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Fiscal Policy in Latin America

1. Introduction

Macroeconomic analysis of Latin America has long been primarily an exercise in monetary analysis. Fiscal policy has always formed part of this study, but the emphasis has typically been on fiscal deficits only, with the interest primarily centered on their effect on monetary outcomes and inflation. This emphasis is understandable, in light of the region's history of monetary and financial instability, but the time may be ripe for a change. While inflation has not vanished from Latin America, over the course of the past decade it has fallen nearly to single-digit levels. There is good reason to hope that Latin America will no longer be a breeding ground for the extreme and exotic monetary experiments that have in the past occupied monetary economists around the world. If so, policymakers in the region will have scope to turn their attention to other policy problems, and students of economic policy will have to search elsewhere for lessons.

We think that fiscal policy is one area that ought to be high on the agenda for both policymakers and researchers. In our view, Latin American fiscal policy has been under-studied, perhaps with adverse implications for policy, and certainly with lost opportunities to confront theories,

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such as the idea that the tax-smoothing model is a useful positive as well as normative model of fiscal policy, against an illuminating body of historical experience.

One reason for this lack of attention to many dimensions of fiscal policy in the region is the difficulties that confront researchers attempting to obtain data on fiscal outcomes. The standard data source is the International Monetary Fund's Government Finance Statistics, whose coverage of Latin America is, however, largely limited to central governments, and even there has important gaps. The coverage of local governments is spotty, and provides only a limited breakdown of different budgetary aggregates. This poses a serious limitation for cross-country comparative work, particularly work involving important federal countries such as Argentina and Brazil. The publication was never intended to cover public-enterprise finance, which is, again, an important limitation in a region where public enterprises have long been a central element of the fiscal picture. Thus, one contribution of this paper is the creation of a comprehensive database on fiscal outcomes in 13 major Latin American economies, which covers central government, local governments, and nonfinancial public enterprises at a reasonably detailed level of aggregation.

Armed with this database, our purpose in this paper is to lay out some basic facts about fiscal outcomes in Latin America. We think that the basic characteristics of fiscal policymaking in the region are sufficiently unfamiliar that a straightforward and transparent examination of the data, not excessively colored by a particular model structure, is called for at this point. Of course, the predictions of the large body of theoretical literature on fiscal policy—although mainly developed with industrial-country experience in mind—have determined the questions that we ask of the data. And some form of benchmark is required to make meaningful statements about the data. But rather than confront the data with the orthogonality conditions implied by a specific theoretical model, we have used the industrial-country experience as our standard of comparison. Nobody would argue that fiscal policy is determined optimally in the industrial countries, but their experience has the advantage of having been intensively studied and in many cases rationalized theoretically. When we identify sharp differences between Latin American and industrial-country patterns, we hope to learn not only about Latin America, but also about the generality of theories that seek to explain industrial-country experience.

We do in fact find stark, qualitative differences between Latin American and industrial-country fiscal outcomes. Fiscal outcomes have been far more volatile in Latin America than in the industrial economies. And,

in sharp contrast to the industrial economies, fiscal policy has been procyclical, and particularly so in recessions, casting doubt on the applicability of the Barro (1979) tax-smoothing hypothesis for Latin America. We then turn to an analysis of the relationship between fiscal policy and the exchange-rate regime. Contrary to much—though by no means all—conventional wisdom, we find no evidence that fixed-exchange-rate regimes impose greater fiscal discipline, and some evidence that the reverse may be true. We also find that fiscal shocks have been more disruptive than is typically observed in the industrial economies, uncovering evidence that in Latin America expansionary fiscal expansions have been significantly associated with exchange-rate collapses.

Some of these differences seem to us difficult to rationalize with existing theoretical frameworks for optimal fiscal policy. We think that this should concern policymakers in the region, and motivate them to understand better why fiscal policymaking seems to have fallen short of its potential. And we think that the Latin American experience should interest students of fiscal policy in the industrial economies, providing as it does a range of experience against which to evaluate existing theoretical frameworks.

The paper is organized as follows. In the following section we describe the database of fiscal outcomes that we use in this study, including certain methodological issues associated with its development. In Section 3 we give a brief overview of fiscal structures in Latin America, covering the size and composition of the typical Latin American budget, and the role of local government and nonfinancial public enterprises. In Section 4 we analyze the cyclical properties of Latin American fiscal outcomes. Section 5 studies linkages between exchange-rate regimes, fiscal outcomes, and macroeconomic stability, and Section 6 concludes.

2. The Database and Methodological Issues

Our database on public finance in Latin America includes 13 countries,¹ covering a maximum period spanning 1968 to 1995. In this section, we offer a brief description of the main features of this dataset and of some methodological issues involved in its construction.² In so doing, we also briefly touch on some important institutional characteristics of fiscal policy in Latin America, which are essential for an understanding of its behavior in the past 25 years.

1. The countries are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panamá, Paraguay, Perú, Uruguay, and Venezuela.

2. A more complete description of the database, its sources, and methodology can be found in Perotti (1997).

2.1 COVERAGE OF SECTORS

The database includes not only the central government, but also the sum of state, provincial, and municipal governments (henceforth, local governments) and the nonfinancial public enterprises.

In several countries, local governments have access to a large share of total taxes, either directly or through revenue-sharing agreements, and perform important functions on the expenditure side (see Table 4, below, for information on the size and composition of expenditure and revenues of local governments in both Latin America and industrialized countries). Obviously, a cross-section study of fiscal policy could give a misleading picture if it did not include local governments as well. But there are important reasons why local governments are important even in studying the time-series aspects of fiscal policy in Latin America. Revenue-sharing agreements and the formal allocation of revenues and functions to different levels of governments have shifted over time, distorting the meaning of data at the central government level. For instance, in 1985 the revenue-sharing agreement between the central government and the provinces broke down in Argentina, causing many taxes that were previously classified as provincial taxes to be reclassified as central government taxes. As a consequence, the recorded revenues of the central government increased suddenly by about 3% of GDP; but this was obviously offset by a similar increase in transfers to the provinces. A study that utilized central-government data alone might reach quite misleading conclusions about fiscal developments in that year.

One of our key findings is that fiscal policy in Latin America has been procyclical, and therefore economically destabilizing, while the opposite holds in industrialized economies. Since local governments typically have a much more limited ability to conduct a countercyclical fiscal policy, the size and behavior of local governments in the two regions might be an important factor underlying this result. With our database, we are able to assess—and reject—this explanation for our findings.

Finally, the claim is often heard that local governments are among the key reasons behind many episodes of runaway fiscal policy, as local governments under political pressure initiate highly expansionary policies with the knowledge that the central government will foot the bill later. The bailout process might take several forms, such as an increase in the share of provinces in taxation in formal revenue-sharing agreements, or an increase in unconditional grants, or the assumption by the central government of arrears incurred by local governments, as in Brazil. These policy issues are becoming increasingly germane as governments in the region devolve authority to local governments, including in

many cases the authority to borrow domestically and internationally. To assess the relevance of the dangers that might be posed by this devolution, one clearly needs data on the role of local governments.

In virtually all Latin American countries, there is also an extensive network of nonfinancial public enterprises (henceforth, NFPEs) that have often been key players in the region's fiscal drama.³ (Table 6, below, presents the main summary statistics on NFPEs.) NFPEs often are the single largest source of revenues to the government, not only tax revenues—in which case they would not be different from other enterprises—but also nontax revenues through profit transfers. On the other hand, money-losing public enterprises are often recipients of large current or capital transfers from the government. Because many public enterprises—and in general the largest ones—operate in the key export sectors, such as oil in Mexico and Venezuela, copper in Chile, and coffee in Columbia, fluctuations in export prices are a primary source of fluctuations in government resources. Finally, NFPEs have often played a key role in the employment policy of the government.

For all these reasons, it is essential to include information on both local governments and NFPEs for all countries in the sample, and our dataset does so. This allows us to construct series for the general government (the consolidation of the central and local governments) and for the nonfinancial public sector (the consolidation of the general government and the NFPEs).

As argued above, flows of resources between different levels of government (including NFPEs) pose important analytical and policy issues, and a full understanding of the behavior of fiscal policy in Latin America requires an understanding of these flows. Hence, our dataset includes information on the transfers between different levels of the nonfinancial public sector. In consolidating the different levels of the nonfinancial public sector, we take into account these intersectoral flows.

An important issue of coverage arises also within the central government. In most Latin American fiscal systems, “decentralized agencies” outside the main budget often receive large amounts of earmarked revenues, and carry out important expenditure functions. The same, of course, holds for social security systems, which receive the bulk of social security taxes, and often substantial transfers from the central administration. Hence, our definition of central government generally includes

3. Gavin (1997) estimates that subsidies provided in the form of below-market prices charged by the public petroleum company accounted for nearly 3/4 of the oil windfall that accrued to the Mexican public sector during 1978–1982, amounting to 4% to 5% of GDP in 1980–1982. More recently, similar price subsidies have had enormous fiscal impacts in Venezuela.

these agencies, in addition to the central administration, which is typically covered by the national budget.⁴

2.2 BREAKDOWN OF THE BUDGET

While several existing studies of fiscal policy in Latin America focus mainly on the deficit, or at most total expenditure and revenues, we are interested in a more refined breakdown, for two main reasons. First, different budget items have different macroeconomic effects. Second, a decomposition of the budget is crucial for an understanding of the determinants of fiscal outcomes. For instance, as we show later, many of our findings on the cyclical sensitivity of fiscal policy in Latin America are unlikely to be interpretable as the result of the optimizing behavior of a benevolent dictator. Hence, we need more realistic positive models of fiscal policy in order to interpret these results; in this case, information on components of revenues and, in particular, expenditure can be of key importance in assessing the empirical relevance of the different positive models.

It is equally important specifically to include gross operating expenditures and revenues of nonfinancial public enterprises, rather than only the net operating surplus, because of the frequent use of NFPEs for employment purposes. Furthermore, we disaggregate operating expenditures into their wage and nonwage components, and operating revenues into sales and others. Besides operating revenues and expenditures, we have data on interest payments, transfers to and from the central government including taxes, and capital expenditure.⁵ This disaggregation is available for most years in every country.

2.3 QUASIFISCAL DEFICITS

The basic idea underlying the notion of the quasifiscal deficit is that it should capture all those transfers of resources from the public sector to the private sector that occur indirectly through the operations of the financial public sector. Thus, this notion should capture, among others, the transfers implicit in exchange-rate guarantees by the central bank, multiple-exchange-rate arrangements, interest-rate controls, etc. Because

4. Our primary source of information for the central government, the IMF Government Finance Statistics (which we use for 11 of the 13 countries), sometimes reports only data on the Central Administration, particularly in the 1970s or in the 1990s. When this happens, we supplement the Government Finance Statistics with data on the decentralized agencies and the social security system, whenever available. So far, we have been unable to incorporate decentralized agencies in Costa Rica prior to 1987.
5. For many country–years, capital expenditure can be further disaggregated into capital formation, lending minus repayment, and capital transfers. Also, for many country–years we have separate data on other nontax revenues.

of the extensive use of these policies in Latin America in the 1980s, the quasifiscal deficit can reach staggering proportions. For instance, according to Easterly, Rodriguez, and Schmidt-Hebbel (1994), in 1982 the quasifiscal deficit in Argentina was 25% of GDP.

While we recognize the importance of the quasifiscal deficit for certain purposes, we do not use it in our analysis, for two main reasons. First, and most importantly, in our view it mixes stocks and flows in a way that is difficult to rationalize. For instance, the face value of exchange-rate guarantees—a stock variable—often appears as a component of the quasifiscal deficit, even though the central bank might never be called upon to make good these guarantees, and therefore there might never be a cash flow associated with them.⁶ Second, measures of the quasifiscal deficit inevitably require highly subjective judgements; exactly because it is meant to capture all implicit transfers, there is virtually no end to the items one might want to include in it. In fact, Mackenzie and Stella (1996) list a total of 11 candidate components of the quasifiscal deficit, among which are “poorly secured and subpar loans” and “preferential rediscounting practices.” The problems in quantifying these components, and in ensuring a minimum of comparability across countries, seem evident.

2.4 INFLATION AND DATA QUALITY

Government accounts are among the many victims of the frequent bursts of inflation and hyperinflation in Latin America. At high levels of inflation, the interpretation of many budget figures becomes extremely difficult. The most obvious problem is with the treatment of interest payments, which can reach staggering proportions during hyperinflations (easily on the order of 20% of GDP). The preferred solution to this problem is to compute the real component of interest payments on domestic debt. However, data on the currency composition of public debt are available only for a few countries, mostly for the central government only, and rarely on a consistent basis. Our solution to this problem is to make extensive use of the primary surplus in our analysis, and to ensure that the results that we report are not unduly influenced by these potentially problematic data by dropping all country-years with very high inflation. The results that we report are robust to these checks. But problems of data quality are not confined to interest payments and to hyperinflations, particularly once one moves away from the central government. We encountered substantial variation across countries and over time in the quality of fiscal accounts: some countries—such as

6. This also means that the quasifiscal deficit is inconsistent with the cash basis for recording transactions that we adopt, whenever possible, in our Latin American database.

Costa Rica—seem to maintain very reliable accounts at all levels of the public sector, while in other countries, the quality of the information deteriorates sharply in some periods, such as data on local governments in Venezuela during the last decade. To test the robustness of our results, we have constructed a low-quality sample, based on our subjective assessment of the quality of the data, and we routinely exclude the low-quality data from our estimates. Here also we find that low-quality observations are not major outliers in our estimates. Finally, as a further check of robustness, we routinely re-estimate our regressions, dropping one country at a time.

3. *A Bird's-Eye View of Fiscal Policy in Latin America*

In this section, we briefly describe the main stylized facts of various fiscal aggregates in Latin America over the last 25 years.⁷ Throughout this section, our comments will focus on two main dimensions: a comparison of averages over the whole period between Latin America and the group of industrialized countries,⁸ and the main changes over time within each group. We begin with the general government, which is the natural unit of comparison between the two groups of countries.

3.1 FIRST MOMENTS

Table 1 presents simple averages of the main fiscal aggregates of the general government in Latin America and industrialized countries, over the whole 1970–1995 period and over each decade separately.⁹ This table

7. To ensure consistency between the aggregates and their components, we only use those country–years that include all main components of expenditures, and for both the central and local governments. This ensures that the deficits of each subsector are consistent with aggregate expenditure and revenues, and that the general-government budget items are equal to the sum of the same items of the central and local governments. Thus, the total number of observations in these tables can be less than the total number in the regressions of the next sections. Notice that total expenditure and revenues can still be slightly different from the sum of their components because of several adjustments that are occasionally made to the total, such as cash adjustments or adjustments for tax credits in some countries, which cannot be allocated to any specific component.
8. Our sample of industrialized countries consists of Australia, Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Norway, Spain, Sweden, the United Kingdom, and the United States. Our sources are the OECD National Income Accounts and EUROSTATs National Income Accounts. When we compare central-government taxes across the two regions, for consistency we use the IMF Government Finance Statistics also for the industrial countries.
9. In presenting these summary statistics, we face the choice between unweighted and weighted averages. Each has its advantages, but we opted for the former because Brazil and Mexico together account for more than 60% of the total population in our sample of Latin American countries, giving their experience disproportionate weight in a population-weighted aggregate.

