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THE FISCAL INSTITUTIONS OF TOMORROW

Ana Corbacho, Coordinator

Institutions for People

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THE FISCAL INSTITUTIONS OF TOMORROW

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Preface

The crisis of 2008–09 made clear that countries of the Latin American and Caribbean (LAC) region have, in general, learned from past harsh lessons about hyperinflation, fiscal adjustments, and mega-devaluations. The region surprised the rest of the world by its resilience and its vigorous recovery. Today, LAC countries are ready to tackle the challenge of consolidating these achievements in a sustainable way, looking to the future.

A central question of this challenge concerns strengthening institutions, those formal and informal constraints that, according to North (1991), define a country's incentive structure, and whose evolution determines, to a large extent, the course of the country's progression or its decline. The fact that institutions are important to development has been clearly demonstrated in existing literature. However, which institutional designs work best, how they can be implemented, and how their operation and implementation can be adapted for each country are key questions that have yet to be answered.

In particular, fiscal institutions are important for a wide range of objectives, from the moderation of macroeconomic fluctuations to efficiency and effectiveness in public expenditures to a country's vital economic growth. Which institutional design should be chosen if progress is to be made in each of these areas? What are the prior conditions necessary for each design? What have been the results of previous attempts at institutional change?

In order to tackle these questions, we offer this first edition of the IDB series *Institutions for People*. The series is a response to the IDB's mandate to build and strengthen institutions for the benefit of all citizens in the LAC region.

Throughout its five chapters, this volume presents alternatives for building fiscal institutions with the potential to benefit both current and future generations. The volume discusses fiscal rules that take the economic cycle into account, performance-based budgets, Integrated Financial Management Systems, policies to support small and medium-sized enterprises, and fiscal incentives for innovation.

This publication contributes to the institution-strengthening agenda in the region in two ways. First, it is a reference textbook, given that it draws together, in an accessible yet educational form, diverse concepts about the fiscal institutions of tomorrow. Second, it can become a beacon for both policymakers and economic analysts, given that its pages highlight successful institutional role models and areas for future research.

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Overview

The countries of the Latin American and Caribbean (LAC) region are on the verge of a paradigm shift. Just a few years ago, the region's name was blemished by its associations with "the debt crisis," "volatility," and "fiscal adjustment." Yet today, many of the region's countries have become examples of fiscal discipline in a way that was previously unimaginable. Without becoming complacent, the region has the opportunity to consolidate its gains and form part of the modern debate about better fiscal institutions; about fiscal institutions with future vision; about the fiscal institutions of tomorrow. How can fiscal policy contribute to macroeconomic stability? What is the best way to distribute the governments' scarce resources? How can public management be equipped in the most efficient way? Further still, how can fiscal institutions promote private sector productivity and development?

At the present time, the fiscal institutions of the LAC region are not only seeking solutions, but also providing them. Examples that inspire the rest of the world include fiscal rules adjusted by the business cycle, progress made toward performance-based budgets, and sophisticated financial management systems. Moreover, numerous LAC fiscal institutions have been successful in promoting productivity, a pending challenge in the region.

North (1991) wrote that institutions "evolve incrementally, connecting the past with the present and the future." This book seeks to illuminate the current state of this evolution in the field of fiscal institutions. The first part (chapters 1, 2, and 3) concentrates on the traditional roles of these institutions, such as macroeconomic stabilization, the allocation of budgetary resources, and public management. The second part (chapters 4 and 5) tackles the quest for productivity in private sector enterprises. In every case, the authors point to the progress made by diverse fiscal institutions in the region in recent years, describing their current state and recommending alternatives for their continued advance toward the fiscal institutions of tomorrow.

SAVING DURING THE GOOD TIMES TO AVOID SUFFERING IN BAD TIMES

When making reference to macroeconomic performance in the LAC region, the word "volatile" has been one of the adjectives most frequently used. Periods of robust growth have been succeeded by crises without parallel in numerous regions of the world. Fiscal policy has been at the epicenter of these crises. In many countries, instead of helping to smooth macroeconomic fluctuations, fiscal policy has often just

added fuel to the fire, amplifying volatility with disastrous results for the business climate and, above all, for the wellbeing of the people.

