Commission on Growth and Development

WORKING PAPER NO.48

Macroeconomic Policy: Does it Matter for Growth? The Role of Volatility

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About the Series

The Commission on Growth and Development led by Nobel Laureate Mike Spence was established in April 2006 as a response to two insights. First, poverty cannot be reduced in isolation from economic growth—an observation that has been overlooked in the thinking and strategies of many practitioners. Second, there is growing awareness that knowledge about economic growth is much less definitive than commonly thought. Consequently, the Commission's mandate is to "take stock of the state of theoretical and empirical knowledge on economic growth with a view to drawing implications for policy for the current and next generation of policy makers."

To help explore the state of knowledge, the Commission invited leading academics and policy makers from developing and industrialized countries to explore and discuss economic issues it thought relevant for growth and development, including controversial ideas. Thematic papers assessed knowledge and highlighted ongoing debates in areas such as monetary and fiscal policies, climate change, and equity and growth. Additionally, 25 country case studies were commissioned to explore the dynamics of growth and change in the context of specific countries.

Working papers in this series were presented and reviewed at Commission workshops, which were held in 2007–08 in Washington, D.C., New York City, and New Haven, Connecticut. Each paper benefited from comments by workshop participants, including academics, policy makers, development practitioners, representatives of bilateral and multilateral institutions, and Commission members.

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The working paper series was produced under the general guidance of Mike Spence and Danny Leipziger, Chair and Vice Chair of the Commission, and the Commission's Secretariat, which is based in the Poverty Reduction and Economic Management Network of the World Bank. Papers in this series represent the independent view of the authors.

Abstract

Recent academic research has questioned the role of economic policy as a determinant of long-term growth rates. While there seems to be a correlation between several policy variables and growth rates, this correlation disappears when controlling for other factors. As an example, the significance of key economic policy variables such as inflation or government size disappears if we account for the quality of institutions. This paper looks at recent empirical research that questions the conclusion that macroeconomic policy does not matter for growth. By looking at the *volatility* of economic policy (whether it is fiscal policy or exchange rates), we find that policy is still a relevant and robust explanatory variable of cross-country differences in economic growth. These results have strong policy implications. Improvements in the conduct of macroeconomic policy can have beneficial growth effects even if institutional reforms are not taking place. These results do not deny the importance of institutional reforms. By setting the right institutions one can ensure the proper conduct of macroeconomic policy without having to rely on the "quality" of the decision maker.

Contents

About the Series iii
Abstract iv
1. Introduction 1
2. The Effects of Business Cycles on Growth 4
3. Do Policies Matter for Growth? 7
4. Fiscal Policy, Volatility and Growth 9
5. Conclusions 19
References 22

Macroeconomic Policy: Does it Matter for Growth? The Role of Volatility

Antonio Fatás
Ilian Mihov [1]

1. Introduction

What are the drivers of long-term growth? What are the policies that can create an environment that is conducive to growth? These are key questions that are at the center of the agendas of both policy makers and academics. Our understanding of these determinants has improved dramatically over the last two decades as academic research has focused on growth, helped by the development of what is known as endogenous growth theory. In addition, the improvement in data availability has allowed researchers to test new theories as well as the traditional growth models and produce a much broader set of stylized facts on growth and its determinants. From the perspective of policy makers, a new economic environment characterized by a dramatic shift of economic power from developed to emerging markets in an uneven way (many emerging markets have been left behind) has raised additional questions on what explains these trends and, more importantly, why some countries converge and others stagnate.

While the increasing availability of data and the focus on the empirical work has led to consensus around some stylized facts, there are still many areas where there is no agreement. The Commission on Growth and Development, for which this paper is written, is an attempt to look for progress and additional consensus and translate it into specific policy recommendations.

This paper deals with an area that is central to policy makers but one where academics have not yet reached agreement: the role of economic policy and, in particular, its volatility on growth. While the focus of the paper is on the volatility of economic policy, we briefly discuss the role of economic policy in general, as this has been a central part of most of the academic debate.

Does good economic policy matter for growth? Policy makers will answer this question with a strong yes; after all, this is what is under their influence in order to improve the economic performance of their economies. Most of the

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policy recommendations to developing countries during the decades of the 1970s, 1980s and even 1990s were indeed centered on the idea that good economic policies were instrumental to facilitate growth. Whether it was monetary, fiscal, or exchange rate policies or even price liberalization, the advice that governments from emerging markets received was to get economic policy right and then wait for their economies to grow. Many of these recipes did not work as well as expected. In some cases, due to the political costs of reforms, there was a reversal of policies. In other cases, the policies were implemented but the results were disappointing.

Partly fueled by this lack of positive results, the consensus on the determinants of growth has recently de-emphasized macroeconomic policies in favor of focusing on the role of institutions, in a broader sense, as drivers of economic performance. In addition, there is empirical evidence that calls into question the importance of economic policy. First, policy variables become insignificant in growth regressions where a large number of variables are tested as determinants of long-term performance. Second, while policies are very persistent over time, growth rates are not. And finally, there is evidence that some of the positive correlation that exists between good policies and growth is simply due to the fact that both are the result of good institutions, so once we control for the quality of institutions the correlation disappears. This is indeed one of the strongest criticisms in the academic empirical literature: bad economic policies are just the result of low-quality institutions. Trying to get these policies right without addressing their true cause cannot be successful. Using an example from Acemoglu et al. (2003), high inflation cannot be simply seen as bad monetary policy. It is the outcome of redistributional tensions in a society. Getting monetary policy right will eliminate inflation but those tensions will surface somewhere else in the form of corruption, rent-seeking behavior, or distortionary taxes.

As Easterly (2004) puts it, *"the evidence suggests that macroeconomic policies do not have a significant impact on economic development after accounting for the impact of institutions."*

In the cross-country studies of both Acemoglu et al. (2003) and Easterly (2004), once institutions are included in the regression, macroeconomic policies (inflation, the level of government spending and the overvaluation of the real exchange rate) have no predictive power for growth, output volatility, or cross-country variations in income per capita. Their conclusion is that even within a given institutional setting, different macroeconomic policies do not have a significant effect on growth.