Table 1 RELATIVE SIZE OF GENERAL GOVERNMENT

	Region	Value (%)			
		1970-95	1970-79	1980-89	1990-95
Total surplus/GDP	Latin America	-1.4	-1.3	-2.4	0.5
	Industrial economies	-2.5	-0.8	-3.3	-4.1
Total surplus/total revenue	Latin America	-10.6	-9.5	-17.3	1.4
	Industrial economies	-6.5	-3.1	-8.5	-9.2
Primary surplus/GDP	Latin America	1.3	-0.3	1.0	3.6
	Industrial economies	-0.4	-0.0	-0.5	-0.8
Primary surplus/total revenue	Latin America	1.1	-3.2	-2.1	14.0
	Industrial economies	-1.3	-0.8	-1.7	-1.7
Total revenue/GDP	Latin America	21.6	20.4	21.8	23.2
	Industrial economies	42.1	38.6	43.6	45.5
Total expenditure/GDP	Latin America	22.9	21.7	24.0	22.2
	Industrial economies	44.6	39.5	46.9	49.6
Primary expenditure/GDP	Latin America	20.2	20.4	20.6	19.1
	Industrial economies	42.4	38.6	44.1	46.3

Simple averages of country data. Number of observations: Latin America, 276; industrial economies, 413.

provides a substantial amount of information; here we highlight the main points.

First, a comparison of the size of deficits in Latin American and industrialized countries largely depends on the metric one adopts.¹⁰ As shares of GDP, the average deficit over the whole period has been virtually

10. In this section, deficits in both groups of countries are net of lending minus repayment.

This choice is dictated by the fact that the source of information for the group of industrialized countries is the National Income Accounts by the OECD and EUROSTAT, which record lending minus repayment below the line. Also, for Latin American countries we only have information about gross interest payments of the general government; therefore, in Table 1 we define the primary deficit as the overall deficit net of net interest payments in industrialized countries, and net of gross interest payments in Latin America. The difference is unlikely to be large, since interest received by the government is generally small.

identical in the two regions. On the other hand, the average deficit in Latin America has been substantially larger than in industrialized countries if measured as a share of tax revenues, which might be a better indicator of the ability of a country to service its debt.

These averages over the whole period obscure important differences over the two and a half decades of the sample. Latin America as a region displays a remarkable fiscal consolidation in the 1990s, with a fall in the average deficit relative to the 1980s by about 3% of GDP, while in the industrialized countries the deficit rose steadily throughout the period. If one looks at the primary deficit, this difference is even more marked, with steady improvement by a cumulated 3.7% of GDP.

Second, the average size of the Latin American state, as measured by total revenues, is about half that (21.6% of GDP) of the industrial countries (42.1% of GDP). It is important to note that the capacity to raise revenues of Latin American countries has grown only minimally over time (especially considering the low initial level): by only about 2.5% of GDP over the whole period, against an increase by 7% of GDP in the industrialized world. Third, the development over time of expenditure in the two regions shows an even more marked difference. In Latin America, the share of total expenditure to GDP has been remarkably stable, increasing in the 1980s by slightly more than 2% of GDP, but only because of the increase in interest payments. In fact, the share of primary expenditure in GDP stayed constant at about 20.5% in the 1970s and 1980s, and declines to 19.4% in the 1990s. Exactly the opposite pattern occurs in the industrialized region, where both total and primary expenditure increased steadily, and substantially—9% and 8% of GDP, respectively.

Fourth, the composition and evolution of revenues and expenditure (see Table 2) differs in the two regions. On the revenue side, notice the much larger share of nontax revenues in Latin America. This is a particularly volatile source of revenues, because it includes transfers of profits from fiscal monopolies and state-owned enterprises, royalties from oil extraction, etc. A comparison of the structure of tax revenue is possible only for the central government, because the numbers of observations on the individual revenue items of local governments drop substantially in Latin America. This table illustrates some familiar results, and some less familiar ones.

First, Latin American countries rely much more on indirect taxes (including taxes on international trade) than do industrialized countries. By the same token, the share of direct taxes is much smaller in Latin America. Furthermore, about 80% of income taxes in Latin America fall on corporations (a particularly volatile tax revenue) and 20% on individuals. In the industrialized countries, this proportion is virtually reversed.

Table 2 COMPOSITION OF GOVERNMENT SPENDING AND REVENUES

	Region	Value (%)			
		1970-95	1970-79	1980-89	1990-95
Nontax revenue/ total revenue	Latin America	18.1	17.0	18.5	19.0
	Industrial economies	8.4	7.6	8.9	9.0
Direct tax/total tax revenue	Latin America	27.3	29.6	26.5	25.5
	Industrial economies	39.8	40.7	39.6	37.8
Indiv. income tax/ total taxes	Latin America	5.1	5.9	5.2	2.5
	Industrial economies	28.9	28.9	29.1	28.4
Indirect tax/total tax revenue	Latin America	53.2	51.9	54.1	53.5
	Industrial economies	31.4	32.5	30.6	30.3
Intl. trade taxes/ total taxes	Latin America	16.3	19.7	16.2	11.2
	Industrial economies	1.9	2.8	1.4	0.9
Govt. consumption/ total expend.	Latin America	48.3	53.2	45.9	45.9
	Industrial economies	41.5	43.8	40.7	38.8
Transfers/total expenditure	Latin America	24.2	19.2	25.9	27.8
	Industrial economies	42.1	40.7	42.4	44.2
Capital expend./ total expend.	Latin America	18.2	22.0	16.2	16.8
	Industrial economies	7.9	10.0	6.7	6.1
Interest/total expenditure	Latin America	10.5	5.6	12.8	12.8
	Industrial economies	8.9	6.1	10.8	11.7

Simple averages of country data. Direct taxes include taxes on income and property but exclude contributions to the social security system. The sum of direct taxes and indirect taxes does not, therefore, add up to 100% of total tax revenue.

Importantly, there is no indication that Latin American countries have gotten better at collecting income taxes. In fact, both corporate and personal income taxes have fallen over time as shares of GDP and of total taxes; as a result, the typical Latin American central government in the 1990s collects only 2.5% of its total tax revenues from personal income taxes.¹¹ The slack has been largely taken up by indirect taxes, and in particular by taxes on goods and services, while the role of trade taxes has declined steadily.

On the expenditure side, Latin American countries spend much less on transfers and subsidies—24% of total expenditure against 42% in industrialized countries. The difference is partly made up by a larger share of government consumption; perhaps more surprisingly, the share of capital expenditure in total expenditure is about twice as large in Latin America.¹² Also mildly surprising is the finding that the share of gross interest payments in total expenditure is not very different in the two regions, and also increased roughly by the same proportion during the 1980s relative to the 1970s. In both regions, this increase in interest payments occurred at the expense of government consumption and capital expenditure: the share of transfers kept rising throughout the sample.

3.2 SECOND MOMENTS

In many respects, the most striking difference between fiscal aggregates in Latin America and in industrialized countries is not in their first moments, but in their volatility. Table 3 displays the average standard deviation of the rate of growth of each budget item, deflated by the GDP deflator (for the total and primary surplus, the table displays the standard deviation of the first differences of the GDP shares). This table highlights two main points. First, fiscal outcomes have been much more volatile in Latin America than in the industrialized world. Both the total and the primary surplus have been twice as volatile, while growth rates of (real) total revenues and expenditure have been three to four times as volatile. Each component of expenditure has been substantially more volatile in Latin America, with the biggest difference in transfers and government consumption. Thus, the higher volatility of the major fiscal aggregates in Latin America is not just the result of a composition tilted

11. Note, however, that we have only 26 observations on personal income taxes in the 1990s.

12. We believe that one should take the last figure with particular caution, for at least two reasons. First, this difference may have more to do with budgeting and accounting standards than with the true economic classification of expenditure. Second, it is likely that in Latin America some financial investment (sometimes also termed “lending minus repayment” or, improperly, “net lending”) might have slipped into the figures for capital transfers, which are part of capital expenditure.

Table 3 VOLATILITY OF FISCAL OUTCOMES

	Region	Average standard deviation (%)			
		1970-95	1970-79	1980-89	1990-95
Total surplus	Latin America	3.3	2.0	3.8	2.4
	Industrial economies	1.6	1.5	1.5	1.3
Primary surplus	Latin America	3.3	2.0	3.7	2.9
	Industrial economies	1.6	1.5	1.5	1.4
Total revenue	Latin America	12.2	9.8	12.9	9.1
	Industrial economies	3.6	3.4	2.8	3.5
Total expenditure	Latin America	12.8	9.0	14.9	9.0
	Industrial economies	3.1	3.0	2.3	2.5
Govt. consumption	Latin America	12.5	8.9	14.5	9.3
	Industrial economies	3.3	2.8	2.4	3.1
Transfers	Latin America	22.4	14.9	26.5	17.0
	Industrial economies	4.4	4.8	2.8	3.1
Interest payments	Latin America	33.2	28.2	33.4	26.1
	Industrial economies	9.6	8.2	9.1	6.5
Capital expenditure	Latin America	27.4	23.9	28.0	23.9
	Industrial economies	9.4	8.4	8.9	9.9

Averages of country-specific standard deviations. Total surplus and primary surplus: standard deviation of first differences of GDP shares. Other variables: standard deviation of log changes of real quantities, deflated with the GDP deflator.

towards more volatile components: as shown in Table 2, industrialized countries spend much more on a highly volatile component, transfers, than do Latin American countries.

Second, in the 1980s the volatility of fiscal outcomes increased dramatically in Latin America. This increase was across the board, both on the revenue and on the expenditure side. By contrast, in the industrial countries volatility has, if anything, fallen during the same period.

It might be argued that both the higher average volatility in Latin America, and its increase during the 1980s, should come as no surprise: the underlying macroeconomic environment in Latin America is two to three times as volatile as that of the industrial economies, and that volatility increased substantially during the 1980s. The question thus arises whether the volatility shown in Table 3 is merely a reflection of the underlying economic environment, to which fiscal outcomes passively

responded, or something else. Unfortunately, disentangling the sources of variability of fiscal policy is more difficult for Latin America than for the industrialized countries. Schematically, one can think of changes in fiscal variables as the sum of two components: the first reflects the automatic adjustment of the fiscal variable to the underlying economic environment, while the second is the “discretionary” change implemented by the policymaker. The cyclically adjusted fiscal figures routinely produced by international organizations partial out the first effect by estimating what the fiscal variable would be if the economic environment were fixed at some *benchmark* value. To do this, one needs two things: a measure of the benchmark value of the economic environment, and the endogenous or *passive* response of the fiscal variable to the economic environment. Both elements are largely unavailable for Latin America.

The typical benchmark value of the economic environment is potential, or trend GDP. However controversial this concept and its measurement are in industrialized countries, it is safe to argue that all the problems it raises will be severely compounded in Latin America. Even if one avoids these problems by adopting Blanchard’s (1990) view—that the best benchmark is last year’s output—a virtually unsurmountable problem still exists: in Latin America there are no systematic estimates of elasticities of the different budget items to output and unemployment. By contrast, the OECD routinely computes elasticities of the different taxes from statutory tax rates at the different income brackets and from the distribution of earnings.

Despite these difficulties, some indirect evidence can be obtained by regressing, country by country, the log change of each fiscal variable in real terms on a constant, the rate of growth of output, and the rate of change of the terms of trade. The average standard deviation of the residuals of these regressions (not shown) displays virtually identical patterns to those displayed in Table 3. This suggests that the fiscal volatility that we observe in Table 3 is more than a passive response to macroeconomic fluctuations.

3.3 THE ROLE OF LOCAL GOVERNMENTS

What has been the role of central and local governments in the recent developments of the Latin American public finance briefly surveyed above? This question is of interest in itself, but also in connection with the topic of the next section, where we compare the cyclical properties of fiscal policy in Latin America and in industrialized countries. As local governments have a more restricted ability to conduct a stabilizing fiscal policy, it is important to have an idea about the size and evolution over time of the local governments in the two groups of countries.

Here again there are many possible dimensions along which the issue can be analyzed. The next two tables try to condense the information that is most relevant to our analysis. Table 4 presents overall averages of the main aggregates. Because the size and role of local governments vary enormously with the size and institutional features of a country, we present averages for Latin America and the group of industrial economies in columns 1 and 2, and averages for the four large federal countries in each region in columns 3 and 4. To avoid cluttering the table, we do not present information on the time variation of these figures, but we discuss it in the text when relevant.

Table 4 LOCAL GOVERNMENTS

		Value (%)			
		All countries		Federal countries	
		Latin America	Industrial economies	Latin America	Industrial economies
Government					
Own surplus/GDP	Central	-0.3	4.6	0.2	2.7
	Local	-1.1	-6.3	-2.6	-5.0
Total own expenditure/GDP	Central	19.5	29.7	15.9	23.6
	Local	3.7	15.6	8.1	16.1
Local-govt. expenditure/central-govt. own expend.		24	63	58	81
Local-govt. own revenue/local-govt. total revenue		81	54	76	66
Govt. cons./total own expenditure	Central	44.8	29.8	31.1	32.1
	Local	60.5	61.8	53.6	60.8
Transfers/total own expenditure	Central	26.6	53.3	34.4	50.5
	Local	10.6	13.6	15.8	15.8
Capital expend./total own expend.	Central	17.6	6.1	17.3	4.9
	Local	25.8	18.1	26.1	16.6
Interest/total own expenditure	Central	12.0	10.8	18.8	12.6
	Local	2.1	6.6	4.5	6.8

Simple averages of country data. Federal countries (Latin American): Argentina, Brazil, Colombia, Mexico. Industrial countries: Australia, Canada, Germany, United States. "Own deficit" is net of transfers to local governments. "Own expenditure" excludes net transfers to local governments.

Table 4 conveys a number of messages. First, the average own budget surplus (that is, excluding net transfers from the central government) of Latin American local governments has been much smaller than in the industrialized countries. Because, as we have seen, the average deficit of the general government has been similar in the two regions, the average own balances of the central governments have behaved in radically different ways: a deficit of about 0.3% of GDP in Latin America, and a surplus of 4.6% of GDP in the industrialized countries. A similar pattern holds when only the federal countries are compared.

In both regions the own deficit of local governments has been fairly stable over time, increasing only slightly. Hence, all the movements in the balances of the general government that we have documented in Table 1 have been absorbed mainly by the central government, implying a large improvement in Latin America and a substantial worsening in the industrialized countries.

Second, the average size of the local governments (measured by their own expenditures) is much lower in Latin America than in the industrialized countries: 3.7% against about 15.6% of GDP. As a consequence, the ratio of the local-government expenditure to central-government expenditure (excluding net transfers to the local governments)—a rough indicator of the relative size of the two governments—is much higher in the industrialized countries than in Latin America—63% against 24%. Of course, this difference falls considerably, but does not disappear, when we consider federal countries. This gap has fallen slightly over time, reflecting the move towards decentralization in some Latin American countries.

Third, and perhaps most surprisingly, the ratio of own revenues to total revenues of the local government is much higher in Latin American countries than in industrialized countries: 81% against about 54%, and stable over time. Once again the difference is smaller when one compares federal countries, where it has shrunk over time: as the scope of local governments in Latin America has expanded, they have relied increasingly on transfers from the central government.

Fourth, the composition of expenditure of local governments is remarkably similar in the two regions. In both, local governments spend a much lower share on interest, and a much higher share on capital and government consumption. Thus, all the differences between the two regions in the composition of the general government expenditure are reflected mainly in the central government budget.