How can fiscal institutions promote economic stability and development over the long term? In Chapter 1, Gustavo García describes the possible advantages and drawbacks of fiscal rules. These are institutional arrangements that impose limits on certain fiscal aggregates, such as public borrowing, expenditures, and the budget balance. They were originally established to reduce authorities' discretion and reinforce the sustainability and credibility of fiscal policy. Thereafter, their role in contributing to macroeconomic stability became more important.

García provides a detailed description of four kinds of rules in light of these objectives: fiscal rules that establish obligatory balanced budgets or fiscal outcomes; rules that fix limits on the level of public expenditures; rules that instate revenue collection goals; and rules based on the structural fiscal balance or adjusted by the business cycle.

Although each kind of rule has its pros and its cons, those based on the structural fiscal balance are the only ones that simultaneously comply with the main fiscal policy objectives, especially with the one related to macroeconomic stability. In effect, these rules enable public expenditures to be stabilized within the level of structural fiscal revenues, demanding savings during the more prosperous times of the business cycle and allowing deterioration in the fiscal balance during adverse times.

But these types of rules also have their limitations, García warns. First, they are vulnerable to noncompliance or suspensions that might significantly damage their credibility. Second, the stabilizing capacity of fiscal policy might be seriously limited when the budgetary allocations that react automatically to the economic cycle (the so-called automatic stabilizers) are small, the transfers to subnational governments are large, or significant fiscal revenues are derived from natural resources with very volatile prices. Third, rules based on structural balance can sometimes be too rigid, for example, in the presence of natural disasters. Finally, viewed from the technical perspective, these are very complex rules, which means they are challenging to use and difficult to communicate transparently to the public at large.

Could any country establish a rule based on the structural fiscal balance? García identifies two classes of conditions that must first be satisfied: macroeconomic and institutional. The first group includes a sustainable public debt, good coordination with the monetary authorities, a solid financial and banking system, and adequate automatic stabilizers. The second group includes coherence between the rule and the budgetary system, alignment of the public sector administration and financial information systems, and compatibility with a federal tax system. Fiscal rules based on the structural fiscal balance can also be complemented with other institutional arrangements, for instance medium- and long-term fiscal frameworks and fiscal watchdogs, such as congressional budget bureaus.

In the LAC region, the Chilean structural balance rule stands out for markedly reducing public spending volatility and helping to stabilize the Gross Domestic Product (GDP) against a backdrop of sizable

external shocks. Most other countries in the region have a ways to go to improve fiscal and institutional aspects before implementing a structural balance rule, while some are not far off. Progress in meeting these conditions is a fundamental piece of the pending fiscal reform agenda in many countries, either to implement a structural fiscal balance rule or, more generally, to improve fiscal policy to make it an ally of stability, rather than its enemy.

SPENDING ON WHAT IS IMPORTANT

The impact that public policies can have on the wellbeing of the people is closely related to the public budget. The budget is the result of political and technical processes that do not just organize and regulate short-term public expenditures, but also support the whole spectrum of future government activities.

In Chapter 2, which deals with the performance-based budget (PBB), Mario Marcel, Juan Pablo Martínez, and Mario Sanginés highlight the importance of establishing clear objectives in the budget. These authors discuss the role of the budget as a fundamental institution and present clear objectives for the budget process: macroeconomic effectiveness, efficiency in allocation and use of resources, and transparency in budget management.

To achieve these objectives, the budgetary process develops in a permanently evolving cycle, which involves the planning, formulation, approval, execution, and evaluation of the budget, which in turns need to be taken into consideration for planning the next cycle. The budgetary models, such as "incrementalism," the program-based budget, and the zero-based budget, have become increasingly aligned with the objectives of the budgetary process.