These studies look at economic policy *in levels* and they do not test for whether the same results would hold if we were to include the volatility of those policies. This is the central thesis of this paper: that volatility of policies should be considered in the analysis.

Bringing volatility into these regressions establishes a link with a second strand of academic literature, one that looks at the relationship between volatility and growth. This is another area where policy makers and academics do not always agree. In the mind of policy makers, volatility is harmful to growth. Take, for example, the perspective of central banks. They see stabilization of inflation as a positive factor for growth but the academic literature is not supportive of this thesis.

To a large extent, the analysis of business cycles has been kept separate from the analysis of long-term growth. This was mostly due to the fact that the Solow model was the standard model to analyze growth and it assumes that long-term growth rates are exogenous. As a result, the debate on the cost of business cycles was about the welfare effects of volatility in income, and within the context of a neoclassical frictionless model these costs were very small.

After the mid-1980s, a set of empirical results showed a negative relationship between volatility and growth, a relationship that was later picked up by the theoretical development of endogenous growth models. These empirical results have been questioned because of concerns about endogeneity and the use of reduced-form specifications. In addition, endogenous growth models had difficulty in matching some key stylized facts (e.g. many of them suffered from scale effects and a simple Solow model was able to explain the dispersion of growth rates across country better than the variables suggested by endogenous growth models). One way to solve the endogeneity problem is to identify the source of volatility, one that is exogenous to growth. One of the main candidates is, of course, the volatility of economic policy: volatility of inflation rates, fiscal policy, or exchange rates. So a natural next step for this literature was to look at the growth effects of volatility in specific macroeconomic policies. And this is where the two strands of literature converge: in the analysis of the growth effects of volatility of economic policy, which is the focus of this paper.

We review some of the most recent results in this area and we conclude that policy volatility is a relevant and robust explanatory variable of cross-country differences in economic growth, regardless of how many other variables are included in the analysis. These results have strong policy implications. Improvements in the conduct of macroeconomic policy can have beneficial growth effects even if institutional reforms are not taking place. Our results do not deny the importance of institutional reforms. By setting the right institutions one can ensure the proper conduct of macroeconomic policy without having to rely on the "quality" of the decision maker.

The paper is structured as follows: the first section reviews the literature on the links between economic volatility and macroeconomic performance and welfare, with a focus on the effects on long-term growth rates. The second section reviews the literature that analyzes the role of economic policy in cross-country growth regressions. The third section analyzes in detail the evidence on the growth effects of fiscal policy volatility as an example of how to address the

open issues in both strands of literature. The last section concludes with some policy recommendations.

2. The Effects of Business Cycles on Growth

What is the relationship between business cycles and long-term growth rates? Although from a theoretical point of view both of these phenomena are driven by the same macroeconomic variables, until very recently the interaction between economic fluctuations and growth had been largely ignored in the academic literature.

From a theoretical point of view, the Solow model that assumes growth to be driven by exogenous factors was the basis for the business cycles analysis of neoclassical models. In those models, business cycles were seen as deviations around a steady state defined by the Solow model. In addition, from an empirical point of view, and from the perspective of the U.S. economy, long-term growth rates seem completely independent of business cycle conditions. Fluctuations can be characterized by recoveries that follow recessions and bring GDP levels to trend. As Jones (1995a and 1995b) has pointed out, an extrapolation of a log-linear trend for the pre-1928 period can produce extremely accurate point estimates of today's GDP levels. And for other countries the Solow model seems to fit the cross-country data quite well, as shown in Mankiw, Romer, and Weil (1992) or Barro and Sala-i-Martin (1992, 2004). In addition, early attempts to empirically validate endogenous growth models were not very successful, as argued in Easterly et al. (1993) or Jones (1995b).

Within this framework (Solow/neoclassical business cycle model) the costs of economic fluctuations can only be related to the uncertainty they generate and the resulting fluctuations in consumption. The welfare costs can be measured as the percentage of income that a representative consumer would be willing to trade in for the elimination of these fluctuations. The early work of Lucas (1987) estimated these welfare costs to be very small (below 0.1 percent of GPD). Without questioning the theoretical framework, several authors have challenged these calculations. Whether is by using a different utility function (Tallarini 2000 or Dolmas 1998) or by measuring risk at the individual rather than at the aggregate level (Krusell and Smith 2002, Imrohoroglu 1989, or Atkeson and Phelan 1994) or by introducing credit market imperfections, these authors have generated larger welfare costs of business cycles.

These welfare costs become even larger if we allow for deviations from the frictionless neoclassical model. These models are more appropriate for emerging markets, where the concerns about volatility are larger. Loayza et al. (2007) and Raddatz (2007) present ample evidence that volatility is not only high among developing countries but it is also likely associated to higher costs because it leads to more volatility of consumption than in industrial economies. Aguiar and

Gopinath (2007) model this volatility within the context of a standard neoclassical real business cycle model and argue that shocks to trend growth are the main source of fluctuations for developing countries.

When we move away from the exogenous growth model the costs of volatility can be much higher as there is the possibility that growth rates are affected by fluctuations. From a theoretical point of view, the relationship between volatility or uncertainty and growth is not an obvious one. King, Plosser, and Rebelo (1988) and Stadler (1990) noticed that within the class of endogenous growth models many types of disturbances—different from permanent shifts in the production function—can produce permanent changes in output, but this does not establishes a link between volatility and growth. In a standard neoclassical model where agents (firms) are risk neutral, investment should increase with uncertainty (at least in prices) because of the convexity of the profit function. In that environment, volatility leads to increasing investment under the assumption of risk neutrality and Aghion and Banerjee (2005) make this theoretical point within the AK model.