To gather further evidence on the role of local governments in Latin America, we have divided all episodes of increases in the primary deficit of the general government into “large fiscal expansions” (i.e., increases in the deficit by at least 1.5% of GDP) and “small fiscal expansions” (i.e., in-

Table 5 LOCAL GOVERNMENTS AND INCREASES IN THE DEFICIT

		Value (%)			
		Latin America		Industrial economies	
		Large expansions	Small expansions	Large expansions	Small expansions
Change, own primary surplus/GDP	Central	-3.3	-0.2	-2.0	-0.4
	Local	-0.2	-0.1	-0.7	-0.5
Change, own expenditure/GDP	Central	1.5	0.5	1.7	0.6
	Local	0.2	0.1	0.6	0.3
Change, net transfers to local government/GDP		0	0	0.4	0.2

Large expansion: increase in the primary deficit of the general government by at least 1.5% of GDP. Small expansion: increase in the primary deficit between 0 and 1.5% of GDP.

creases in the deficit between 0 and 1.5% of GDP), and we have asked the question: do local governments in Latin America disproportionately contribute to episodes of very expansionary fiscal policy? The answer, displayed in Table 5, is that the opposite seems to be true: on average, local governments in industrial economies seem to be responsible for a sizable part of large expansions; the contribution of Latin American local governments to episodes of very expansionary fiscal policy, by contrast, seems negligible. This statement also holds whether one considers the deficit, total expenditure, or net transfers between the two levels of governments.

The main conclusion we derive from this brief comparison of local governments in Latin American and in industrialized countries is that differences in the structure and role of local governments are unlikely to explain the strikingly different macroeconomic features of fiscal policy in the two regions, which we document in the next sections. While there may have been specific incidents in which local governments created fiscal disruption, there is little or no evidence for the region as a whole that local governments have been a more important cause of deficits in Latin America than in the industrialized countries; if anything, much of our evidence points in the opposite direction.¹³

13. One caveat to this conclusion is worth mentioning. In some cases local governments have accumulated large arrears that were then assumed by the central government. To the extent that this transaction is recorded below the line, it might not be recorded in our data.

3.4 THE ROLE OF NONFINANCIAL PUBLIC ENTERPRISES

Table 6 displays a few summary statistics on NFPEs in Latin America. Before discussing the main findings, however, it is necessary to mention briefly two important caveats. First, public-enterprise data are of considerably lower quality than central-government data, and possibly than local government data. Still, to the extent that the data show clear trends over time, it is not clear why the noise in the data should be responsible for these trends. Second, transfers between the general government and NFPEs are notoriously difficult to measure. We eliminate part of the noise by focusing on total transfers, without attempting a breakdown into current and capital transfers, which is largely subjective. Still, official data are unlikely to capture all transfers. In particular, our measure of transfers from NFPEs to the general government mostly include direct taxes and transfers of profits; thus, in general they do not include production taxes, which might be the most significant component of the flow from NFPEs to the general government. In addition, social security taxes paid by NFPEs are generally included in wage payments.

With these two caveats in mind, the first message of Table 6 is the remarkable turnaround in the balances of the NFPEs over time. The own (that is, excluding net transfers from the general government) surplus of the nonfinancial public enterprises has increased from -1.6% of GDP in the 1970s to 2.5% of GDP in the 1990s.

Second, the total own expenditure of nonfinancial public enterprises increased substantially—by almost 3% of GDP—over the 1980s and then fell by an even more substantial 5% of GDP during the 1990s, obviously reflecting the move towards privatization in many countries of the region.

To show the role of NFPEs, Table 6 also displays their share in the wage and capital expenditures of the nonfinancial public sector. As one

Table 6 NONFINANCIAL PUBLIC ENTERPRISES IN LATIN AMERICA

	<i>Value (%)</i>			
	1970–95	1970–79	1980–89	1990–95
NFPE total own expenditure/GDP	13.3	12.6	15.3	10.4
NFPE total surplus/GDP	0.2	-1.6	0.3	2.5
NFPE net transfers to gen. govt./GDP	1.5	0.4	1.8	2.7
NFPE wages/NFPS wages	23.9	22.4	25.9	22
NFPE capital expend./NFPS capital expend.	43.1	42.3	46.9	36.1

NFPE: nonfinancial public enterprises. NFPS: nonfinancial public sector. Number of observations is 257 to 277, depending on the item.

Table 7 VOLATILITY OF NONFINANCIAL PUBLIC ENTERPRISES IN LATIN AMERICA

	<i>Average standard deviation (%)</i>			
	1970-95	1970-79	1980-89	1990-95
Total own surplus	1.9	2.1	1.9	1.3
Total own expenditure	17.1	18.1	12.9	12.6
Wages	19.2	17.2	16.8	13.8
Capital expenditure	33.5	31.1	32.2	24
Total transfers to general government	56.5	51.2	58.3	39.4

Averages of country-specific standard deviations of growth rates of real quantities. For the surplus, standard deviation of first differences of GDP shares.

can see, NFPEs are responsible for about 25% of the wages and a remarkable 43% of the capital expenditure of the nonfinancial public sector. Consistent with the fall in the importance of NFPEs, these shares have fallen considerably in the 1990s.

Finally, Table 7 also shows that the volatility of the main aggregates of nonfinancial public enterprises has been comparable to that of the general government. In particular, note the very large volatility of transfers from NFPEs to the general government, and compare it with the volatility of other budget items of the general government from Table 3.

Notice, however, that compared to the figures of Table 3 the volatility of the budget items of NFPEs declined in the 1980s or increased very slightly, rather than increasing drastically as in the case of the general government.

4. *The Cyclical Properties of Fiscal Policy in Latin America*

We have argued that the volatility of fiscal outcomes in Latin America is striking. In this section we shall argue that the covariation of fiscal outcomes with macroeconomic fluctuations is even more so. What should we expect to see? According to the neoclassical approach to optimal tax policy (Barro, 1979), favorable shocks to the tax base should be accompanied by increases in the surplus (the optimal magnitude of which would depend primarily upon the persistence of the shock), and vice versa. Keynesian approaches to optimal fiscal policy reach a broadly similar result by different logic—according to that view, policy should, during macroeconomic booms, at least permit the appearance of surpluses that emerge from the automatic stabilizers that are built into the fiscal structure, and should perhaps go further with discretionary tax increases or spending cuts. Either approach suggests that surpluses should increase

Table 8 CYCLICAL PROPERTIES OF THE FISCAL BALANCE

	OLS coefficients			
	Overall		Good and bad times distinguished	
	Industrial economies	Latin America	Industrial economies	Latin America
Real GDP growth	0.368 (10.5)	0.042 (1.10)	—	—
Real GDP growth: good times (b_0)	—	—	0.258 (6.29)	0.083 (1.42)
Real GDP growth: bad times (b_1)	—	—	0.944 (7.42)	-0.019 (-0.25)
Percent change in terms of trade	0.034 (1.92)	0.015 (1.20)	0.027 (1.93)	0.015 (1.23)
Lagged fiscal balance	-0.174 (-5.64)	-0.292 (-5.43)	-0.173 (-5.80)	-0.295 (-5.49)
Degrees of freedom	314	257	313	256
Adjusted R^2	0.286	0.084	0.331	0.084
Significance, $b_0 = b_1$			0	0.35

General government. Dependent variable is the change in the overall fiscal surplus, measured as a share of GDP.

t -statistics are given in parentheses. Country dummy variables are included in all regressions.

in good times and decline in bad. We begin in Section 4.1 with the facts, and turn to interpretations in Section 4.2.

4.1 SYLIZED FACTS

The first column of Table 8 shows that the presumption of procyclical surpluses is borne out by the industrial-country data. That table reports the results of regressing the change in the fiscal surplus of the general government (measured as a share of GDP) on the rate of growth of real GDP, the percentage change in the terms of trade, and the lagged fiscal surplus.¹⁴ We interpret the coefficient on output growth as the impact on fiscal outcomes of changes in the real output and income, incorporating both automatic stabilizers and any discretionary policy responses to output shocks that authorities are typically able to muster during a year. (We shall have more to say about this interpretation below.)

The estimate, summarized in columns 1 and 2 of Table 8, suggests that in the industrial economies a one-percentage-point increase in the rate of

14. This is essentially the same specification as estimated by Bayoumi and Eichengreen (1995).

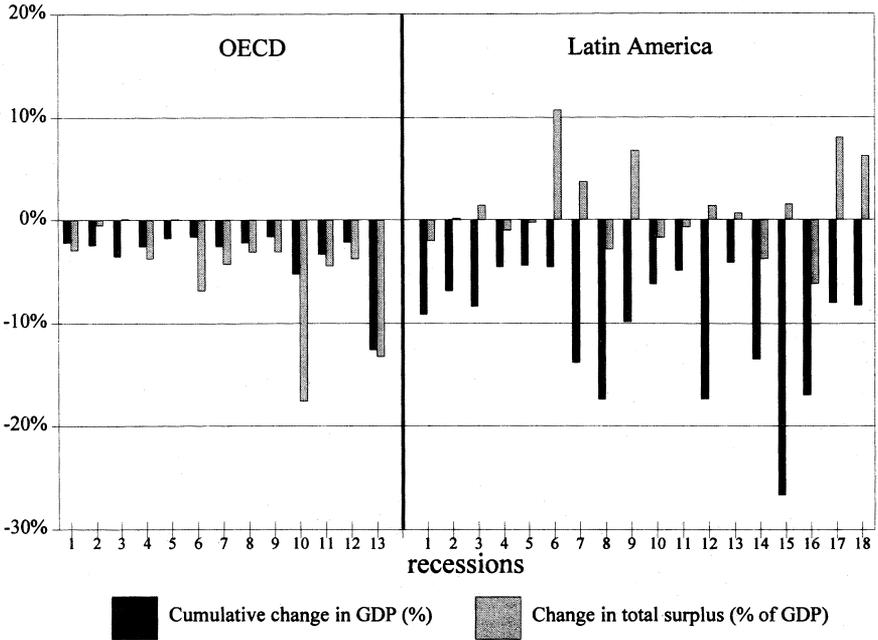
output growth is associated with an increase in the fiscal surplus of about 0.37 percentage points of GDP. In Latin America, on the other hand, the fiscal response is negligible; the point estimate is 0.042, and it is not statistically significantly different from zero. This weak relationship between the economy and the fiscal balance suggests procyclical discretionary fiscal policy responses to economic fluctuations; for in the absence of such a response the fiscal balance would naturally improve in good times and deteriorate in bad.

In Latin America we also see a much stronger relationship between the fiscal surplus and subsequent changes in the balance, implying that fiscal imbalances are less persistent there than in the industrial economies. In the industrial economies the half-life of an increase in the fiscal deficit is about 3.5 years; in Latin America, about 2 years. We will give an interpretation of this finding below.

4.1.1 Fiscal Policy Is Particularly Procyclical in Bad Macroeconomic Times The contrast between Latin America and the industrial economies is even sharper if we distinguish between good macroeconomic times and bad. Here we defined *bad times* as years during which a country's rate of output growth is less than its average rate of growth minus one standard deviation; all other times are *good times*. (Roughly similar results are obtained when bad times are defined as periods of negative output growth.) In columns 3 and 4 of Table 8 we allow the sensitivity of fiscal outcomes to differ in good and bad times.

In the industrial economies we discover a major asymmetry in the fiscal response to output shocks. During good times the budget surplus increases by about 0.25 percentage points for every percentage point by which GDP growth increases. During bad times, however, the fiscal response to changes in output growth is much larger: a one-percentage-point decline in GDP growth is associated with an increase in the fiscal deficit of nearly one percentage point of GDP. This asymmetry is statistically significant at very high confidence levels. It is consistent with the idea that recessions are economically and/or politically more costly than output booms, and that the fiscal policy response to them is accordingly stronger. It is also consistent with the idea that some elements of the fiscal structure, such as unemployment compensation, are relatively insensitive to the business cycle at high levels of economic activity, but become larger in deep recessions. The asymmetry could also be explained by standard tax-smoothing arguments if it is assumed that economic fluctuations associated with recessions are expected to be much less persistent than those of normal times, although this neoclassical explanation would be somewhat difficult to square with the evidence,

Figure 1 THE FISCAL BALANCE DURING DEEP RECESSIONS



presented below, that the asymmetry arises from the spending rather than from the tax side of industrial-country budgets.

Whatever the reason for the asymmetry observed in the industrial economies, it apparently does not apply to Latin America; the point estimates in column 4 of Table 8 suggest that any asymmetry in the Latin American data is the reverse of that found in the industrial countries; the fiscal balance is less, not more, sensitive to output fluctuations during bad times. This difference is not statistically significant, but if one focuses on deep recessions it becomes more evident. For this we defined *deep recessions* as episodes during which real GDP declined by more than 1.5% (industrial countries) or 4.0% (Latin America); in the years for which we have fiscal data there were 13 such episodes in our sample of industrial countries and 18 in our Latin American sample.

These episodes are displayed in Figure 1, which illustrates the close comovement of fiscal balances and the real economy in the industrial economies and the very weak relationship in Latin America. Table 9 gives some summary statistics for the episodes in Figure 1. During the typical deep recession, industrial-country real GDP declines by nearly 3.5% while the fiscal balance moves toward deficit by about 4.4% of GDP.

Table 9 REAL GDP AND THE FISCAL BALANCE IN DEEP RECESSIONS

	<i>Industrial economies</i>	<i>Latin America</i>
Average change in real GDP (%)	-3.3	-10.2
Average change in the fiscal surplus (% of GDP)	-4.4	2
<i>t</i> -statistic for the change in the fiscal surplus	3.2	1.9

In Latin America the typical deep recession involves a decline in real GDP of more than 10% while the fiscal balance has, on average, moved toward surplus by a full 2% of GDP. While there is substantial variation across episodes, this swing into surplus is statistically significant at conventional confidence levels.

So far we have focused on the behavior of the fiscal balance of the general government. The patterns that we have identified are similar for the central government and the nonfinancial public sector. As might be expected, we find that local government balances display only a weak relationship to economic fluctuations in both the industrial economies and Latin America, though there is some evidence of countercyclical movements in local-government fiscal balances of the industrial economies, especially in bad times. We also find that the surplus of nonfinancial public enterprises is negatively related to economic activity in Latin America, thus reinforcing the procyclicality of fiscal policy at the level of the nonfinancial public sector. One interpretation of this finding is that public-sector pricing and employment policies have been used as a mechanism to provide subsidies to workers and users of public services, and that the subsidies provided in this way have, like explicit budgetary subsidies, been provided in a procyclical manner.

4.1.2 Public Spending Is Particularly Procyclical in Latin America In Table 10 we explore the cyclical properties of major spending and revenue items. Columns 1 and 2 of that table report the relationship between real GDP growth and the growth rate of the budgetary aggregate in a regression that also includes the growth rate of the terms of trade, the lagged fiscal balance, and country dummy variables. Fiscal revenue increases in rough proportion to GDP growth, in both countries, though there is some indication that revenue is more sensitive to economic fluctuations in Latin America than in the industrial economies.