Marcel, Martínez, and Sanginés emphasize that the PBB needs four pillars to ensure correct implementation and operation. The first pillar is information regarding performance, which is obtained through the monitoring and evaluation systems. The second pillar is the alignment of the budgetary process, at each one of its stages, so that it can incorporate said information. The third pillar entails institutionalizing incentive mechanisms so that the activities of civil servants are consistent with the expected results. The fourth pillar is the development of institutional management capacity.

Countries in the LAC region face common challenges on the road to implementing the PBB, in particular the persistent macroeconomic volatility (examined in Chapter 1), the gap between resources and the needs of the population (that exercise significant pressure on public spending), and certain dysfunctionalities in the budgetary structure (such as spending floors or an ineffective division of powers). In spite of these difficulties, some countries have made notable progress toward implementation of the PBB, which has resulted in better budgetary institutions and, ultimately, improved public services.

TOWARD INTEGRATED PUBLIC EXPENDITURE MANAGEMENT

To improve the registration and control of public expenditures when faced with past financial crises, many LAC countries have developed integrated financial management information systems (IFMIS). Presently, the IFMIS continue to be predominant systems in the region, and they are still evolving in response to a paradigm shift in fiscal management toward greater requirements in terms of efficiency and transparency and toward technological transformations that have made these requirements possible.

In Chapter 3, Pedro Farías and Carlos Pimenta concentrate on the importance of a good platform for public expenditure management. The authors begin by defining an IFMIS as an information system that automates the financial procedures needed for registering public sector expenditures and revenue.

A typical IFMIS has four components: a budgetary component to coordinate resource allocation and spending execution; a treasury component that covers all transactions related to proceeds and payments and cash management, in general (usually via a Unique Treasury Account that includes all public institutions); an accounting component to register and process transactions, monitor revenues and expenditures via the general ledger, and produce basic financial statements; and a public debt component that includes the administrative procedures to capture indebtness.

To guarantee a more homogenous flow of information and provide better support for decision making, an IFMIS can also be integrated into other systems, such as public procurement, payroll, the administration of property or public investments, and revenue administration. The way in which these multiple functions are related and complement each other will determine the scope of the IFMIS.

As with fiscal rules, IFMIS must meet certain conditions before they can function adequately. The conditions include, among others, a high and sustained level of political support, a well-defined conceptual design, efficient project management, an adequate implementation sequence, and appropriate technology planning.

In effect, Farías and Pimenta set out in detail the series of technological decisions that an IFMIS demands. For example, it has evolved from a monolithic programming architecture to client-server, then to a multi-level system, and more recently to a Service-Oriented Architecture (SOA). The architecture can also comprise centralized or distributed databases. On the other hand, decisions must be made between in-house technology development and outsourcing; between putting into place an integrated management solution, such as Government Resource Planning (GRP), and using other solutions; and between using patented and open-source software.

What do IFMIS in the LAC region look like? Regarding their interoperability with other systems, the general level of integration is low, with the exception of Bolivia and Brazil. Regarding technology, the majority of countries have developed a multi-level technology with increasing use of open-source software.

As far as quality is concerned—and this holds true for public administration in general—IFIMS in the region display a wide degree of heterogeneity.

The remaining challenge is to continue to advance toward systems that are committed to supporting effective management and decision making. As Farías and Pimenta warn, IFMIS should not be seen merely as information technology tools, but rather as instruments that can fulfill a wider strategic role in modernizing public management in the region and in supporting other fiscal institutions, such as the structural fiscal rules or PBBs, described in chapters 1 and 2.

IN SEARCH OF THE LATIN SMES

In the last two decades, the LAC region has made significant social and economic progress. However, from a long-term perspective, economic growth has been less dynamic than in other emerging market regions. Low levels of productivity underlie this phenomenon. For the region to really "take off," its potential for productivity must be unleashed. What is the role of the public institutions to make this ambition a reality?