There are several ways of modifying the analysis so that volatility and uncertainty become detrimental to investment and long-term growth. The first is very mechanical and consists of thinking about fluctuations as asymmetric. What if more fluctuations meant deeper recessions relative to unchanged expansions? Rodrik (1991) or Delong and Summers (1988) follow this path. The link between volatility and growth could also be happening through uncertainty. Feeney (1999) argues that risk sharing (through trade) and the associated decrease in uncertainty and volatility can have positive effects on growth. An endogenous growth model can also introduce general equilibrium effects of uncertainty on growth through investment, consumer behavior, and the labor supply, as in Barlevy (2004), Jones et al. (2005), or de Hek and Roy (2001). More recently, Aghion et al. (2005) show that a key to understanding the link between volatility and growth is the level of financial development. They show both theoretically and empirically that the presence of credit constraints makes volatility costly for growth. In their model productive long-term investment is wasted when firms face a negative productivity shock in the presence of liquidity constraints. Because of the restrictive role of credit constraints on firms, investment and growth are lower in economies with higher volatility.

When we turn specifically to policy, we find few theoretical papers that discuss the link between policy volatility and growth. In addition to Rodrik (1991) discussed above, a second early example is the work of Aizenman and Marion (1993) who build an endogenous growth model with investment irreversibility. In this context they show that higher policy volatility (modeled as higher dispersion of tax rates) is detrimental for growth. Hopenhayn and Muniagurria (1996) discuss growth and welfare effects of policy volatility and persistence within a standard AK model of growth. They find that an increase in the frequency of policy changes can lower growth, but higher amplitude of

policy changes is associated with higher growth rates. The role of policy volatility can also be detected in Barro (1990), who introduces productive government spending in an endogenous growth model and shows that there is an optimal level of government spending. The optimality results from the fact that when government size is small, the benefit of increasing spending outweighs the cost of taxation. If government spending exceeds the optimal level, then the required tax rate hurts efficiency and growth slows down. Figure 1 in Barro (1990) shows that growth is a concave function of government size and it is straightforward to demonstrate in his model that an increase in spending volatility will reduce growth. Chong and Gradstein (2006) emphasize a different and in our view also a plausible mechanism: In countries where governments cannot commit to a stable tax rate, fewer firms enter into productive industries, which in turn lowers the aggregate growth rate. Using data from about 80 countries they document the negative effect of policy volatility on firms' growth rates.

The empirical evidence on the link of volatility and growth is extensive and overall there seems to be a consensus that there exists a negative relationship between volatility and growth, one that is stronger for developing countries. The earlier work in this literature looked at the direct relationship between growth and volatility; see, for example, Ramey and Ramey (1995), Kormendi and Meguire (1985), Imbs (2003), Martin and Rogers (2000), Hnatkovska and Loayza (2005), Aghion et al. (2005), and Koren and Tenreyro (2006). All of these papers document a negative relationship between overall macroeconomic volatility and economic growth. There are other papers that have found inconclusive results such as Easterly and Wetzel (1989) and Lutz (1994).

From an econometric point of view there are two concerns with the negative correlation between volatility and growth, both of them related to the fact that these are reduced-form estimations:

- Endogeneity. The correlation between volatility and growth does not establish a causal relationship between the two variables. It could simply be that both are correlated and the result of different technologies or production processes. While the concern is a valid one, it is unclear why low growth rates should be correlated with high volatility, In fact, and as Imbs (2003) has argued, it is very plausible be that the correlation is positive rather than negative and the bias goes in the opposite direction.
- Omitted variables. It can also be that both of these variables are determined by a third variable that has not been captured in the econometric specification. For example, and as argued by Acemoglu et al (2003) or Easterly (2004), it could be that policy is just the result of institutions. This is possible a stronger concern and one that we will address in the next section of the paper.

The only way to deal with both of these concerns is to move towards a more structured specification that captures the mechanism of transmission from volatility to growth and the source of volatility. Regarding the mechanism of transmission, while investment is the obvious candidate, it seems that it cannot explain the correlation between growth and volatility as discussed in Fatás (2002), a point also made by Aghion et al. (2005) to justify their modeling strategy that uses total factor productivity (TFP) as the mechanism of transmission.

When it comes to specifying the source of uncertainty, economic policy is an obvious candidate. The view that policy volatility is key for long-term economic performance is certainly not new: in his Nobel laureate lecture, Friedman (1977) points out that while high inflation *per se* does not change the natural rate of unemployment, an increase in the variance of inflation can generate grave economic inefficiencies and affect the long-term performance of the country by raising its natural rate of unemployment. Thus long-term monetary neutrality holds in the level of policy but not in its second moment. Alesina et al. (1996) and Dutt and Mitra (2008) study the effects of political instability on macroeconomic outcomes, including growth, while Judson and Orphanides (1999) analyze the effects of the volatility of inflation. The latter paper finds that in panel OLS regressions the volatility of inflation has a significant and negative effect on growth.

By providing a specific channel through which volatility matters for growth these papers provide stronger supporting evidence of the relationship between volatility and growth. However, there is still the open question of whether these variables are truly exogenous. This will be the focus of the next section.

3. Do Policies Matter for Growth?

In this section we address the question on whether the empirical negative correlation between volatility and growth can be seen as a causal relationship or is simply caused by a third variable that affects both of them. This is, of course, part of the general debate on what are the main determinants of long-term growth rates and it is normally resolved by including all possible variables in a cross-country regression and then seeing which ones are more robust to different specifications. Recently, a set of researchers have followed an agnostic approach to this question by including as many potential explanations as possible and then see which of them are consistently superior in the econometric specifications. For example Levine and Renelt (1992) find that only initial level of GDP per capita, investment, openness, and human capital are robust determinants of growth. Fiscal policy variables (all of them measured in levels) or, more generally, policy variables, are not significant. Similarly, and using a very different methodology Sala-i-Martin, Doppelhofer, and Miller (2004) find that policy variables are not robust in their analysis.

These results are in contrast with the priors of policy makers and also with some of the previous results in the literature, which attach a strong role to economic policy in the determination of growth rates. A potential explanation of why policies do not seem to matter in those regressions is provided by Acemoglu et al. (2003) and Easterly (2004). Their argument is that policies are simply the outcome of institutions. Once we control for them, their effect disappears. "The main determinant of differences in prosperity across countries is differences in economic institutions" (Acemoglu and Robinson 2008). In earlier work, Acemoglu et al. (2003) go even further and claim that policies are not even mediating factors in the relationship between growth and institutions. This result comes from a reduced-form specification where growth rates are regressed on both institutions and policies and the coefficient on policies is not significant.