This difference is minor, however, in comparison with differences in the behavior of spending in the two regions. In the industrial economies total spending is approximately uncorrelated with output fluctuations,

Table 10 CYCLICAL PROPERTIES OF REVENUE AND SPENDING

	<i>Elasticity</i>					
	<i>Real GDP growth</i>		<i>GDP growth, good times</i>		<i>GDP growth, bad times</i>	
	<i>Industrial economies</i>	<i>Latin America</i>	<i>Industrial economies</i>	<i>Latin America</i>	<i>Industrial economies</i>	<i>Latin America</i>
Total revenue	0.93 (11.85)	1.36 (8.92)	0.916 (9.56)	1.20 (5.20)	0.988 (3.43)	1.60 (5.3)
Nontax revenue	0.29 (1.01)	0.88 (2.21)	0.352 (1.02)	0.39 (0.65)	-.067 (-0.06)	1.62 (2.05)
Tax revenue	0.96 (9.44)	1.51 (9.44)	0.976 (10.76)	1.23 (5.09)	0.854 (3.04)	1.94 (6.09)
Total expenditure	0.09 (1.23)	1.09 (6.85)	0.277*** (3.177)	0.77* (3.22)	-0.892*** (-3.30)	1.58* (4.99)
Capital expenditure	0.21 (0.40)	2.32 (6.62)	0.104 (0.16)	1.73 (3.23)	0.799 (0.40)	3.16 (4.62)
Government consumption	0.30 (4.24)	1.24 (7.98)	0.400** (4.72)	0.96 (4.03)	-0.238** (-0.91)	1.64 (5.43)
Subsidies and transfers	-0.24 (-2.33)	0.58 (1.73)	0.003*** (0.02)	0.37 (0.72)	-1.373*** (-3.56)	0.88 (1.34)

General government, growth rates of spending and revenue. Elasticities with respect to GDP growth in a regression that also includes the growth rate of the terms of trade, the lagged fiscal balance, and country dummy variables. *t*-Statistics are given in parentheses. Asterisks indicate that the difference between the coefficients for output growth in good and bad times is statistically significant at the 10% (*) , 5% (**) and 1% (***) confidence levels.

with slightly procyclical government consumption being offset by the countercyclical behavior of government subsidies and transfers. In Latin America, however, total expenditure and its components are highly procyclical. This suggests that the procyclicality of Latin American fiscal policy is related to policy responses, not differences in the relationship between fiscal revenue and the cycle.

Table 10 also documents interesting asymmetries in the behavior of government spending.¹⁵ In the industrial economies, government consumption is moderately procyclical in good times, while capital spending and transfers are roughly uncorrelated with economic fluctuations. During bad times, however, government consumption and transfers display a pronounced countercyclical pattern—the deeper the recession, the higher the spending. It is thus the behavior of public spending, not revenue, that explains the more pronounced countercyclical behavior of the fiscal balance in the industrial economies.

15. There is little evidence of asymmetry in the behavior of fiscal revenues for either Latin America or the industrial economies.

In Latin America there is some evidence of asymmetric behavior in public spending, but rather than becoming countercyclical, public spending appears to become even more procyclical during bad economic times. Recessions are thus associated with exaggerated collapses in public spending.

4.1.3 Cyclical Properties of the Inflation Tax It is by now conventional to view inflation as a fiscal phenomenon, and in that context it is natural to investigate the cyclical properties of the inflation tax rate. Here too we find important differences from the industrial economies.¹⁶ The first two columns of Table 11 summarize the cyclical properties of the inflation tax in Latin American and the industrial economies. We find that in the industrial countries, the inflation tax rate tends to increase when growth is rapid—consistent, perhaps, with something like a Phillips curve. In Latin America the opposite is true—inflation tends to accelerate when output growth is low. Thus, reinforcing the procyclical pattern found in the rest of the budget, the inflation tax tends to become more contractionary during periods of slow economic growth and conversely. There is also some evidence that this pattern is stronger during bad times than in good times (see columns 3 and 4 of Table 11), though the difference in the estimated coefficients is not statistically significant.

This strong link between inflation and the macroeconomy helps explain the strong procyclicality of public spending in Latin America, where bad times are associated with a burst of high inflation that erodes the real value of public spending commitments that are set in nominal terms, or at least imperfectly indexed to the price level.

It is also noteworthy that in Latin America high fiscal deficits are strongly associated with subsequent increases in the inflation rate, unlike in the industrial economies, where there is a weaker (but nevertheless somewhat puzzling) relationship between fiscal balances and subsequent movements in inflation of the opposite sign. This suggests that inflation has acted much more like an instrument of fiscal policy in Latin America than it has in the industrial economies.

Policy makers may not, of course, have viewed things that way. In fact, we shall provide evidence below that fiscal deficits have been associated with higher inflation at least in part because they have led to a burst of

16. The inflation tax rate is defined here as the inflation rate divided by one plus the inflation rate; this gives the (percentage) erosion of the real value of nominal assets due to inflation. Focusing on this tax rate, which is of course bounded below one, has the advantage of reducing the extreme skewness caused by hyperinflationary outliers in our data set. Our measure of inflation is the December-to-December change in the consumer price index.

Table 11 CYCLICAL PROPERTIES OF THE INFLATION TAX

	<i>OLS coefficients</i>			
	<i>Overall</i>		<i>Good and bad times distinguished</i>	
	<i>Industrial economies</i>	<i>Latin America</i>	<i>Industrial economies</i>	<i>Latin America</i>
Real GDP growth	0.291 (5.59)	-0.603 (-5.72)	—	—
Real GDP growth: good times (b_0)	—	—	0.319 (5.01)	-0.466 (-2.93)
Real GDP growth: bad times (b_1)	—	—	0.154 (0.83)	-0.812 (-3.88)
Percent change in terms of trade	-0.136 (-6.69)	0.000 (0.01)	-0.134 (-6.56)	0.001 (0.03)
Lagged fiscal balance	0.159 (3.79)	-0.612 (-4.43)	0.158 (3.77)	-0.623 (-4.5)
Lagged inflation tax rate	-0.299 (-8.02)	-0.284 (-7.60)	-0.297 (-7.95)	-0.283 (-7.58)
Degrees of freedom	319	267	318	266
Adjusted R^2	0.303	0.215	0.302	0.216
Significance, $b_0 = b_1$			0.44	0.25

Dependent variable is the change in the inflation tax rate. *t*-Statistics are given in parentheses. Country dummy variables are included in all regressions.

inflation associated with the abandonment of fixed-exchange-rate regimes. But, whether the link between inflation and the budget is advertent or the endogenous result of financial crises associated with large fiscal imbalances, the end result is similar.

4.1.4 Inflation and the Budget These results raise the question whether the procyclicality of fiscal outcomes in Latin America is due primarily to the procyclicality of the inflation tax, shocks to which erode the real value of nominal spending commitments. Persson, Persson, and Svensson (1996) have recently argued that in Sweden an unanticipated increase in the rate of inflation could generate a large reduction in the real value of public spending, and increase in the fiscal surplus, because so much of spending is effectively unindexed. Is a similar mechanism at work in Latin America? Is fiscal policy a monetary phenomenon?

We lacked the information required to conduct the structural analysis of Latin American budgets that Persson, Persson, and Svensson were

able to conduct for Sweden, but instead asked whether inflationary surprises¹⁷ helped predict fiscal outcomes in the region, and whether the procyclicality that we described above remains evident after an attempt is made to control for the impact of inflationary shocks on the budget. The results should be interpreted with caution, because there is at least as much reason to expect that fiscal shocks affect inflation as the reverse; but some results are nevertheless worth reporting. First, we found that in Latin America a shock to the inflation tax rate is associated with significantly lower growth in real public spending, particularly on public consumption and capital spending. However, it is also associated with significantly lower revenues, perhaps reflecting the well-known Tanzi–Oliveira effect of inflation on fiscal revenue. The net result is a deterioration of the fiscal balance, not an improvement, whereas a similar analysis for the industrial economies suggests that an inflationary surprise is associated with a larger fiscal surplus. Finally, and most important for our purposes, the estimated relationship between fiscal outcomes and real output growth was largely unaffected by the inclusion of the inflation shock; inflation may be one mechanism by which procyclical fiscal outcomes are generated, but it is not the only one.

4.2 INTERPRETATIONS: WHY HAS FISCAL POLICY BEEN PROCYCLICAL IN LATIN AMERICA?

4.2.1 A Neoclassical Explanation The much weaker correlation between fiscal surpluses and macroeconomic fluctuations in Latin America would be consistent with the neoclassical approach to fiscal policy if economic fluctuations were much more persistent in Latin America than in the industrial economies. This is not, however, the case; the persistence of movements in real GDP growth is in fact slightly lower in Latin America than in the industrial economies.¹⁸

4.2.2 A Keynesian Explanation The comovement of fiscal outcomes and economic activity differs sharply in Latin America and the OECD, and Latin American patterns seem at variance with normative theories of

17. Our measure of the inflation surprise is the residual from a regression of the inflation tax on its lag, country dummy variables, lagged output growth, the lagged fiscal surplus, and contemporaneous and lagged changes in the terms of trade.

18. When we regressed real GDP growth on lagged GDP growth and country dummy variables, the coefficient on lagged GDP growth was .353 in Latin America and .401 in the industrial economies. The difference is not statistically significant, but the coefficients are estimated precisely enough to rule out the hypothesis that shocks to output are substantially more persistent in Latin America than in the industrial economies. There is also somewhat less persistence in the Latin American terms of trade than in those of the industrial economies.

optimal fiscal policy. What explains this procyclicality? We can think of at least three potential explanations. The first and arguably most obvious is that we have the causality wrong: that in Latin America fiscal contractions are causing declines in economic activity through some sort of Keynesian mechanism, and that the positive association that we see between fiscal policy and output growth represents the influence of changes in fiscal policy on the level of economic activity, rather than the reverse. We think that this is probably part of the story, at least in the sense that the procyclical fiscal policy has amplified economic fluctuations, and we would certainly not want to argue that there have never been cases in which an exogenous fiscal contraction created an economic downturn, or conversely.

However, we do not think this is the whole story. It does not, for example, explain the asymmetry between good and bad times that we observe in the data. It is also not fully supported by our reading of important episodic evidence. Consider, for example, the experiences of Argentina and Mexico during 1995. Both countries were hit by a major shock at the end of 1994. Reasonable observers disagree about the underlying cause of the crisis, but nobody, to our knowledge, has suggested that it resulted from an exogenous tightening of fiscal policy in the two countries. However, the recessionary impact of the shock put pressure on both countries' public finances, and in the absence of a fiscal policy response would have resulted in substantial fiscal deficits. The prospect of such deficits contributed to the financial panic that threatened these (and, briefly, other) countries in the first half of 1995, and to reassure investors fiscal authorities in both countries announced major fiscal retrenchments, in the midst of what was by then quite obviously going to be a year of deep recession. While this procyclical fiscal response almost certainly magnified the recessionary impact of the initial shock, the fiscal contraction was not the underlying cause of the recession, but was instead the best response of policymakers to the economic and financial environment created by the recession, given the country's precarious access to financial markets.

The "tequila" crisis of 1995 was special in some respects, but we suggest that the procyclical fiscal response to the economic downturn has been a typical feature of the Latin American business cycle. Whatever the underlying cause of an economic downturn, it frequently generates doubts about the viability of the public finances, leading to a curtailment of the noninflationary finance required to run a countercyclical policy and often eliciting a procyclical fiscal contraction. We shall have more to say about this below.

4.2.3 Voracity Effects A second class of explanations for the procyclical-ity of fiscal policy is based upon political–economic interactions that explain overspending of transitory shocks to fiscal revenue.¹⁹ In Velasco (1994) and Tornell and Lane (1997), for example, the voracity effect arises because of a fiscal commons problem. If the various interest groups that compete for a share of tax revenue view fiscal resources as a common pool, each group will be unwilling to reduce its claim on a surge in fiscal revenue, knowing that the benefits of this moderation will largely accrue to other interest groups. Talvi and Végh (1996) consider a setup in which a benevolent social planner sets tax rate optimally, taking into account, however, that any fiscal surpluses that result will generate political pressures that result in higher, wasteful public spending. The social planner must trade off the benefits of tax smoothing against the costs of this wasteful spending. They show that the social planner will respond to a transitory revenue boom by lowering tax rates, thus running smaller fiscal surpluses than would be called for in a world without political distortions, while the political distortion generates higher public spending during the boom. Similarly, an adverse fiscal shock leads to increased taxes and lower public spending. In a two-period model with three income groups, Perotti (1996) shows that in poor economies characterized by high inequality in the distribution of income, a transitory, positive shock could be all consumed in the first period, and would also generate a larger budget deficit. This feature is due to the interplay of the three groups, with the two groups at the extremes of the income distribution forming a coalition in favor of very high deficits, at the expense of the middle group. According to Dornbusch and Edwards (1990) and Sachs (1989), this was a feature of many episodes of populist policies in Latin America.

4.2.4 The Role of Borrowing Constraints While the evidence that we have provided here certainly falls short of a test for the existence of such voracity effects and the political mechanisms upon which they rely, such effects seem to us to be plausible explanations for the strong link between public spending and the business cycle, particularly as explanations for the public-spending boom that accompanies good macroeconomic times. However, we do not think that they are the end of the story. Our view is that fiscal policymakers in Latin America have typically faced a loss of confidence and thus intensified borrowing con-

19. Eichengreen, Hausmann, and von Hagen (1996) lay out in more detail potential links between such policy distortions and their implications for fiscal policymaking in Latin America.

straints during bad macroeconomic times. The loss of market access makes it impossible to run a countercyclical fiscal policy, at least in bad times. A full description of Latin American fiscal outcomes needs to account for this *precarious creditworthiness*.²⁰

The idea that borrowing constraints tend to be reinforced during bad times provides an explanation why fiscal policy is particularly procyclical during such times; authorities might like to implement more countercyclical fiscal policies, but they are prevented from doing so by their inability to finance the implied fiscal deficits.²¹ The precariousness of Latin American governments' access to noninflationary finance of fiscal imbalances also helps explain why fiscal deficits are less persistent in Latin America than in the industrial countries—we view it as evidence that financial markets keep Latin American governments on a shorter financial leash than they provide to governments in the industrial countries. And the very high sensitivity of inflation to economic fluctuations, especially in bad times, and to fiscal imbalances is also consistent with this view; if one views inflation as a fiscal resource of last resort, then sudden bursts of inflation during bad times offer support for the idea that alternative financing sources have become much more scarce.

There is more direct evidence for the idea that borrowing constraints have intensified during bad times and have played an important role in reinforcing the procyclicality of fiscal policy in Latin America.²² While such constraints cannot be observed directly, their presence can be inferred from the use of *emergency* credit. In the balance-of-payments statistics reported by the International Monetary Fund, two such sources of credit appear: IMF credit, which is typically provided only when alternative sources of financing have become much more scarce, and *extraordinary credit*, which comprises arrears and special financing operations such as the U.S. Treasury's support for Mexico during 1995.

To see whether the use of such credit is associated with the bad times during which we find fiscal policy to be particularly procyclical, we

20. See Gavin *et al.* (1996) for an extended discussion of the economic consequences of and policy responses to this precarious creditworthiness.

21. Gavin and Perotti (1996) provide evidence that the private as well as the public sector in Latin America has been afflicted by tighter borrowing constraints during bad times. In the industrial economies private saving is positively correlated with output shocks and shocks to public saving, both consistent with consumption-smoothing behavior if the shocks are perceived as partly transitory. In Latin America this pattern is observed in good times, but not in bad, which is consistent with the idea that in bad times the private sector is unable to obtain the access to credit required to smooth consumption.