In Chapter 4, Martin Chrisney and Joan Oriol Prats tackle the subject of small and medium-sized enterprises (SMEs). As the authors illustrate, low levels of productivity in the LAC region are linked to a bias toward informal microenterprises and the absence of formal SMEs. This limits the availability of quality jobs, the competitive function of the markets, and the fiscal entrepreneurial space.

Two kinds of factors can limit the development of SMEs: institutional factors and structural factors. The former impact business transaction costs, as well as the relative price of capital versus labor. The latter are related to a country's sectoral, demographic, and human capital structures.

Fiscal policies, along with the business climate and access to credit, can hamper SME development. In effect, tax systems and revenue administration shape the incentives that enterprises have to declare sales and profits, and can encourage them to keep production levels low, limiting the advantages of economies of scale and growth in productivity.

Based on a sample of 210 countries, Chrisney and Oriol Prats present a spectrum of factors that limit the development of SMEs. With respect to fiscal policies in particular, the tax rate estimated for a typical SME in the LAC region is comparable to the global average, even though it is situated 11.9 percentage points above the Asian average and surpasses North America by 5.5 percentage points. The authors also describe the results of impact evaluations of diverse reforms aimed at SME development. In the case of fiscal policy, a common reform has been the creation of simplified tax regimes for small enterprises. These regimes have generally increased the number of formal enterprises, but they have

also encouraged the phenomenon of "fiscal dwarfism"—that is, the use of diverse strategies on the part of businesses to remain in a low production scale and qualify for the simplified tax regime.

The authors conclude that there is a clearly identified relationship between SMEs and productivity. Yet, a vast analysis is still needed to determine which policies are more effective in promoting productivity growth via SME development.

INNOVATING FOR GROWTH

Innovation is the main driver of productivity growth. Unfortunately, private sector firms in the LAC region have low levels of investment in innovation. In Chapter 5, Gustavo Crespi examines the challenge of achieving high productivity through the use of fiscal incentives to stimulate enterprise innovation.

But why promote innovation through public policy? Crespi elaborates on three main factors that constitute the raison d'être of pro-innovation policies. First, innovation has the characteristics of a public good. Second, there are problems of asymmetric information in the financing and development of innovative ideas. Finally, there are both coordination and institutional failures in the innovation process.

When faced with scant investment in innovation by the private sector, two institutional approaches can be considered: direct knowledge production by public institutions and fiscal incentives for greater production by the private sector. Crespi describes the advantages and disadvantages of fiscal incentives, in particular direct grants and tax breaks.

The numerous impact evaluations highlighted in Chapter 5 indicate that both types of fiscal incentives are effective in augmenting investment in innovation by private enterprises, although, based on the fiscal incentive employed or the type of beneficiary, different results emerge. Crespi warns of the challenges of managing tax incentive programs in a transparent and effective manner. Furthermore, the impact of pro-innovation policies on variables most directly associated with growth in productivity is not so clear, in part because a longer time frame is necessary to properly evaluate these impacts.

Finally, Crespi discusses various topics that can help advance knowledge and public policies on innovation: the impact of subnational pro-innovation policies within a federalized country; the relation between the policies of innovation and entrepreneurial incentives; and the factors that determine innovation in the services sector. Given the positive results of existing pro-innovation policies, knowledge about new areas of impact could have an enormous potential for future innovation policies in both the LAC region and the world at large.

THE FISCAL INSTITUTIONS OF TOMORROW

The themes discussed in these chapters cover a wide spectrum of fiscal institutions and their contributions to numerous objectives, ranging from macroeconomic stabilization and public resource allocation and management, to economic growth through higher productivity and private sector innovation. A combination of the fiscal institutions highlighted in the first three chapters would enable a panacea of fiscal policies that would be (i) stable and sustainable, (ii) focused on providing better public services for people, and (iii) supported by modern information technology platforms that facilitate efficient and transparent public management. But the role of the fiscal institutions of tomorrow does not stop there. The challenge of productivity in LAC requires new institutional arrangements to promote the formalization of SMEs and investment in innovation, and thereby unleash the region's potential for development. Against this background, although there is still a long way to go, the LAC region has become a pioneer in the debate on better fiscal institutions, institutions with a vision of the future, the fiscal institutions of tomorrow.