The conclusions of these papers are controversial. There are several concerns with the methodology used in their specification and the exogeneity of some of the institutional variables. The concern that is of interest to this paper is the absence of any measure of policy volatility in their analysis. In all those papers policy is measured *in levels*. For example, fiscal policy is defined as government size (e.g. expenditures as a percent of GDP) or tax rates. Exchange rate policy is measured as the distortions in the official market for exchange rates. While these are important policy variables, the analysis ignores the role of volatility and uncertainty in policy. From a theoretical point of view it is unclear which one should matter more, the level or the volatility of policy. But given that this is an empirical exercise, it is important to allow for the effects of policy volatility, given all the positive results cited in section 2 that showed a negative correlation between volatility and growth.

How do we measure policy volatility? If we restrict ourselves to macroeconomic policy, there are three dimensions to be considered: fiscal policy, domestic monetary policy (inflation, interest rates), and exchange rate policy. One can also go one step further and look at political changes that are likely to lead to changes in actual policy as in Alesina et al. (1996) and Dutt and Mitra (2008).

The difficulty of looking at domestic monetary policy is that it is not easy to define the instruments of monetary policy. Interest rates are the obvious choice but short-term interest rates are not available for many countries and even when they are available, the series do not have consistent definitions across countries. In addition, the interest rate is properly labeled as a monetary policy instrument only in few countries. One solution is to look at outcomes of monetary policy (e.g. inflation) as in Judson and Orphanides (1999) but then we face serious endogeneity problems.

When we look at exchange rates, the first question is whether exchange rates can be considered a policy variable as in most cases they are determined by markets, influenced by other variables such as productivity and, at most, they can be considered the outcome of monetary policy decisions that are captured

better by other variables. But governments do make decisions on exchange rate management that have an influence on the volatility of the exchange rate and in that sense, their volatility can be considered as a policy variable (Eichengreen (2008) provides a thorough discussion on this issue). Aghion et al. (2006) look in detail at the consequences of exchange rate volatility on growth rates both from a theoretical and empirical point of view.

The third potential policy dimension is fiscal policy. Fiscal policy has several advantages over the previous two:

- Mapping fiscal policy variables into policy instruments is straightforward. Taxes or government spending are much better defined as policy variables than interest rates or exchange rates.
- There is much more consistency in measurement of fiscal policy variables across countries or time.
- There is a long literature on the determinants of fiscal policy that could be a potential source of instruments to deal with the endogeneity problems of the cross-country regressions.

The next section of the paper presents a detailed analysis of the connection between fiscal policy volatility and growth. It addresses the concerns of the literature on volatility and growth by identifying the source of volatility and using instrumental variables. It also deals with the criticism of the second strand of literature (exemplified by the work of Acemoglu et al. 2003) by showing that the correlation between policy volatility and growth is robust to the inclusion of institutional variables in the regressions.

4. Fiscal Policy, Volatility, and Growth

As argued in the previous section, fiscal policy is a natural candidate to test our hypothesis and establish a link between macroeconomic policy and growth. In this section we look at the effects of fiscal policy volatility on growth and we assess whether the relationship is robust to the inclusion of additional macroeconomic and institutional variables.[2]

Characterizing Fiscal Policy (Volatility)

While it is straightforward to think about budgetary outcomes as a characterization of fiscal policy, there is still an open question about how to summarize fiscal policy actions with one single variable. It is common to use the budget balance as an indicator of the fiscal policy stance but, in most macroeconomic models, it is not just the balance that matters but also its

[2] In this section we follow closely the analysis of Fatás and Mihov (2006). Sources and additional results can be found in the original paper.

composition (expenditures, revenues). And once we pick one of these budgetary variables as the indicator of fiscal policy we still need to worry about the fact that fiscal policy variables react endogenously to economic outcomes and, therefore, measuring their changes will not be an appropriate indicator of policy volatility.

It is useful to think about these issues in the context of fiscal policy rules. We can summarize a fiscal policy rule by the following relationship:

$$\textit{Fiscal Policy}_t = \alpha + \beta\, \textit{Economic Activity}_{i,t} + \varepsilon_t$$

where *"Fiscal Policy"* can be the overall balance or one of its components and *"Economic Activity"* is a measure of the cyclical stance of the economy (such as the output gap or output growth.

We normally think about the parameter β as automatic stabilizers but in practice it is a combination of automatic stabilizers and the discretionary response of governments to economic fluctuations. Separating both of these components is only possible if we have accurate information on the automatic stabilizers (i.e. if we have precise information of elasticities of all budget components; this is the methodology proposed by Blanchard and Perotti (2002)). If this is not possible, then we can ignore this difference by focusing on the residual of the equation above, which can be interpreted as the exogenous discretionary changes in fiscal policy. By exogenous we mean changes that are not related to the cyclical position of the economy. One can think of these changes as political decisions by governments to change fiscal policy for reasons other than influencing the state of the economy. (Drazen 2000 and Persson and Tabellini 2000 discuss various models within the political business cycle literature, in which politicians have incentives to change spending levels for reasons other than macroeconomic stabilization.) While this residual only captures some of the fiscal policy actions, it is a better candidate to address the problems of endogeneity that are likely to appear in the econometric analysis. By looking at only a subset of the fiscal policy actions, we are subjecting the theories to a stricter test. In other words, by looking at "noise from a regression" we might not expect to get any significant and robust results out of the econometric analysis.

In a recent paper, Aghion and Marinescu (2007) use an alternative measure of budgetary activism based on the cyclicality of government debt (the parameter β). Their study is focused on understanding the growth effects of countercyclical fiscal policy, while what we pursue here is to extract the component that is not related in any way to the stage of the business cycle.