22. It would seem natural to investigate the behavior of real interest rates during bad times. Unfortunately, in many countries for much of our sample, domestic financial markets were heavily regulated. Also, as we argued above, inflation tends to be higher during bad times, complicating efforts to compute *ex ante* real interest rates.

regressed the use of such credit (measured as a share of exports of goods and services) on country dummy variables and a dummy variable that takes the value one when the country is experiencing bad times, as defined above. The coefficient on the bad-times dummy variable thus represents the amount by which the use of this emergency finance tends to increase in bad times, compared with normal times in a given country.

As Table 12 indicates, there is a strong positive correlation between bad times and the use of such emergency finance, suggesting that bad times are indeed times of intensified borrowing constraints.

Is there evidence that these borrowing constraints contribute to the procyclicality of fiscal policy in Latin America? Such borrowing constraints ultimately derive from investors' fears that a fiscal deficit will become unmanageable and lead to default. If they are an important explanation for the procyclicality of fiscal policy, one would therefore expect that countries with high initial deficits would display more pronounced procyclicality than countries that enter a period with low fiscal deficits. To investigate this we re-estimated the relationship between output growth and the fiscal balance, allowing the relationship to differ depending upon whether fiscal deficits were large (greater than 3% of GDP) or small in the preceding year. The results, summarized in Table 13, provide some support for the significance of credit constraints. We found that in Latin American countries that enter a year with low fiscal deficits, the fiscal balance responds to output shocks in a moderately countercyclical manner—the point estimate is that a one-percentage-

Table 12 USE OF EXTRAORDINARY
FINANCE DURING BAD TIMES

	<i>Coefficient</i>	
	Industrial economies	Latin America
IMF credit	.001 (0.84)	.014 (2.49)
Extraordinary finance	.000 (0.06)	.052 (2.63)
Total	.000 (0.05)	.066 (3.03)

Dependent variable is measured as a share of exports of goods and services. Reported statistics are the estimated coefficient on a dummy variable that takes the value one during bad times, as defined in the text, and zero otherwise. *t*-Statistics are given in parentheses. Country dummy variables are included in all regressions.

Table 13 CYCLICAL PROPERTIES OF THE FISCAL BALANCE: DOES THE INITIAL DEFICIT MATTER?

	Coefficient	
	Industrial economies	Latin America
Real GDP growth, low initial deficit	.359 (9.21)	.115 (2.36)
Real GDP growth, high initial deficit	.392 (6.80)	-.057 (-1.01)
Change in terms of trade (%)	.034 (2.35)	.014 (1.15)
Lagged fiscal balance	-.167 (-4.96)	-.330 (-5.94)
Degrees of freedom	313	256
Adjusted R ²	.284	.101
Significance: $b_0 = b_1$.596	.018

Dependent variable is the change in the surplus, measured as a share of GDP. *t*-Statistics are given in parentheses. Country dummy variables are included in all regressions.

point increase in GDP growth is associated with an increase in the fiscal surplus of 0.11 percentage points, and this estimate is significantly different from zero at conventional confidence levels. However, in Latin American countries that enter a period with high fiscal deficits, the fiscal balance responds negatively to output shocks, and while the estimated coefficient is not significantly different from zero, the hypothesis that the cyclical sensitivity does not depend upon initial deficit can be rejected at high confidence levels.

In the industrial economies, in contrast, there is essentially no evidence that initial deficit matters, suggesting that borrowing constraints have not been a factor in industrial-country public finance.

5. Fiscal Policy, the Exchange Regime, and Economic Instability

Thus far, we have provided evidence that fiscal policy behaves very differently in Latin American countries than in the industrial economies—fiscal outcomes have been much more volatile, and have displayed a pronounced cyclical pattern that contrasts sharply with fiscal outcomes in the industrial economies. If, as we argue, credit constraints play a role in the generation of this volatility, then it seems likely that the volatility of

the macroeconomic environment that characterizes the region is a key determinant of the procyclicality of Latin American fiscal policy; credit constraints promote procyclicality only to the extent that the underlying macroeconomic environment is volatile enough periodically to force the economy into the constrained regime. Of course, the causality runs in both directions, for the procyclicality of fiscal policy in turn exacerbates the instability in the underlying macroeconomic environment.²³

From a policy perspective, one way for a country to cut this Gordian knot is to introduce institutions that can better tie the hands of undisciplined policymakers. For small open economies like those of Latin America, among the most prominent of such institutional restraints is the exchange-rate regime. The use—and the associated theory—of exchange-rate regimes as a way to constrain monetary policy has a long history in Latin America. As inflation subsided everywhere in the region, a second dimension has attracted increasing attention, in both theoretical and policy circles: the role of exchange-rate regimes as mechanisms to secure the fiscal restraint required for a lasting inflation stabilization. In this section, we explore the link between fiscal policy, the exchange-rate regime, and economic instability.

We wish to be explicit from the outset about what we hope to achieve in this section. As in everything that we have done so far, reverse causality is a serious potential problem here. We have not completely solved this problem and are, in fact, skeptical that anybody will ever convincingly do so. Our goal is to present the basic facts, and elicit from them as much information as possible without doing violence to the data, bearing in mind the limitations imposed by the limited degrees of freedom available for this exercise. Despite these limitations, we believe that the data speak clearly enough to seriously undermine the plausibility of a wide range of seriously considered hypotheses.

We ask two types of questions. First, is there any evidence that the exchange-rate regime disciplines fiscal policy? As the answer appears to be no, we then explore the relationship between fiscal policy and switches between regimes. We have two motivations here. First, we study the behavior of fiscal policy in the years surrounding a change in the exchange rate regime to obtain sharper insights into the potential disciplining efforts of alternative exchange-rate regimes. We then investigate the empirical association between fiscal policy and subsequent changes in the exchange-rate regime, focusing on episodes in which

23. Gavin et al. (1996) lay out an argument for a vicious cycle of volatility and procyclicality. Aizenman, Gavin, and Hausmann (1996) formalize this idea. Talvi and Végh (1996) derive a link between macroeconomic volatility and procyclical fiscal policy through a political-economy mechanism not involving credit constraints.

fixed exchange rates have been abandoned in favor of more flexible regimes.

5.1 DO FIXED EXCHANGE RATES PROMOTE FISCAL DISCIPLINE?

There is a substantial tradition, arguably even a conventional wisdom, to the effect that fixed exchange rates generate more discipline than do flexible rates.²⁴ Argentina's commitment to a pegged exchange rate—popular because it is associated in the popular imagination with the elimination of that country's hyperinflation—is often cited as an important factor in generating political support for responsible fiscal policies. Unlike many pieces of conventional wisdom, this one is not innocuous, and has actually been known to affect policy. The recent (and short-lived) Bucarám government in Ecuador proposed as a centerpiece of its (even shorter-lived) economic strategy an Argentine-style “convertibility plan,” with the explicit objective of securing therewith a political commitment to fiscal discipline, and a currency board has recently been proposed by the International Monetary Fund for Bulgaria as a means of providing the fiscal discipline that is now lacking in that country.

Recently, however, Tornell and Velasco (1995) have suggested that the theoretical case for this conventional wisdom is weak. In their model fixed exchange rates promote greater fiscal discipline if policymakers are patient, whereas flexible exchange rates promote fiscal discipline if policymakers are impatient. The idea is that lax fiscal policy generates inflation under both fixed and flexible exchange rates—the main difference is that it does so immediately under flexible exchange rates and after a potentially long delay under fixed rates. Impatient governments are more heavily influenced by the short term, so that the immediate inflation generated by lax fiscal policy under flexible exchange rates provides a more effective deterrent to fiscal indiscipline than the delayed inflation that would be generated under fixed rates.

Tornell and Velasco also provide suggestive evidence that fixed exchange rates do not promote fiscal discipline, arguing that exchange-rate-based stabilizations have not, in general, enjoyed more success in securing a fiscal adjustment than have money-based stabilizations. Our data set permits a more direct test of the hypothesis. We begin with a naive approach to the question, simply asking whether, on average, Latin American countries have tended to have higher or lower fiscal deficits under fixed exchange rates. To answer this question, we re-

24. See, for example, Giavazzi and Pagano (1988). Edwards (1992) provides empirical evidence that countries that began the 1980s with fixed exchange rates experienced, on average, lower inflation rates over the subsequent decade. He did not provide evidence on whether this lower inflation was associated with more restrictive fiscal policies.

Table 14 ARE FIXED EXCHANGE RATES ASSOCIATED WITH INCREASED FISCAL DISCIPLINE?

	Coefficient			
	Overall surplus	Primary surplus	Revenue and grants	Total expenditure
<i>Specification 1</i>				
General government:	-.010	-.014	-.002	.006
Latin America	(-1.58)	(-2.15)	(-0.47)	(1.00)
Industrial economies	.001	.002	.005	.005
	(0.28)	(0.38)	(1.64)	(1.46)
Nonfinancial public sector:	-.021	-.023	-.006	.008
Latin America	(-2.39)	(-2.57)	(-0.84)	(1.11)
Industrial economies	—	—	—	—
<i>Specification 2</i>				
General government:	-.007	-.015	-.008	.001
Latin America	(-1.22)	(-2.27)	(-1.56)	(.015)
Industrial economies	.004	.004	-.008	-.007
	(1.01)	(1.11)	(-2.30)	(-2.18)
Nonfinancial public sector:	-.022	-.028	-.009	.010
Latin America	(-2.45)	(-2.97)	(-1.39)	(1.52)
Industrial economies	—	—	—	—

Specifications are described in the text. Statistic reported is the coefficient on a dummy variable that takes the value one during periods when the economy is operating under fixed exchange rates and zero otherwise. *t*-Statistics are given in parentheses. Country dummy variables are included in all regressions.

gressed a number of fiscal outcomes, measured as a share of GDP, on country dummy variables and a dummy variable that is equal to one if the economy was operating under a fixed exchange rate during the year, and zero otherwise.²⁵ These regressions are simply intended to display in a compact way the summary statistics on fiscal outcomes under different exchange regimes, after accounting in a crude way for country-specific factors. The results of this estimation are reported in Table 14, as specification 1.

The results contradict the conventional wisdom. In Latin America, for both the general government and, more strongly, the nonfinancial public sector, fixed exchange rates are associated with lower fiscal surpluses,

25. The source of the data is the International Monetary Fund's *Exchange and Trade Relations*, various issues. The variable utilizes a strict definition of a fixed exchange rate, including only those exchange-rate regimes that the IMF categorizes as pegged to a single currency or a basket of currencies. Regimes categorized as "limited flexibility" are categorized as flexible.

both overall and primary, than are flexible exchange-rate regimes, and the estimated effect is both economically and statistically very significant. (This does not hold for the industrial economies, where the correlation between exchange regimes and fiscal outcomes was stubbornly negligible.) The point estimate suggests that the overall surplus of the nonfinancial public sector has tended to be more than 2 percentage points higher under flexible exchange rates than it has been under fixed exchange rates. The contributions of spending and revenue to the impact on the overall deficit are not precisely estimated, though the point estimates suggest that both contribute to the result in roughly equal measure.

In the results given under specification 2 in Table 14 we regressed the change in the fiscal variable on the dummy variable for fixed exchange rates, output growth in good times and bad times, the percentage change in the terms of trade, and the lagged fiscal balance, to control for the effects of macroeconomic conditions that might be systematically linked to the exchange-rate regime. To address the problem of endogeneity in the exchange-rate regime, albeit in a very partial and naive way, we instrumented the dummy variable for the exchange-rate regime with the exchange regime in the previous period.²⁶ (We will have more to say on the endogeneity problem below.) The results again suggest, and in general more strongly, that countries that operate under fixed exchange rates tended to experience substantially larger deficits than those that operated under flexible exchange rates.

5.2 WHAT CAN BE LEARNED FROM EXCHANGE-REGIME SWITCHES?

We have seen that there is a clear statistical association between fixed exchange rates and large fiscal deficits. We can think of three reasons why this may not reflect a causal relationship from exchange-rate regimes to fiscal outcomes. First, it could be that in the sample fixed exchange rates happen to be associated with a less favorable macroeconomic environment, which in turn induces larger fiscal deficits. Since we controlled for the macroeconomic environment in specification 2 of Table 14, the evidence presented above addresses this criticism.

The other two reasons have to do with the potential endogeneity of the exchange-rate regime. First, it might be that a policymaker with a penchant for fiscal indiscipline would choose a fixed-exchange-rate regime because it facilitates the pursuit of this policy. In the Tornell–Velasco framework, for example, it seems likely that impatient policy-

26. The results do not differ substantially if instead we estimate using ordinary least squares with the exchange-regime variable entering contemporaneously or with a lag.

makers would not only tend to run more expansionary fiscal policy than would patient policymakers, but, given the choice, would also choose to operate under a fixed-exchange-rate regime, because that regime lowers the perceived costs (to the policymaker) of fiscal indiscipline. Note, however, that this source of joint endogeneity does not contradict the line of causality running from fixed exchange rates to fiscal indiscipline, but depends on it; in the absence of a causal link from the exchange rate regime to fiscal laxity, undisciplined policymakers would have no reason to choose fixed exchange rates. If this is the story about endogeneity of the exchange regime, then the statistically significant correlation between fiscal outcomes and the exchange regime that we document would provide evidence for the existence of a causal link from the exchange regime to fiscal outcomes, though it would not provide meaningful evidence on the magnitude of the fiscal impact of imposing a specific regime on a policymaker, for example, by constitutional amendment.

This brings us to the third possibility, which is that some unobserved political or economic variable causes policymakers to choose both a fixed exchange rate and a loose fiscal policy (and conversely), despite the absence of any causal relationship between the exchange regime and the fiscal policymaking process. In contrast to the previous case, where policymakers cared about the exchange-rate regime only because of its effect on the costs and benefits associated with alternative fiscal policies, here the policymaker is assumed to have preferences over both fiscal outcomes and the exchange-rate regime.

Formally, if one could condition on this omitted variable, the correlation between the exchange regime and fiscal policy should be zero. If the shock to this underlying variable is temporary, then our use of the lagged value of the exchange-rate dummy variable as an instrument in specification 2 would take care of the problem.²⁷ But if shocks to this unobserved variable are persistent, the lagged exchange rate would not be a valid instrument and this procedure would be of no help.²⁸ We do not have much to say regarding this argument; we do not even attempt to instru-

27. Of course, one would also have to assume that there are large costs in changing the exchange-rate regime, so that even if the shock to preferences is temporary, the country stays in that regime unless its costs outweigh the costs of changing the regime. Effectively, this makes the lagged exchange-rate-regime dummy variable an instrument for the current exchange-rate regime. A slightly different interpretation is that we are measuring the average fiscal outcomes corresponding to entering each period with a given exchange-rate regime.

28. We should perhaps reiterate that all of our empirical work has included fixed effects for countries, so that completely permanent "shocks," which would only affect cross-country comparisons, are not an issue here.

ment the exchange regime in this scenario, mainly because, in the absence of a realistic story about what the omitted variable is and how it influences fiscal policy and the choice of exchange-rate regime, it is hard to come up with a list of potential instruments. Having said this, it seems to us that the very difficulty of coming up with such a story casts some doubt on the empirical significance of the logical possibility.