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CHAPTER 1

Fiscal Institutions to Strengthen Countercyclical Policies and Fiscal Sustainability

Gustavo García

- Macroeconomic and financial stability are indispensable requisites for robust and sustained growth.
- Stable and sustainable fiscal policies are fundamental anchors of macroeconomic stability.
- Fiscal rules based on the structural balance can secure a stable and sustainable fiscal policy. However, for these rules to be effective and credible, certain prior economic and institutional conditions must be met.

INTRODUCTION

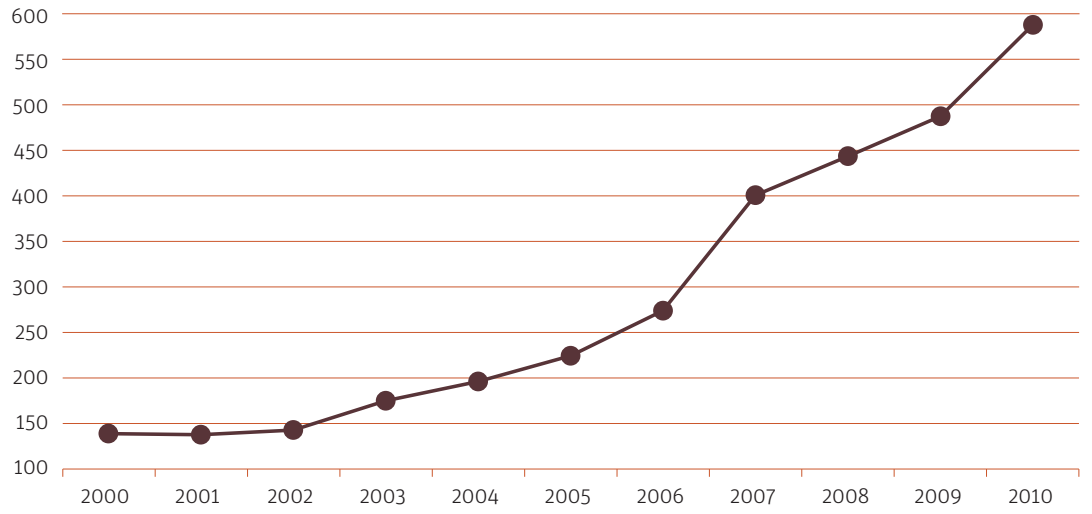
Volatility and Fiscal Policy: Past and Recent Experiences in Latin America and the Caribbean

Before the surge in prices of raw materials seen throughout the new millennium, the Latin American and Caribbean (LAC) region was characterized by decades of high macroeconomic volatility, which was exacerbated by procyclical fiscal policies. During the expansive phases of the economic cycle, expenditures were increased or certain taxes were reduced, whereas in recessive periods, the practice was reversed. These policies accentuated macroeconomic volatility to such a degree that the region was labeled as one of the most unstable regions worldwide in terms of economic growth. This behavior was particularly problematic in countries exporting raw materials, where the volatility of the business cycle was, by its very nature, already accentuated by international variations in prices for these products, but it was also significant in the other countries in the region.[1]

The structural reforms and efforts to strengthen fiscal sustainability and macroeconomic stability, which the majority of the countries undertook from the beginning of the 1990s, resulted in better preparedness to tackle the effects of the 2008–09 global financial crisis. Evidently, the extraordinary increase in the price of raw materials that occurred from 2003 onward substantially contributed to this favorable evolution. However, in contrast to earlier decades, a large part of the additional revenue was saved. A sustained increase in international reserves, better fiscal outcomes, and five years of significant growth have

[1] See IDB (1995), Alesina et al. (1996), Gavin et al. (1996), and Gavin and Perotti (1996).