A remaining question in the equation above is what variable to use as a measure of fiscal policy. Fiscal policy will be captured by government consumption. While this is, once again, only a partial view of fiscal policy, ignoring taxes or transfers, it has the advantage that is consistently measured

across countries (see Fatás and Mihov 2003 for a discussion on different ways of measuring the fiscal policy stance).

In practice, we use a sample of 95 countries over the 1970–2000 period and for each of them we run a regression of the type

$$\log(G)_{i,t} = \alpha_i + \beta_i \Delta\log(y_{i,t}) + \gamma_i \log(G)_{i,t-1} + \delta_i Z_{i,t} + \varepsilon_{i,t}$$

Where G is government consumption and $\Delta\log(y)$ is the growth rate of output. We include controls (Z) and we will think of σ^{ε}_i (which is measured as the standard deviation of the residual) as our measure of policy volatility.

The equation is estimated by instrumental variables because of the possible reverse causality from government spending to output. As instruments we use a time trend, logarithm of oil prices, and a lag of the GDP deflator.

Is This a True Measure of Policy Volatility?

We claim that σ^{ε}_i from the regression above captures well fiscal policy changes due to politically motivated actions. One way to verify that this is the case, that our measure is not just noise, is to regress it on a set of political economy variables to see if the results are what we expect. These results will later be used as instrumental variables in the analysis.

The main institutional variable that we consider is *Constraints on the executive*. We have chosen this variable because a version of this institutional characteristic is used in the previous literature (e.g. Acemoglu et al. 2003) and also because it shows how much freedom the executive has in changing policy stance. The particular variable that we use takes five values depending on how many checks on the executive exist. It is calculated as:

$$\text{Constraints} = \text{Legislature} + \text{Upper chamber} + \text{Judiciary} + \text{Federal}$$

Each of the variables on the right-hand side is a dummy variable that takes the value of 1 for countries that have the specific institutions: *Legislature* is equal to 1 for countries where the parliament is freely elected and independent of the executive; *Upper chamber* is 1 if the country has a bicameral legislature; *Judiciary* equals 1 for countries where the judiciary is separated from the executive branch; *Federal* equals 1 for countries with a federal structure so that the political power is shared between the central and local governments.

Thus the variable *Constraints* captures potential veto points on the decisions of the executive. The raw data used to construct *Constraints on the executive* comes from Henisz (2000).

Table 1: Institutions and Policy Volatility
Dependent variable: fiscal policy volatility

	Univariate	Baseline
Constraints on the executive	−0.794	−0.505
	(0.110)***	(0.116)***
Presidential		1.624
		(0.311)***
Majoritarian		−0.246
		(0.233)
Elections		−3.839
		(1.123)***
Constant	0.216	0.132
	(0.181)	(0.375)
Observations	87	86
R-squared	0.37	0.57

Source: Fatás and Mihov (2006).
Notes: Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%

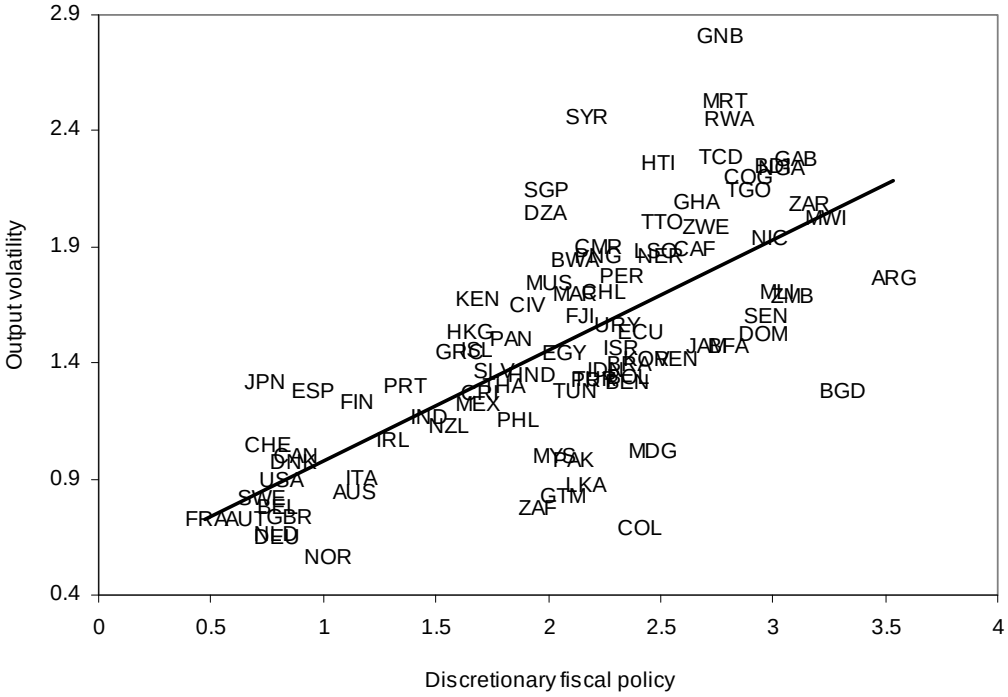
A regression of fiscal policy volatility (σ^{ε}_{i}) on this measure of constraints shows that there is a significant negative effect on policy volatility (see Table 1). Alone, this institutional characteristic explains 37 percent of the cross-country variation in policy instability. This is a very strong result that has a straightforward interpretation—countries with more checks and balances do not allow the executive to change policy for reasons unrelated to the state of the economy. Therefore in these countries overall policy volatility is lower.

The introduction of other political and institutional variables leads to even stronger results. Such variables include (i) political system (presidential vs. parliamentary), (ii) electoral system (majoritarian vs. proportional), and (iii) number of elections. These variables improve the fit of the regression by raising the R^2 to 57 percent. Given that these variables (with the possible exception of the last one) are exogenous to the current state of the economy, they will be used later as instruments for policy volatility.

Does Policy Volatility Lead to Output Volatility?

Now that we know that the measure of policy volatility is indeed related to political economy variables (as expected), we can see if excessive discretion in fiscal policy leads to a more volatile economy. The answer appears in Figure 1.