If we suppose for the sake of argument that the exchange-rate regime exerts a causal influence, one way or the other, on fiscal discipline, there is an issue of timing that renders our results on the long-run correlation between the exchange-rate regime and fiscal outcomes potentially misleading. Suppose, for example, that fixed exchange rates promote fiscal discipline, and for that reason tend to be chosen when the fiscal situation is bad. Suppose also that it generally takes time for the fiscal situation to be brought under control. In such a world, fixed exchange rates might be associated with high fiscal deficits, despite the fact that they promote fiscal discipline, simply because they tend to inherit a particularly large fiscal imbalance. At the same time, flexible regimes could be empirically associated with low fiscal deficits simply because they inherit low deficits left over from the preceding period of fixed exchange rates.²⁹

This is where evidence on timing can shed important light. If fixed exchange rates impose fiscal discipline, we should observe an improvement in fiscal outcomes immediately after the adoption of a peg. Similarly, if flexible exchange rates promote less fiscal discipline, we should observe a worsening of the fiscal outcomes immediately after a switch to flexible exchange rates.

Before looking at the data, a caveat is in order. In our data set there are few changes of exchange regime: 21 changes from fixed to flexible, and 11 switches from flexible to fixed. Of the 21 switches from fixed to flexible rates, 7 represented a return to fixed exchange rates after a very brief (one year) experience with flexible rates. Of the 11 switches from flexible to fixed rates, 7 represent the return to fixed exchange rates described above, 2 others were reversed after a year, and 1 was too

29. While we think it is important to address this potential concern, we do not think that it should be taken too seriously. The story requires that the typical duration of an exchange-rate peg be sufficiently short that the correlation between fiscal outcomes and the exchange rate regime is dominated by the transition dynamics described here, rather than the long-run relationship between the regime and fiscal discipline. This is not the case; although exchange-rate switches are substantially more frequent than in the industrial countries, they are fairly rare events. Also, the regressions reported as specification 2 of Table 14 control for the initial fiscal balance, reducing the likelihood that these timing issues are seriously distorting the results.

Table 15 MACROECONOMIC OUTCOMES AROUND THE TIME OF EXCHANGE-RATE REGIME SWITCHES

	Coefficient		
	Real GDP growth	Inflation	% change, real exchange rate
<i>Fixed to flexible</i>			
1 year before	.004 (0.33)	.165 (1.34)	-.149 (-1.29)
Year of the switch	-0.34 (-2.76)	.449 (3.38)	.342 (2.92)
1 year after	-.016 (-1.28)	.092 (0.72)	-.042 (-0.36)
2 years after	-.000 (-0.04)	.037 (0.35)	-.000 (-0.00)
<i>Flexible to fixed</i>			
1 year before	.012 (0.72)	-.052 (-0.30)	-.198 (-1.18)
Year of the switch	.023 (1.30)	-.003 (-0.01)	.142 (0.84)
1 year after	.008 (0.49)	-.244 (-1.38)	-.109 (-0.66)
2 years after	.030 (1.99)	-.104 (-0.73)	.090 (0.56)
Degrees of freedom	319	307	319
Adjusted R ²	.082	.556	-.071

Specifications are described in the text. *t*-Statistics are given in parentheses. Country dummy variables are included in all regressions, and estimates correct for first-order autocorrelation of the error terms.

recent to offer much evidence on postswitch outcomes. This limited experience means that the data are unlikely to speak with crystal clarity, especially on the switch from flexible to fixed exchange rates.

We begin in Table 15 with a summary of macroeconomic developments just before and after the switches. The estimates in the table were constructed by regressing the dependent variable on country dummy variables and leads and lags of a dummy variable that takes the value one in years when there was a switch between exchange-rate regimes.

Switches from fixed to flexible exchange rates look very much like

crises. They are associated with higher than normal inflation, a large (35%) depreciation of the real exchange rate, and a rate of GDP growth which is nearly 3.5 percentage points below normal, and these effects are statistically very significant. Note also that after the switch from fixed to flexible exchange rates output growth remains depressed, although the coefficient is not estimated very precisely. Switches from fixed to flexible exchange rates are another thing altogether; around the time of the switch, real GDP growth changes very little; if anything, the point estimates suggest a better than average performance in the year of the switch and, especially, after the switch. Not surprisingly, inflation falls somewhat after the adoption of the new regime, although once again the coefficients are not precisely estimated.

To summarize this evidence on the macroeconomic developments around exchange-rate regime switches, on average the adoption of a flexible exchange rate regime displays all the signs of the typical crisis accompanying the abandonment of fixed-exchange-rate regimes. Supporting this view is the finding (not reported in Table 15) that the use of IMF credit (as a share of exports of goods and services) rises significantly during the year of the switch and in the subsequent year. On the other hand, switches to fixed exchange rates appear to be less traumatic events. The evidence also helps dispel the notion that a worse fiscal performance after a switch to a fixed-exchange-rate regime could be largely explained by worse macroeconomic conditions.

Armed with this preliminary evidence, we now turn to a more formal analysis of fiscal developments around the exchange-rate regime switches. We constructed dummy variables for years just before and just after the switch of the regime, but set them equal to 1 only if the exchange-rate regime had not reverted to the original regime. We then regressed the change in the overall surplus, total expenditure, and total revenues (all measured as shares of GDP) on these regime-switch dummy variables. In the regression we also controlled for the lagged fiscal balance, GDP growth in good and bad times, the rate of growth of the terms of trade, and country fixed effects. (Conditioning on GDP growth is particularly important because of the very different behavior of GDP growth around the two types of switches that we have documented above.) Hence, in principle we are isolating the “discretionary” change in fiscal policy typically associated with changes in the exchange-rate regime.

We find (Table 16) that switches from fixed- to flexible-exchange-rate regimes tend to be preceded by a period of high fiscal deficits, and in particular by higher than normal public expenditure. During the year of the switch and in subsequent years, there is a substantial movement

Table 16 FISCAL OUTCOMES AROUND THE TIME OF EXCHANGE-RATE REGIME SWITCHES

	<i>Coefficient</i>		
	Overall surplus	Revenue and grants	Total expenditure
<i>Fixed to flexible</i>			
1 year before	-.017 (-2.19)	.004 (0.58)	.020 (2.53)
Year of the switch	.012 (1.51)	.010 (1.46)	-.002 (-0.19)
1 year after	.021 (2.43)	.005 (0.67)	-.016 (-1.89)
2 years after	.010 (1.30)	.001 (0.08)	-.003 (-0.43)
<i>Flexible to fixed</i>			
1 year before	.011 (0.90)	.002 (0.20)	-.011 (-0.86)
Year of the switch	.023 (1.97)	.007 (0.73)	-.012 (-1.04)
1 year after	.020 (1.82)	.007 (0.76)	-.012 (-1.09)
2 years after	.010 (0.76)	-.017 (-1.53)	-.025 (-1.92)
Degrees of freedom	224	225	224
Adjusted R ²	.133	-.008	.009

General government, percentage of GDP. Specifications are described in the text. *t*-Statistics are given in parentheses. Country dummy variables are included in all regressions, and estimates correct for first-order autocorrelation of the error terms.

towards fiscal surplus, amounting to nearly 4% of GDP. This is also driven primarily by changes in expenditure.³⁰

This evidence seems at first glance to be reasonably good news for the idea that flexible exchange rates promote greater fiscal discipline in Latin America, perhaps through mechanisms such as the ones described by Tornell and Velasco (1995). Still, we interpret it with caution, for several

30. We see that periods during which fixed-exchange-rate regimes are abandoned tend to be associated with economic contraction and fiscal expansions. It is interesting to know whether these episodes are driving the results on the procyclicality of fiscal policy that were discussed above. It turns out that they are not; if we exclude periods during which the exchange regime was switched from the regressions summarized in Table 8, the point estimates of the coefficient on output growth are essentially unchanged.

reasons. First, a switch to flexible exchange rates is likely to be part of a package of policies that may very well include a fiscal consolidation, even if there is no causal relationship between the two. In addition, as we noted above, switches to flexible exchange rates tend to occur in the context of a macroeconomic and financial crisis in which policymakers may be forced into a fiscal adjustment by curtailed access to credit. The fiscal consolidation that tends to follow a switch to flexible exchange rates may thus have much more to do with unobserved elements of the short-term macroeconomic situation than with longer-lasting political-economic factors. Finally, we also find that a similar pattern emerges after the switch from flexible to fixed exchange rates. In this case the fiscal surplus also tends to be relatively high in the year of the switch and the year immediately following it, though it does not increase by much compared with the surplus observed in the year before the switch. This is consistent with the idea that alterations in the exchange-rate regime, in either direction, are part of a policy package that tends to include some fiscal consolidation.

Still, we have made progress. Notice that there is no evidence that fixed-exchange-rate regimes inherit a particularly bad fiscal situation from the preceding flexible-exchange-rate regime: the coefficient of the dummy variable one year before the switch to fixed exchange rates is positive, although not statistically different from zero. Similarly, there is no evidence that the negative long-run correlation between flexible exchange rates and fiscal deficits is due to the fact that they tend to start from a healthy fiscal stance; the coefficient of the switch dummy variable one year before the shift to flexible rates is negative, and statistically significant. We can also reject the notion that fiscal outcomes are more stringent under flexible-exchange-rate regimes only because the underlying economic environment is more favorable, since we have tried to partial out the effect of the economic environment on fiscal outcomes. Combined with the strong empirical association between fixed exchange rates and fiscal laxity that we have documented above, these findings would seem to shift the burden of the proof toward advocates of the view that fixed exchange rates promote fiscal discipline.

5.3 FISCAL POLICY AND THE DEMISE OF FIXED-EXCHANGE-RATE REGIMES

We have presented evidence that in Latin America, though not in the industrial economies, fixed-exchange-rate regimes are associated with larger fiscal deficits than are flexible regimes. Regardless of the story that one prefers about causality, this association poses a puzzle; fixed exchange rates imply lower inflation and therefore lower inflation tax col-

lection,³¹ and the combination of larger fiscal deficits and lower inflation taxes does not add up. What gives?

What gives, of course, is the fixed-exchange-rate regime. We have found that in Latin America the end of fixed-exchange-rate regimes tend to be preceded by a major fiscal expansion, and accompanied by signs of a major economic and financial crisis.³² One interpretation of these findings is that loose fiscal policy is an important contributor to the collapse of fixed-exchange-rate regimes.³³ In this section we develop this idea further. Our main finding is that fiscal policy is a robust predictor of the abandonment of fixed-exchange regimes, though other domestic and external factors are also important. This is noteworthy because several recent studies have either failed to test for the impact of fiscal variables, or failed to uncover evidence that they are an important factor in currency or financial crises.

To explore this, we estimated the empirical relationship between the probability of a switch from fixed to flexible exchange rates and a number of explanatory variables, including (1) measures of the fiscal stance in the previous period; (2) the three-year rate of change in the terms of trade, also lagged one year, (3) the three-year rate of growth of real GDP, lagged one year; (4) the three-year rate of growth in the real exchange rate, lagged one year; and (5) the exchange-rate regime, lagged two years. Estimation is by probit,³⁴ and the sample is of course restricted to those observations for which the previous year's exchange rate was fixed.³⁵

31. Except in those atypical cases in which the economy is on the wrong side of the inflation-tax Laffer curve. Ghosh et. al. (1997) also report that inflation tends to be lower under fixed- than under flexible-exchange-rate regimes.
32. In a panel study of macroeconomic volatility in about 100 countries, Gavin and Hausmann (1996) also find that frequent switches among exchange-rate regimes are associated with increased macroeconomic volatility.
33. Note that, having explored the potential impact of exchange regimes on fiscal outcomes, we now explore the impact of fiscal outcomes on (changes in) exchange regime. We are essentially relying upon timing considerations for identification, assuming that lagged fiscal policy is causally related to the sustainability of the exchange-rate regime, but that the future exchange-rate regime does not affect current fiscal outcomes. We think this is the most sensible (and conventional) interpretation of the data. [See for example Krugman (1979); related empirical literature that focuses on developing economies includes Frankel and Rose (1996), Klein and Marion (1994), and Sachs, Tornell, and Velasco (1996).] But we recognize the logical possibility (discussed above) that the exchange-rate regime and fiscal policy are related to an unobserved common factor which leads to changes in fiscal policy accompanied by a (subsequent) change in the exchange regime.
34. Essentially identical results were obtained when estimation was by logit and a linear specification. The linear specification allowed us to introduce country dummy variables (with which the probit and logit estimates would not converge). These country dummy variables generally strengthened the results that we describe here. The major difference was an increase in the statistical significance of the election variable.
35. The probability of a switch from fixed to flexible exchange rates is, by definition, zero if the country started out with flexible exchange rates.

Table 17 EXPLAINING TRANSITIONS FROM FIXED TO FLEXIBLE EXCHANGE RATES

	<i>Coefficient</i>				
	Overall surplus	Total revenue	Total expenditure	Capital expenditure	Public consumption
Fiscal variable	-7.80 (-2.03)	0.590 (0.40)	2.306 (1.76)	0.322 (0.61)	3.352 (2.03)
Election	0.996 (1.74)	0.788 (1.43)	0.995 (1.72)	0.743 (1.35)	0.792 (1.34)
3-year terms of trade growth	-3.61 (-1.91)	-3.173 (-1.77)	-2.789 (-1.62)	-3.236 (-1.79)	-3.23 (-1.79)
3-year real GDP growth	1.910 (0.42)	-1.210 (-0.27)	-1.87 (-0.42)	-2.144 (-0.48)	-5.132 (-1.07)
3-year real exchange rate growth	-2.235 (-1.42)	-2.200 (-1.47)	-2.13 (-1.38)	-2.405 (-1.58)	-2.368 (-1.54)
Exchange regime, lagged 2 years	-0.231 (-0.43)	-0.163 (-0.27)	-0.218 (-0.38)	-0.387 (-0.63)	-0.227 (-0.37)
Degrees of freedom	116	104	109	100	100
Cases correct	108	95	101	93	93

Dependent variable is equal to one if the country switched from fixed to flexible exchange rates during the period and zero otherwise. Sample is restricted to observations for which the exchange rate was fixed in the preceding year. Estimation is by probit, and all explanatory variables are lagged one period. Fiscal data refer to general government, and are measured as a share of GDP.

Table 17 summarizes the results. In the first column we see that large fiscal deficits are associated with a significantly higher probability of switch from fixed to flexible exchange rates; indeed, the fiscal balance (and government consumption booms) is the variable with the closest statistical relationship to regime switch, as measured by the *t*-statistic. This finding contrasts with Frankel and Rose (1996), who find no evidence that large budget deficits are associated with a higher probability of currency crash. Sachs, Tornell, and Velasco (1996) similarly fail to uncover evidence that loose fiscal policies increase macroeconomic vulnerability.³⁶ We also find strong evidence that adverse external shocks, in the form of declines in the terms of trade, increase the probability of exchange regime switches. The evidence also suggests, though not with

36. The studies differed in many ways, most notably in the definition of a "crash." Frankel and Rose identify a crash as "a large depreciation which is also a substantial increase in the rate of change of nominal depreciation." It is thus a broader concept of financial crisis than our focus on exchange-rate-regime collapse. Sachs, Tornell, and Velasco study determinants of the impact of the Mexican "tequila" shock on a number of emerging market economies, as measured by a weighted average of the percentage loss of international reserves and the rate of depreciation against the U.S. dollar.

a high degree of statistical significance, that the switches tend to occur after elections, and after large exchange-rate appreciations.³⁷ The association between elections and changes in the exchange-rate regime supports the idea, discussed above, that the revision of the regime is associated with a policy reform package.

