, it seems that the growth does not react to shocks both in public expenditure and taxation. We can conclude that Wagner's law is empirically satisfied.

Also, the results seem to perceive a certain effect of the Ciampi's reform on the relationship. This
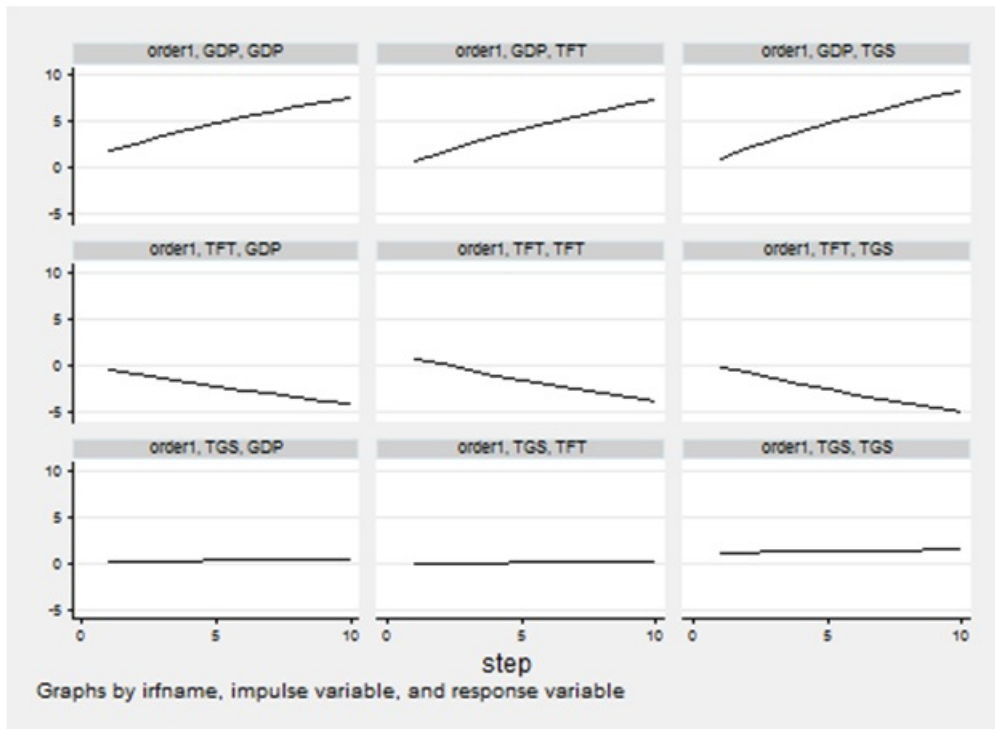
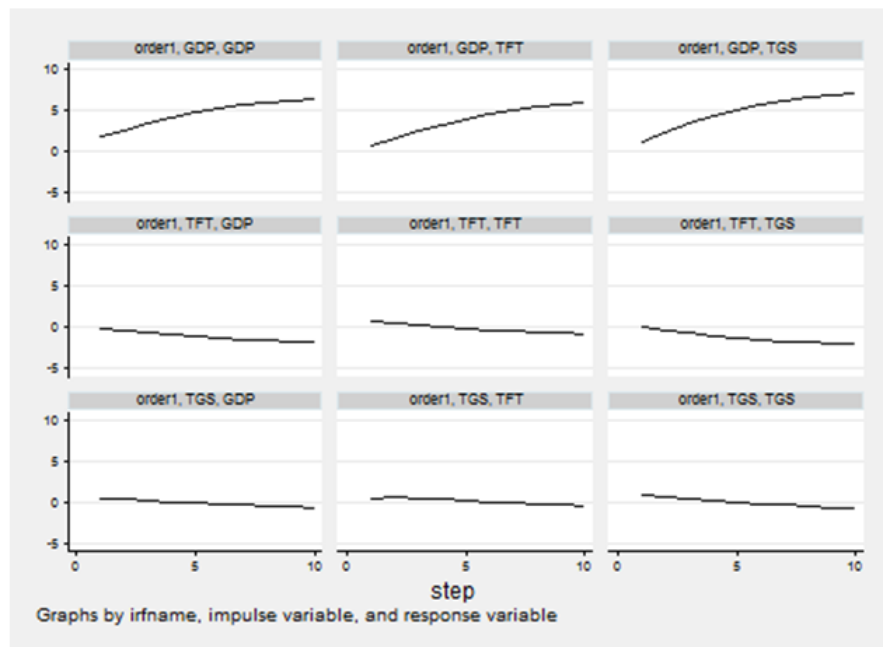Figure 3.2: Impulse response function for VECM (1951-2009)

Figure 3.3: Impulse response function for VECM (1951-1996)

reform coincides with the entry of the Euro and therefore with most controls on the finances of European countries. Comparing the results of the Wagner's law in pre and post-reform, we can see that government spending has reacted positively to positive shocks of economic activity in both cases, although there was a decreasing trend when pre-reform period is taken into account. Indeed, the effect of economic activity upon taxation is initially strong, but gradually decrease over time. This result could mean that the strengthening of the MEF has not had the desired effect in limiting public spending, causing its increase over time. In the immediately future, we will estimate the Wagner's law considering other specifications, also investigating the causality relationship. In fact, the literature shows this theory is very sensitive to different specifications, giving ambiguous results.

3.4 Concluding Remarks

In this chapter we test the Wagner's assumption pointing out the one-sided direction that goes from economic growth (GDP) to the total government spending (TGS) for Italy in the period 1951-2009. Unlike to the literature that studies this nexus, total fiscal taxation (TFT) is also included in the model. Furthermore, the analysis considers some structural breaks related to changes in the Italian budget rules and procedures. The application of the ADF test suggests that the Ciampi's reform occurred in 1997 is relevant for the long run relationship, confirming the cointegration between variables. This reform is relevant for the Italian budget rules and procedures also because coincides with the entry of the Euro and therefore with more controls on the finances of European countries. A VECM was carried out in order to capture how variables react to a positive shock of another ones. Generally, the results suggest that Wagner's law seems to be empirically satisfied, i.e. public spending positively reacts to a positive shock in economic activity, while growth decreases to a positive shock in taxation.

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