Figure 1: Fiscal Policy Volatility and Output Volatility



Source: Fatás and Mihov (2003).

We see a strong correlation between discretionary fiscal policy (measured by σ^{ε}_{i}) and the volatility of output growth. We can measure the economic effects of an increase in fiscal policy volatility by using the following example (from Fatás and Mihov 2003): If Portugal brings down its policy volatility (3.9 percent) to that of Spain (2.6 percent), which is a 33 percent reduction in the standard deviation of the residual volatility, then it will see its output volatility go down by 26 percent from 2.65 percent to slightly less than 2 percent. These are large effects and they confirm that fiscal policy is an important source of cross-country differences in the volatility of output. There is, of course, a potential problem with the direction of causation, but the use of instrumental variables confirms that the relationship is robust and goes from fiscal policy to output volatility. We discuss the use of instrumental variables in detail in the next section.

Does Policy Volatility Affect Growth Rates?

Now that we have seen that our measure of fiscal policy volatility has a clear effect on macroeconomic performance measured as the volatility of business cycle, we investigate whether this is also translated into differences in growth rates. As discussed before, if policy has an impact on growth and not just volatility, the welfare effects are likely to be much bigger (Barlevy 2004).

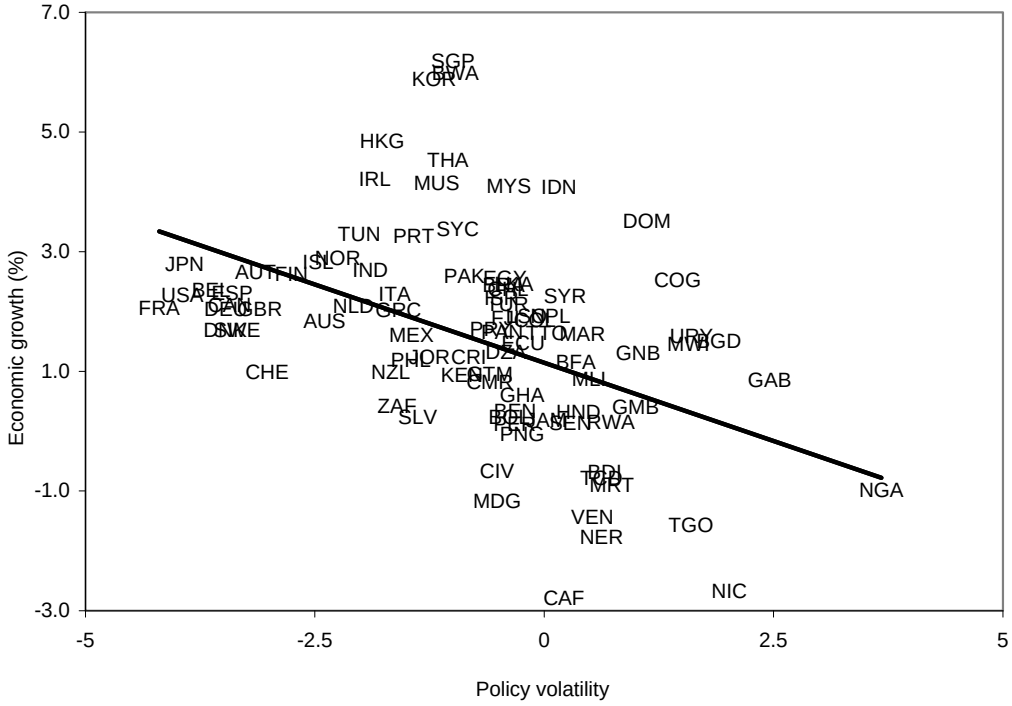
It is interesting to notice that the most volatile fiscal policy is recorded in several African and Latin American countries, whereas the most stable policies

are those in the OECD economies, already an indication that there might be some negative growth effects of volatility.

The unconditional raw correlation between growth and policy volatility is negative and a regression of growth on policy volatility yields a negative coefficient that is significant at the 1 percent level of significance (see Figure 2 for a scatter plot; results are displayed in Table 2). From an economic point of view, the size of the coefficient suggests that a country like Brazil—with volatility of fiscal policy being at the mean of the sample—could raise its growth rate by about 0.5 percent per year if its fiscal policy were stabilized to the same level as Mexico. These are very large effects and confirm that discretion in fiscal policy leads to not only more volatility in output but also lower growth rates.

One interesting question is whether the result holds for different samples, in particular if we look at rich and poor countries. In the last two columns of Table 2 we split the sample into rich and poor countries where rich countries are defined as average GDP per capita in 1967–69 of at least $4,500, which is the mean income in those years. In the poor countries policy volatility has a bigger impact on long-term growth than in the rich subsample.

Figure 2: Fiscal Policy Volatility and Economic Growth



Source: Fatás and Mihov (2006).

Table 2: Average Growth and Policy Volatility

Dependent variable: growth rate of output per capita 1970–2000

	Univariate	Baseline	Extended	Rich	Poor
Policy volatility	−0.523	−0.662	−0.673	−0.660	−0.892
	(0.099)***	(0.152)***	(0.162)***	(0.172)***	(0.260)***
government size		−0.030	−0.031	−0.007	−0.035
		(0.015)**	(0.015)**	(0.019)	(0.016)**
Investment price		−0.012	−0.013	0.002	−0.014
		(0.006)**	(0.006)**	(0.005)	(0.006)**
Initial GDPpc		−1.211	−1.206	−2.543	−1.401
		(0.293)***	(0.297)***	(0.523)***	(0.409)***
Primary enrolment		3.111	3.126	6.943	2.657
		(0.725)***	(0.728)***	(2.863)**	(0.802)***
Openness		0.013	0.013	0.015	0.012
		(0.004)***	(0.004)***	(0.004)***	(0.006)**
Output volatility			0.068		
			−0.356		
Constant	1.146	9.178	9.535	16.348	11.036
	(0.203)***	(1.983)***	(2.123)***	(4.230)***	(2.858)***
Observations	93	90	90	30	60
R-squared	0.2	0.55	0.55	0.64	0.57

Source: Fatás and Mihov (2006).