While the overall fiscal surplus is significantly related to regime switches, the association appears to be due primarily to public spending booms, rather than fluctuations in fiscal revenue. Interestingly, fluctuations in capital spending are not associated with regime switches, while public consumption booms are. One interpretation of this finding is that public investment is viewed by market participants as productive, so that only booms in government consumption (and other forms of current expenditure) contribute to insolvency. However, in light of the measurement errors that surround this component of fiscal outcomes, we would not want to push this interpretation very hard.

We have not provided estimates for the industrial economies, because the results are easy to summarize. While we found some evidence that a three-year period of low GDP growth is associated with switches from fixed to flexible exchange rates, none of the fiscal or other variables had any explanatory power. In sharp contrast with Latin America, fiscal and external shocks seem to be much less closely related to the decision to switch from pegged exchange rates.

6. *Conclusion*

Our main purpose in this paper was to lay out a body of stylized facts about fiscal policy in Latin America and put forward some tentative interpretations. We have found that in a number of dimensions the fiscal outcomes differ qualitatively from what is observed in industrial countries. We have found that fiscal policy is procyclical, and particularly so in periods of low growth, when policy is in particularly countercyclical in the industrial economies. This procyclicality may have to do with the voracity effects associated with political distortions that have been the focus of several recent theoretical papers, and the Latin American experience may help to discriminate among the various theoretical models.

We have also suggested that the procyclicality of fiscal policy in Latin America has to do with a loss during macroeconomic bad times of the

37. Klein and Marion (1994) also find that exchange-rate pegs tend to be abandoned after large appreciations. They do not explore the role of fiscal policy. Dornbusch, Goldfajn, and Valdés (1995) also emphasize the role of exchange-rate appreciation in bringing down fixed-exchange-rate regimes.

market access that would be required to support a more countercyclical fiscal policy. This is consistent with the fact that access to emergency credit is higher during bad times, and it also helps explain why fiscal policy is particularly procyclical in bad times, the cyclical behavior of inflation, and why policy is particularly procyclical for countries that enter a period with high deficits.

But a number of further questions arise. Why is Latin America apparently more afflicted by these problems than are the industrial economies? After all, it is far from obvious that interest-group politics are more highly developed in Latin America than in the industrial economies. A number of potential explanations, with different implications for policy, come to mind, including for example differences in income distribution (Perotti, 1996b) and the volatility of the underlying macroeconomic environment (Talvi and Végh, 1996; Aizenman, Gavin, and Hausmann, 1996). We hope that the database that has been developed for this paper will create opportunities to better discriminate among these and other potential explanations.

We also found very little evidence to support the idea that fixed-exchange-rate regimes promote fiscal discipline, and some evidence for the opposite conclusion. At the same time, the evidence strongly suggests that fiscal expansions have been an important factor behind the collapse of fixed-exchange-rate regimes in Latin America.

Appendix. Data

In this appendix, we outline the methodology we have followed in assembling our database and list our sources for each country. Our basic source for the central-government data is the IMF Government Finance Statistics (GFS). The obvious advantage of this source is that it follows a consistent definition of the various items, both in terms of the breakdown of expenditures and revenues, and in terms of the reporting basis, which is always cash. The two exceptions are Peru, for which the source we used goes back further than GFS but is identical to GFS for the years they overlap, and Ecuador, for which the coverage of the central government in GFS is very spotty.

For virtually every country, we supplemented the electronic version of GFS, which has many gaps, with the printed version. We also used the printed version to check the coverage of the central government every year. When the coverage changed, in some cases we were able to reconstruct a consistent and unbroken coverage using the appropriate issues of GFS. When even this failed, we used unpublished IMF data whenever possible, and after that, World Bank data. These data have the same

primary sources and organization as the GFS data. As a result, all the breaks in coverage we have are minimal and concern a few small agencies every time. Costa Rica is a partial exception, as we have not yet been able to incorporate decentralized agencies before 1987.

In some cases, data were not available from GFS, particularly at the beginning and/or the end of our sample period. In these cases, we first used other IMF or World Bank data when available, with the same format and definitions as the data we supplemented. In any case, we always made sure that GFS and the supplementary source gave the same figures (up to very small discrepancies) for the years of overlap. When we were forced to use non-IMF sources, we accepted them only if the discrepancies over two consecutive overlapping years were minimal. In most cases, the non-IMF sources are the same original sources listed in the GFS publication as the primary source of the GFS data.

We included in our definition of local governments state, provincial, regional, and municipal governments. GFS reports data for local governments mostly in its printed version, and at most over the 1975–1990 period. However, in the case of local governments we had to resort to other IMF sources and to non-IMF sources more often than for the central government. In assembling these sources, we followed the same criteria outlined above for the central government. In addition, we always made sure that for each country the coverage of local governments remains constant over the whole sample. We have also striven to net out intergovernmental flows between different levels of local governments, although this type of information is very scarce outside the federal countries. One should keep in mind, though, that outside the federal countries most of the intergovernmental flows occur between the central government and all the other levels of government, and we do have and use this information.

GFS does not report data for nonfinancial public enterprises. For these, we used IMF sources when available (most of the time) and then the other sources listed below.

We now provide a detailed list of our sources by country, for the central government (CG), local governments (LG), and nonfinancial public enterprises (NFPEs), as well as a few notes when needed.

Argentina. CG: 1970–1986, GFS; 1987–1994, IMF. LG: 1970–1986, GFS; 1987–1994, IMF. NFPE: World Bank. Notes: (1) LG does not include municipalities and seminational health funds (*Obras Fomientos*). These two sectors are not required to have budgets. (2) NFPEs do not include provincial public enterprises (mostly public utilities) unless they are incorporated in provincial accounts.

Bolivia. CG: 1970–1994, GFS. Social security and decentralized agencies: 1970–1983, World Bank. “Other accounts”: 1970–1983, IMF. LG: 1974–1979, World Bank; 1980–1994, GFS. NFPEs: 1974–1979, World Bank; 1980–1994, IMF. Notes: (1) For 1970–1983, GFS does not have data on social security and decentralized agencies and on “other accounts”; we used World Bank data for social security and decentralized agencies, and IMF data for “other accounts”; data on Central Administration for 1970–1983 in these sources are identical to the GFS data.

Brazil. CG: 1970–1992, GFS. LG: 1970–1976, IMF; 1977–1992, GFS. NFPEs: 1980–1994, IMF. Notes: (1) Total revenues are subject to large cash adjustment in certain years. Hence, in those years total tax revenues are different from the sum of individual tax revenues. (2) NFPEs do not include municipal enterprises.

Chile. CG: 1972–1994, GFS. LG: 1974–1988, GFS; 1989–1994, *Informe Gestión Financiera del Estado*, Contraloría General de la República, various issues. NFPEs: CODELCO, 1974–1994, IMF; other NFPEs, excluding CODELCO, 1974–1986, IMF; 1987–1994, *Estadísticas de las Finanzas Públicas 1989–95*, Ministerio de Hacienda, Dirección de Presupuesto. Notes: (1) For a few CG items between 1989 and 1994, we used *Estadísticas de las Finanzas Públicas 1989–95*, Ministerio de Hacienda, Dirección de Presupuesto.

Colombia. CG: 1974–1978, World Bank for revenues, GFS for expenditures; 1979–1988, GFS; 1989–1995, IMF. LG: 1974–1979, World Bank; 1980–1991, GFS; 1992–1995, IMF. NFPEs: 1974–1980, World Bank; 1981–1995, IMF.

Costa Rica. CG: 1973–1994, GFS. LG: 1972–1984, GFS; 1985–1994, *Memoria Anual*, Contraloría General de la República. NFPEs: IMF. Notes: (1) Central government does not include decentralized agencies before 1987.

Ecuador. CG: 1972–1995, *Cuentas Nacionales de Ecuador*, Banco Central del Ecuador. LG: 1972–1995, *Cuentas Nacionales de Ecuador*, Banco Central del Ecuador. NFPEs: 1972–1995, *Cuentas Nacionales de Ecuador*, Banco Central del Ecuador. Notes: (1) These are national income account data, not budget data. (2) As a measure of intergovernmental transfers from CG to LG, we used transfers to LG from FONAPAR (Fondo Nacional de Participación), from IMF.

México. CG: 1970–1990, GFS; 1991–1995, IMF. LG: 1972–1982, GFS; 1983–1994, *Estadísticas de Finanzas Públicas Estadales y Municipales*, INEGI, various issues. NFPEs: 1971–1986, *Informe del Gobierno*, various issues; 1987–1995, IMF. Notes: (1) State finances include the accounts of the Federal District. (2) Individual tax revenues are gross of tax

certificate credits, which are netted out only from total tax revenues; therefore, in some years total tax revenues are different from the sum of individual taxes.

- Panamá.* CG: 1973–1993, GFS. LG: 1973–1993, *Estadísticas Panamena, Situación Económica, Hacienda Pública y Finanzas*, Contraloría General, various issues. NFPEs: 1973–1993, *Estadísticas Panamena, Situación Económica, Hacienda Pública y Finanzas*, Contraloría General, various issues.
- Paraguay.* CG: 1972–1993, GFS; 1994–1995, IMF. LG: 1970–1988, IMF; 1989–1994, Juan Alberto Neffa, *Decentralización Fiscal: El Caso Paraguayo*, CEPAL/GTZ, Santiago del Chile, 1996. NFPEs: IMF. Notes: (1) In 1989–1993, GFS stopped reporting data for social security and decentralized agencies; we supplemented GFS using IMF data. (2) Our source for LG 1989–1994 has the same primary source as the IMF data that we use for 1970–1988, namely the Ministerio de Hacienda, Secretaría Técnica de Planificación.
- Perú.* CG: 1968–1994, *Perú en Números*. LG: 1968–1994, *Perú en Números*. NFPEs: 1968–1994, *Perú en Números*. Notes: (1) CG identical to GFS after 1980; before 1980, slight discrepancy due to break in coverage in GFS.
- Uruguay.* CG: 1970–1994, GFS. LG: 1974–1994, IMF. NFPEs: 1974–1994, Banco Central de Uruguay. Notes: (1) LG covers the municipality of Montevideo only.
- Venezuela.* CG: 1970–1994, GFS. LG: 1970–1979, *Informe Económico*, Banco Central de Venezuela; 1980–1986, IMF; 1987–1994, *Anuario de Cuentas Nacionales*, Banco Central de Venezuela, various issues. NFPEs: 1970–1994, IMF. Notes: (1) After 1986, revenues of decentralized agencies are not covered in the CG accounts. However, these revenues represent only about 2% of total revenues. (2) Data on LG after 1986 from *Anuario de Cuentas Nacionales* are from national income accounts. We checked the robustness of our results by excluding them from our sample. (3) Data from *Informe Económico* are identical to GFS data in overlapping years.

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Comment

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1. Introduction

Empirical work on Latin American macroeconomics has almost exclusively focused on monetary policy and inflation. Researchers have certainly seen fiscal deficits as a major underlying determinant of high inflation, but have rarely studied fiscal policy in its own right. The topic of this paper is thus highly welcome. I find the paper thought-provoking and carefully crafted. Gavin and Perotti have really done the profession a great service by putting together a comprehensive dataset that others are likely to use in the years to come. This is a fine contribution, but having praised it, it is hard for a discussant to say much more about it.

After an account of some basic facts of Latin American fiscal policy in the last twenty-five years, against the backdrop of corresponding data for the industrialized countries, most of the paper revolves around two stylized facts: (1) Latin American fiscal policy is highly procyclical, compared to the industrial countries, and (2) fixed exchange rates seem to provide little fiscal discipline in Latin America. While the paper documents these facts in great detail, it is perhaps somewhat less successful in taking the next natural step, addressing follow-up questions like: How do we explain these facts? What should we make of the stark fiscal policy differences between Latin America and the OECD?

In the following, I first discuss the explanations for procyclical fiscal policy suggested by the authors. I then suggest another, alternative explanation. Finally, I make a few brief remarks on the link between fiscal discipline and the exchange-rate regime.

2. *Procyclical Fiscal Policy: The Authors' Interpretations*

The authors convincingly demonstrate that the fiscal surplus behaves very differently in Latin American countries than in the industrial countries. In the latter, government spending is on average acyclical and taxes strongly procyclical, implying that the fiscal surplus is positively correlated with GDP growth: controlling for some other determinants of the surplus, the elasticity of the surplus—measured as a share of GDP—with regard to GDP growth is about 0.37 (see Gavin and Perotti's Table 8). In Latin America, instead, the corresponding elasticity is estimated at 0.04 and insignificantly different from zero. The reason is not so much different behavior of revenues. Rather, government spending falls drastically in recessions; the procyclical pattern of spending is, indeed, particularly marked in severe recessions. While neoclassical tax-smoothing theory could explain this pattern if GDP shocks were more persistent in Latin America, Gavin and Perotti show this not to be the case. So one has to seek an explanation elsewhere. The paper suggests three candidates: (1) *reverse Keynesian causation*, whereby misguided discretionary policy causes recessions; (2) *voracity effects*, whereby government spending becomes positively correlated with available revenue for political-economy reasons; (3) *international credit constraints*, whereby lack of credit constrains government spending in recessions.

How could we discriminate among suggested explanations? A preferred approach would be to derive the procyclical property from a theoretical model and then check whether the model's auxiliary predictions for other macroeconomic variables also hold up. This is not the approach the authors take; they instead rely on an informal discussion. To illustrate what I mean, let me take two other salient facts that may be helpful in discriminating between different explanations. First, the volatility (standard deviation) of private consumption and GDP are about the same in the OECD, whereas the volatility of private consumption is clearly higher than the volatility of GDP in Latin America (the volatility of GDP itself is also much higher in Latin America than in the OECD). Second, as Gavin and Perotti emphasize, inflation is negatively correlated with GDP growth in the OECD, whereas the correlation is positive in Latin America.

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1. *Reverse Keynesian causation.* The reverse Keynesian story seems hard to reconcile with the aforementioned additional facts. If misguided policy-induced demand shocks were a major cause of recessions, then we should presumably observe less private-consumption volatility and a positive correlation between inflation and GDP in Latin America, and not the reverse.
 2. *Voracity effects.* Talvi and Végh (1996) suggest how a conventional optimal taxation model, extended with a (reduced form) positive relation between government spending and revenue, may explain procyclical fiscal policy. The positive relation arises because a weak government may be in the hands of pressure groups that demand more spending when the government revenue is plentiful (ultimately there must be some asymmetric information for this story to make sense).¹ Operating under this additional constraint, the government finds it optimal to depart from the conventional tax smoothing solution, and meet a positive shock to the tax *base* by drawing down tax *rates* on labor and money. An outside observer would thus see high GDP growth associated with higher than normal government spending and lower than normal inflation; an induced effect may well be higher volatility of private consumption. This story may thus be consistent with the auxiliary facts above.
 3. *International credit constraints.* Gavin and Perotti do present some independent evidence that international credit constraints may have been particularly severe in Latin American recessions. Is the credit-constraint story also consistent with the auxiliary facts? Suppose—as is reasonable—that credit constraints have been equally (or more) severe for private agents, and that a credit-constrained government uses the inflation tax as a last-resort source of revenue. Under these assumptions, the facts may indeed be consistent with international creditors pulling out in (exogenously) bad times. That this explanation may hold water is quite sensible. After all, the debt crisis of the 1980s is part of the authors' panel dataset.

The surviving interpretations (2) and (3) need not, of course, be substitutes. And Keynesian effects, if not the main cause of procyclical fiscal policy, may well have amplified initial shocks.

1. In addition to the papers mentioned by Gavin and Perotti, Svensson (1996) suggests a model which also implies procyclical government spending: cooperation between a number of interest groups, drawing rents from a weak government, temporarily breaks down after a positive shock to government revenue, causing a temporary burst of government spending. The main argument in Becker and Mulligan (1996)—although the paper deals with a different topic—can also be understood as additional government revenue getting spent for political-economy reasons.

A natural question, which the authors don't pose, is exactly what conclusions one may draw from the different fiscal behavior in Latin America and the OECD. Does it mean that these groups of countries are inherently different? It seems to me that the authors' results are consistent with a different answer. If mechanisms (2) and (3) are operating in Latin America, they could very well be latent in the OECD countries as well. But as macroeconomic developments have not been nearly as volatile in the OECD, we don't see any significant manifestations of voracity effects or international credit constraints in more recent data. It would indeed be interesting to go back to more volatile historical periods—such as the interwar period—and look for signs of procyclical fiscal policy in the industrialized countries. An additional observation in line with this argument is the case of Colombia: GDP volatility in that country is similar to that of Germany, Italy, or Japan over the sample period. And the correlation between government spending and GDP in Colombia has, indeed, also been of the same magnitude as in these industrialized countries (see Talvi and Végh, 1996).

3. Procyclical Fiscal Policy: An Alternative Interpretation

When discussing the paper in the conference, I argued that an alternative mechanism might help explain the different cyclical properties of the fiscal surplus across Latin America and the OECD. The argument was that inflation, and not discretionary fiscal measures, might be the explanation. Four preliminary observations indicate why this might be the case: (1) With important components of government budgets non-indexed, both on the expenditure and on the revenue side, inflation may substantially improve fiscal outcomes. In their case study of Sweden, Persson, Persson, and Svensson (1996) estimate such indirect budget effects to be quantitatively much more important than the inflationary channels emphasized in the theoretical literature (dilution of the real value of money and outstanding government debt). (2) As stated in Gavin and Perotti's paper (and the previous section), inflation is procyclical in the OECD, but countercyclical in Latin America. Indeed, inflation tends to be particularly high in severe recessions, when government surpluses are also high. (3) Volatility of inflation is much higher in Latin America than in the OECD. (4) Colombia, the only Latin American country with an acyclical fiscal surplus, indeed has a positive, rather than negative, correlation between inflation and GDP.²

2. The data backing up the empirical statements in this section are all taken from Talvi and Végh (1996).

In the revised version of the paper Gavin and Perotti do make an attempt to address this hypothesis. Their procedure is to add a measure of inflationary surprises—obtained as the residual of a regression of the inflation rate on lagged inflation rates, lagged deficits, terms-of-trade changes, and country fixed effects—to their estimated relation between the fiscal surplus and GDP growth. And they find that inflationary surprises are unimportant for this relation. I am not convinced, however, that this really addresses the problem. The reason is that almost all the effects discussed by Persson, Persson, and Svensson will be triggered by unanticipated and anticipated inflation alike: it is realized inflation that will dilute the real value of, say, nonindexed pensions. If the argument is that anticipated inflation will be compensated for ahead of time by discretionary measures that keep the real value of fiscal commitments constant, I still do not see why only unanticipated inflation matters. For if such *ex ante* compensation takes place, then anticipated inflation does not affect the fiscal surplus (measured as a share of GDP). But that is an issue that could be settled empirically.³

I will therefore reiterate my claim that inflation—anticipated or unanticipated—is a potential omitted variable in the authors' regressions. I will also claim that the resulting bias in the estimates of the effect of the cycle on the fiscal surplus may be quantitatively significant. To see why, suppose the fiscal surplus as a share of GDP, s , is truly determined by GDP growth, Δy , and inflation, π , according to model 1:

$$s = \alpha_1 + \beta_1 \Delta y + \gamma \pi + \epsilon_1.$$

The researcher, however, estimates model 2:

$$s = \alpha_2 + \beta_2 \Delta y + \epsilon_2.$$

The expected omitted-variable bias from such a procedure can be estimated as

$$\hat{B} = E(\beta_1 - \beta_2) = \gamma \rho(\Delta y, \pi) \frac{\sigma_\pi}{\sigma_{\Delta y}},$$

3. Of course, one needs to worry about simultaneity. But that could be handled by instrumental-variable estimation. I would have been much happier if the authors had checked the robustness of the estimated effects of the cycle on the fiscal surplus, not using the residuals from the inflation equation described in footnote 17, but rather the fitted values from this equation.

where $\rho(\Delta y, \pi)$ denotes the correlation coefficient between π and Δy , and where the fraction is the relative standard deviation of these two variables. The results in Persson, Persson, and Svensson (1996) suggest that a value of γ of about 0.3 is appropriate for Sweden (10% higher inflation improves the fiscal surplus by about 3% of GDP). Using this value and empirical values over the sample period for the other terms in the expression, we find that \hat{B} for Latin America is negative and equal to -0.23 , whereas \hat{B} for the OECD is positive and equal to 0.06 . Omitting the dependence of the fiscal surplus on inflation may thus bias the estimated coefficients β_2 towards a difference on the order of 0.3. This number corresponds pretty closely—and with the right sign—to the difference in the regression coefficients of the surplus on GDP growth that Gavin and Perotti report in Table 8.

Of course, the above argument is just the kind of “quick and dirty job” you might get away with as a discussant pressed for time—the regression underlying Table 8 is not a simple regression, so the formula for bias is more complicated; the data I fished out of Talvi and Végh’s paper are not exactly the same as those used by Gavin and Perotti; I did not run the right (model 1 type) regressions myself, and so on. But I believe that the argument is convincing enough to warrant a further investigation into whether and to what extent the different cyclical behavior of the surplus is due to the different cyclical behavior of inflation. What difference does it make if this is the case? A lot. For if inflation is really the culprit, then we are back to square one, namely to monetary policy—the traditional topic in Latin American macroeconomic policy.

4. *Fiscal Discipline and Fixed Exchange Rates*

The results in Section 5 of the paper tell us a great deal about the average conditions under which Latin American stabilization programs with exchange-rate pegs as an active ingredient were implemented in the last twenty-five years. But the authors also suggest that the results tell us something about a larger question, challenging conventional wisdom that fixed exchange rates provide more fiscal discipline. I would just like to make the point that the larger question is quite ill posed and that the conventional wisdom, challenged or not, is too unspecific to be of much guidance. There are two reasons for this.

First, even though the international-finance literature is full of comparisons between “fixed” and “floating” rates, the distinction is too imprecise to be operational. Fixed exchange rates are only one out of many possible intermediate targets for monetary policy (and as such they can have very different consequences depending on the peg: pegging to the

deutsche mark and to the Greek drachma are certainly not the same thing). Floating exchange rates, being the complement to fixed rates, thus span a variety of different operating procedures for monetary policy (most textbooks implicitly assume money-supply targeting to be the alternative).

The second reason why the larger question is ill posed is that commitment to a monetary regime can be more or less well enforced, depending on its institutional underpinnings. Thus "fixed rates" encompass an entire spectrum, ranging from monetary unions or currency boards, through multilateral exchange-rate arrangements with sanctions for transgressions, to unilateral pegs by dependent central banks. Similar distinctions hold for alternative monetary targets. The discipline that is going to be imposed on the fiscal authority—deriving from eventual accommodation or not, by the central bank, of a fiscal expansion, and from financial markets' expectations about accommodation or not—thus crucially depends on the institutional ramification of the monetary regime. To put it in the language of Sargent and Wallace: what matters for fiscal discipline is who is the dominant player in the game between the fiscal and monetary authority. Posing general questions about the fiscal discipline imposed by "fixed exchange rates," without being very specific about the alternative operating procedure and the institutional backing, is therefore much too vague.

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Comment

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The Latin America fiscal database gathered by Gavin and Perotti involved great effort. I am confident it will help establish as stylized facts some puzzling aspects of fiscal policy in developing countries that have been discussed recently in the literature, and it will also help unearth

new puzzles. As a result, new research may be generated which will help us better understand the way fiscal policy is formed in these countries. It is to be hoped that improved design of fiscal institutions and more efficient fiscal policy, from the social point of view, will be the result.

The paper concentrates on the analysis of some of these stylized facts. In this brief discussion, I will describe some mechanisms that link institutional characteristics common to several developing countries to two puzzling regularities of the Latin American database. The two regularities are the procyclicality of fiscal policy and the failure of fixed exchange rates to induce more fiscal discipline than flexible rates.

In Latin America, only a few strong groups have access to fiscal revenue. Private banks and their associated industrial conglomerates, strong unions, state-owned enterprises, and provincial governments can all be included in this select group. Moreover, in many of these countries, there are no strong countervailing institutions to impede discretionary fiscal redistribution. Because each group enjoys *de facto* access to fiscal resources, a "tragedy of the commons" results. Representative-agent models of fiscal policy cannot be used to analyze these economies, because they are not designed to handle such conditions. A more appropriate approach to studying fiscal policy in these developing countries is one where redistribution among groups plays a central role.

To generate procyclical fiscal policy, a positive shock which increases income must produce a more than proportional increase in fiscal spending, even if the shock is expected to be transitory. This can be called the *voracity effect*. It should be clear that representative-agent models are incapable of producing voracity effects in the presence of transitory shocks. How can a model with multiple powerful groups generate voracity? Suppose that the growth rates of output and fiscal revenue are proportional to some productivity parameter. Furthermore, suppose that every group has access to fiscal revenue, but that each group can invest its resources in a truly private way. That is, a group need not consume all the fiscal resources which it appropriates. It can save them with a private technology. If groups do not engage in a fiscal war, where every group appropriates as much fiscal resources as it can, then the equilibrium rate of return that each group receives on its private assets must be equal to the raw rate of return on fiscal assets, minus the appropriation rates of the other $n-1$ groups.

Now suppose that the economy is hit by a shock that increases the raw rate of growth of fiscal assets and income by Z , such as a productivity or terms-of-trade shock. It follows that each group will have the opportunity to appropriate more fiscal resources without inducing a fiscal war.

How much more can each group appropriate? To answer this question, note that from the point of view of group 1, the other $n-1$ groups can increase the sum of their appropriations by Z . In this way, after appropriation by others, the fiscal assets' rate of return will equal the rate of return that group 1 receives from its private assets. The calculation can then be performed for each of the n groups. Therefore, in equilibrium, each group can increase its appropriation by $Z/(n-1)$. This implies that aggregate appropriation increases by $Zn/(n-1)$, which is greater than the original shock. The details of this argument can be found in Lane and Tornell (1997).

The second regularity is the failure of fixed exchange rates to induce more fiscal discipline in Latin America. Contrary to accepted wisdom, Gavin and Perotti's dataset reveals that fiscal deficits tend to be larger under fixed exchange rates than under flexible ones. Furthermore, this cannot be explained by the fact that macroeconomic conditions were worse at the time when fixed rates were adopted.

According to conventional wisdom, fixed rates provide more fiscal discipline because adopting lax fiscal policies must eventually lead to an exhaustion of reserves and a collapse of the peg. This collapse implies an enormous political cost for the policymaker. The fear of this cost imposes discipline on the policymakers. The problem with this argument is that there are also costs under flexible rates; the difference is that the effects of unsound policies manifest themselves immediately through movements in the exchange rate. In order for fixed rates to provide more discipline than flexible rates, one would have to assume that it is politically more costly to devalue under fixed rates than it would be to devalue under flexible rates. However, both theoretically and empirically, it is unclear why this should occur.

Tornell and Velasco (1997) provide empirical evidence that complements the evidence of Gavin and Perotti. They examine the serious stabilization episodes that took place in Latin America from 1960 to 1994. These include 13 exchange-rate programs and 9 money-based programs. After controlling for past fiscal balances, changes in terms of trade, and the U.S. interest rate, they find that the improvement in the primary fiscal balance-to-GDP ratio averages around 2 percentage points higher under money-based programs than under exchange-rate-based programs. This disparity is different from zero at the 1% level of significance. The figure for the nominal balance is also 2 percentage points.

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Discussion

Bennett McCallum asked the authors to elaborate on how they classified countries by exchange-rate regime. More specifically, did they classify a country according to what that country reported to the IMF? Further, were countries with purportedly fixed exchange rates but which devalued frequently classified as fixed-rate countries? McCallum cautioned that the latter question is particularly important if the authors were asking whether a fixed exchange rate serves as a discipline device. Gavin replied that they did use the IMF classifications and argued that these categories do capture some important differences in policy regimes. He agreed, though, that it would be useful to develop a method of classifying exchange-rate regimes more finely.

In response to the author's various explanations of Latin American procyclical fiscal policy, Julio Rotemberg wanted to know how different the borrowing-constraints interpretation was from a standard Keynesian story. In particular, he pointed out that an event that restricts a country's access to international capital markets could be viewed simply as an exogenous shock to the government's ability to spend, which would then have the standard Keynesian effects on output. He argued that in order to tell a different story, one would need to argue that the output movements themselves were the source of the credit constraints. Gavin suggested that Rotemberg's interpretation is not very different from theirs, except that they view the fiscal response as a propagation mechanism rather than as a causal impulse. For example, in 1995 Argentina and Mexico both experienced major financial-market crises, which constrained the abilities of both governments to finance fiscal deficits just as their economies entered recession. Gavin argued that in both cases fiscal changes were not the driving force, though the fiscal responses certainly propagated the initial shocks.

Marvin Goodfriend expressed concern that large countries such as the United States and Brazil might be responsible for much of the observed differences between the OECD and Latin American samples. Gavin replied that this was not the case, and he added that in future work they planned to look at international differences within regions. Colombia, for example, is an interesting outlier, being the only Latin American country consistently to run countercyclical fiscal policies and to have a

relatively stable economy. Moreover, some of the lower-income and more highly indebted OECD countries resemble Latin American countries along a number of dimensions. Olivier Blanchard pursued this point, asking whether OECD countries with roughly the same income per capita as some of the Latin American countries would be statistically distinguishable from the Latin American sample. Gavin admitted that they had not carried out that specific exercise but thought it would be difficult, given the small overlap across the two groups.

Angus Deaton suggested that macroeconomic volatility in Latin America could reflect in part those nations' dependence on commodities and their consequent vulnerability to terms-of-trade shocks. He pointed out that commodity prices are poorly understood and extremely difficult to forecast, so that even a policymaker with the best of motives would find it difficult to plan effectively in such an environment. Citing his own work on Africa, he noted that there seems to be little difference in fiscal performance between countries whose governments directly control the staple commodity and countries where the commodity is privately owned and marketed, as with crops.

Michael Klein asked if there was any role for differences in income inequality across the countries in explaining the findings about fiscal policy. For example, during good times, does a country with large inequalities want to help the lower end of the distribution more than those with very little inequality? Gavin agreed that this was an important issue which bore further investigation.

Michael Gavin then responded to a number of points made by the discussants. He agreed with Persson that the reverse Keynesian explanation has problems but suggested that it is still likely that fiscal procyclicality amplifies economic volatility in Latin America. In response to a suggestion that private-sector spending decisions could offset fiscal retrenchment in bad times, he noted that credit constraints appear to be binding for private agents as well as the government in bad times. Agreeing with Persson's comment regarding the importance of inflation, Gavin mentioned that they had found inflation surprises to have significant effects on both government spending and revenues. However, Latin America and the OECD were also different in this respect, as they found inflation surprises to have positive effects on the government budget surplus in the OECD and negative effects in Latin America.