Notes: Robust standard errors in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

There are, however, several reasons why we should interpret the scatter plot and the simple regression results with caution. First, it might be that our measure of fiscal policy discretion is simply capturing the volatility of output (due to a misspecification of the regression used to measure it). A straightforward way to test this claim is to include output volatility as a regressor (see column (3) in Table 2). This modification has no effect on the coefficient or significance of the policy volatility variable. This suggests that our measure of policy volatility is not simply a proxy for the volatility of output.

There are two other concerns that are more fundamental. First, it is possible that our measure of policy volatility is correlated with some other key determinant of economic. Second, it is possible that policy volatility does depend on recent growth performance and is therefore endogenous to long-term economic growth. These are two of the criticisms that we have discussed before in section 2 of the paper and we deal with each of them in detail below.

We need to note that the above results are very similar to those found in Aghion et al. (2006) using the exchange rate as a measure of volatility. In their paper exchange rate volatility is shown to affect negatively the growth rate of

output. In addition, the effect is also stronger for poor countries and countries with low level of financial development.

Is This Result Robust to Adding Other Determinants to Economic Growth?

As mentioned in earlier sections of the paper, cross-country analysis of the determinants of growth have generally rejected the role of policy variables, as other variables seemed to account better for the partial correlation of Figure 2. Once we conditioned for those variables, the coefficient of growth on policy became insignificant. But these papers ignored the role of policy *volatility*. What if we run a race between policy volatility and some of the most robust variables in that literature?

In column (2) we include five key determinants of growth as determined by Sala-i-Martin et al. (2004): investment price in 1960, government size, initial GDP per capita, primary enrolment, and openness. The coefficient on our key variable of interest—policy volatility—slightly increases in absolute value and remains significant at the 1 percent level. We interpret this result as a proof that while the level of economic policy did not seem to survive this test, policy volatility proves to be an important determinant of economic growth, one that cannot be captured by the other explanatory variables.

Can We Establish a Causal Relationship?

This is the most challenging issue faced by the literature that looks at the relationship between volatility and growth. Both of them are determined by the technology used in an economy and it is plausible that different technologies correlate across these two dimensions (see Imbs 2003). In our analysis, the fact that we are not simply looking at output volatility but fiscal policy volatility is already providing some reassurance, because we are looking at the effect of policy-induced volatility and not simply output volatility. In a regression of growth on both of these variables, only the coefficient on policy-induced volatility is significant; this fact is an even stronger signal that we are not simply capturing a correlation between the average growth and the volatility of output.

In addition, we can also use the previous analysis about the political economy determinants of fiscal policy volatility as a source of instrumental variables. In fact, if the political economy variables mentioned above (constraints on the executive, number of elections, political and electoral system) are used as instrumental variables, the regression reveals again a strong negative impact of policy volatility on growth. Results are summarized in Table 3. While it is always difficult to eliminate all endogeneity concerns in cross-country growth regressions, the combination of these two results is a good robustness test of the negative effect of policy volatility on growth.

Table 3: Average Growth and Policy Volatility: Instrumental Variables Estimation

Dependent variable: growth rate of output per capita 1970–2000

	Univariate	Baseline	Extended
Policy volatility	−0.659	−1.072	−1.267
	(0.149)***	(0.319)***	(0.459)***
Government size		−0.032	−0.036
		(0.020)	(0.022)
Investment price		−0.009	−0.009
		(0.007)	(0.007)
Initial GDPpc		−1.687	−1.718
		(0.453)***	(0.463)***
Primary enrolment		3.291	3.276
		(0.800)***	(0.855)***
Openness		0.016	0.015
		(0.005)***	(0.005)***
Output volatility			0.693
			(0.779)
Constant	0.998	12.172	11.351
	(0.228)***	(3.075)***	(2.774)***
Observations	86	84	84
OID Test	0.029	0.182	0.245

Source: Fatás and Mihov (2006).

Notes: Robust standard errors in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Is Policy Independent from Institutions?

We have already shown that the correlation between growth and policy volatility is robust to the introduction of other variables, but what about institutions? This is an important question for our analysis as we have argued earlier that policy volatility is indeed determined by institutions. Could it be, as Easterly (2004) and Acemoglu et al. (2003) argue, that policies do not matter at all, that they are simply a reflection of the quality of institutions and that from a policy point of view the only way forward is through institutional reform?

From an econometric point of view we want to ask the following questions: (i) Do institutions have any additional explanatory power for economic growth above the effect they have through policy volatility? (ii) Does policy volatility have a direct effect on growth when we control for institutions? Or, in different words, within the same institutional setup, do we observe any effect of policy volatility on growth?

Table 4: Average Growth, Policy Volatility and Political Constraints

Dependent variable: growth rate of output per capita 1970–2000

	Univariate (OLS)	Baseline (OLS)	Baseline (IV)
Constraints	0.336	−0.040	−0.590
	(0.140)**	(0.194)	(1.027)
Policy volatility		−0.684	−1.088
		(0.162)***	(0.273)***
Government size		−0.032	−0.048
		(0.018)*	(0.020)**
Investment price		−0.011	−0.005
		(0.007)*	(0.009)
Initial GDPpc		−1.213	−1.101
		(0.325)***	(0.826)
Primary enrolment		3.283	4.120
		(0.800)***	(1.309)***
Openness		0.013	0.012
		(0.005)***	(0.008)
Constant	1.061	9.035	7.800
	(0.309)***	(2.295)***	(5.840)
Observations	87	85	54
R-squared	0.05	0.53	
OID Test			0.319

Source: Fatás and Mihov (2006).

Notes: Robust standard errors in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Using the methodology of Acemoglu et al. (2003) we add a measure of the quality of institutions to our regressions and see what happens to the significance of both coefficients. We will use the constraints on the executive as the main indicator of the quality of institutions (see Fatás and Mihov 2006 for additional results using alternative measures). Results are displayed in Table 4.

If we look at the role of constraints on the executive, the univariate regression of output growth rates from 1970 to 2000 on constraints on the executive in 1969 shows a significant positive correlation. A causal interpretation of this result suggests that countries with more constraints on the executive achieve faster economic growth. But what is the channel? As we have shown in our main tables, one explanation is that political constraints lead to more stable policy, which in turn creates more favorable environment for growth. In our regressions, when both variables are included (policy volatility and constraints) we discover that these constraints do not have any marginal power in explaining growth above and beyond their effect on policy stability. Importantly the coefficient on policy volatility is almost identical to the previous estimates

without the inclusion of the constraints variable. This result is very different from what Acemoglu et al. (2003) find using policy in levels. In their analysis, the introduction of institutional variables made the significance of the coefficient on policies vanish. These results are robust to the use of instrumental variables to take into account the potential endogeneity of either the policy volatility variable or the institutions variable.

One way to think about these results is to think about the marginal effect of policy volatility once we keep the institutional setting constant. In other words: within a certain institutional framework, does it pay to improve policies? The answer is yes: even within similar institutional frameworks in terms of veto points, policy volatility matters.

Policy Reform: Panel Estimation

A final robustness check on the results is to study the effects of policy changes on economic growth over time. Ideally, one would like to see how shifts in policy volatility affect growth *within* a country. Despite the difficulties in addressing the time-variation in our data series, we have attempted to provide at least a partial view of the robustness of our results using within-country variation.

We create a panel of 10-year averaged data that produces four non-overlapping periods starting in 1965. The first three periods each cover 10 years of data, while the fourth uses the last 6 years in our data set. For each decade of growth we use as initial conditions data on income per capita, primary education, investment price, government size, and openness. These initial conditions are calculated as averages for the three years preceding the relevant decade. For example, when growth covers the 1985–94 period, the initial conditions are calculated as the average from 1982 to 1984. The coefficient on policy volatility is again negative, highly significant, and almost identical to our cross-sectional estimate. See Table 5 for the results.

To sum up the panel estimation, we note that the negative impact of higher policy volatility on growth is confirmed in a wide variation of specifications. Even within countries, governments that conduct unstable fiscal policy create an environment that harms the subsequent growth performance of the country.

5. Conclusions

Do macroeconomic policies matter for economic growth? While policy makers have responded with a strong, clear 'yes' to this question, academics so far have produced mixed evidence about the impact of macroeconomic policies on growth. The skeptics use empirical results to show that:

Table 5: Panel Estimation, Pooled OLS

Dependent variable: growth rate of output per capita by decades: (1965–74, 1975–84, 1985–94, 1995–2000)

	Univariate	Baseline
Policy volatility	−0.536	−0.669
	(0.069)***	(0.106)***
Government size		−0.054
		(0.016)***
Investment price		−0.009
		(0.004)**
Initial GDPpc		−0.901
		(0.270)***
Primary schooling		1.778
		(0.766)**
Openness		0.012
		(0.003)***
Constant	−1.329	5.315
	(0.437)***	(1.737)***
Observations	368	314
R-squared	0.13	0.26

Source: Fatás and Mihov (2006).

Notes: Robust standard errors in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

- While growth rates are fairly persistent over time, policies are not.
- In standard cross-country growth regressions, macroeconomic policies become insignificant when other variables are introduced.
- Related to the previous point, policies are simply the result of institutions. Once we control for institutional quality, macroeconomic policies do not matter. Any attempt to improve the growth performance requires institutional reform. Improving macroeconomic policies will not have a significant effect on growth without reform.

In this paper we argue that these criticisms have overlooked the possibility that *policy volatility* is an independent and strong determinant of economic growth. Looking at the relevance of volatility is not new; there is a long tradition, especially among emerging markets, of studying the effects of volatility on growth.

In particular, we have looked at how the volatility of fiscal policy fits into this debate. By looking at the growth effects of *volatility induced by fiscal policy* we are able to address the endogeneity concerns of the volatility and growth literature. By showing that this policy variable is a determinant of growth rates

in a cross-country regression and that the result is robust to many specifications and the introduction of other controls and variables, including measures of institutional quality, we are showing that macroeconomic policy matters for growth.

Our results have strong policy implications. Recent academic research has pushed policy makers to focus on institutional reform. This has turned out to be less productive than anticipated because of the inherent difficulties in reforming institutions. While the advice was sound, progress was limited.

The results reviewed in this paper do not deny the importance of institutions; in fact we show that they are strong determinants of economic policy. But we show that even without institutional reform, there is room for increasing growth rates through good economic policies. Among the different dimensions of economic policy we have focused on volatility, and its potential effects on the business cycle. Volatility is a recurrent theme for emerging markets and our results suggest that the potential gains of getting economic policy right for those countries are much larger.

Most of the results reviewed in this paper are about fiscal policy and in particular about the discretion that governments have and exercise regarding changes in fiscal policy that are not related to the business cycle. There is a strong message that the more discretion governments have, the more they will exercise it and it will cause unnecessary volatility and lower growth.

There are many areas of interest that remain open to future research: Are the results true for other dimensions of monetary policy? How can we design institutions that ensure the implementation of good economic policies without having to rely on the "quality" or judgment of the decision maker? These are questions to be answered by future research. The results discussed in this paper support the need to continue with this research agenda and do not lose sight of the importance of economic policies when it comes to growth and development.

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Recent academic research has questioned the role of economic policy as a determinant of long-term growth rates. While there seems to be a correlation between several policy variables and growth rates, this correlation disappears when controlling for other factors. As an example, the significance of key economic policy variables such as inflation or government size disappears if we account for the quality of institutions. This paper looks at recent empirical research that questions the conclusion that macroeconomic policy does not matter for growth. By looking at the *volatility* of economic policy (whether it is fiscal policy or exchange rates), we find that policy is still a relevant and robust explanatory variable of cross-country differences in economic growth. These results have strong policy implications. Improvements in the conduct of macroeconomic policy can have beneficial growth effects even if institutional reforms are not taking place. These results do not deny the importance of institutional reforms. By setting the right institutions one can ensure the proper conduct of macroeconomic policy without having to rely on the "quality" of the decision maker.

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