FIGURE 1.1: NET INTERNATIONAL RESERVES IN LAC-7, 2000–10
(IN BILLIONS OF USD)



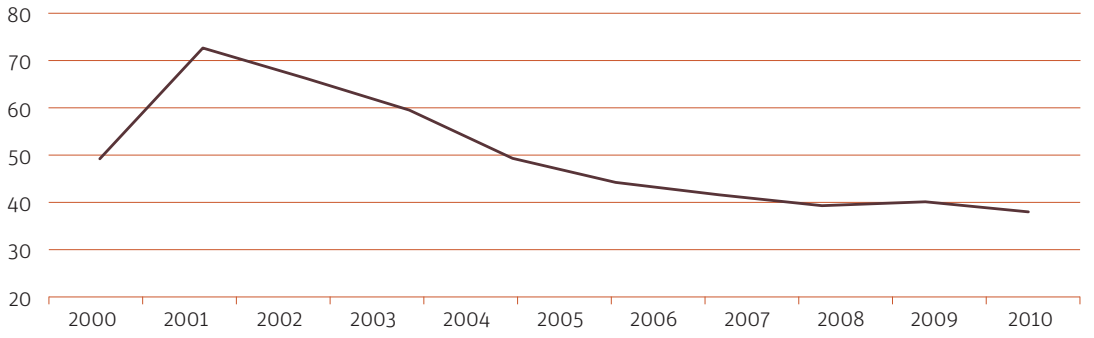
Source: IMF (2011).
Note: LAC-7 is composed of Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela.

led to a reduction in the burden of debt and, in particular, a reduction in external debt. These two characteristics have made the region much less vulnerable to external shocks (see figures 1.1 and 1.2).

One of the region's most noteworthy features during the financial crisis was that, with some important exceptions, the procyclical fiscal policy bias diminished considerably compared to previous decades. Several countries enjoyed sufficient fiscal space to implement countercyclical policies that tend to protect employment and economic activity. Other countries at least avoided being forced to adopt completely procyclical policies. Furthermore, with very few exceptions, countries have not had to seek financing through unorthodox mechanisms or ones that cause distortions, which might lead both internal and external financial markets to lose confidence. Moreover, in further contrast with the past, the countercyclical efforts of monetary authorities were accompanied by lowering interest rates, while depreciation of the exchange rate partially offset the fall in the terms of trade, without unleashing inflationary pressures or creating concern in the financial markets.

Brazil, Chile, Colombia, Panama, Peru, and Uruguay are among the countries enjoying greater fiscal space, which they can use to maneuver with regard to countercyclical, or not entirely procyclical, policies without affecting fiscal sustainability over the medium and short term. Mexico, which was hard hit by the crisis because of its proximity to and integration with the U.S. economy, adopted various policies

FIGURE 1.2: EXTERNAL DEBT OF NATIONAL GOVERNMENTS IN LAC-9, 2001–10
(PERCENTAGE OF AGGREGATE GDP)



Source: IMF (2011).
Note: LAC-9 is composed of Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Uruguay, and Venezuela.

to defend primary expenditures and protect the lowest-income sectors. However, Mexico was forced to turn back from some of these efforts and to introduce some moderate tax hikes. The majority of Caribbean and Central American countries lacked the capacity to implement countercyclical policies, and Venezuela was forced to pursue procyclical policies. In Argentina's case, countercyclical policies were financed using mechanisms that some authors have described as having a distorting effect.[2]

Despite all this, the intensity of the global financial crisis was of such magnitude that economic growth was interrupted in 2009. In effect, after the period of economic expansion observed between 2003 and 2008 (5.3 percent on average), the region's economic activity contracted 2.1 percent and unemployment rose by almost a full percentage point (to an average of 8 percent) in 2009. However, it is worth remembering that various countries, among them Brazil, Chile, Colombia, Costa Rica, Mexico, Panama, Peru, and Trinidad and Tobago (Table 1.1), had been experiencing strong growth for many years as a result of rising raw material prices. In other words, although some countries implemented policies that were countercyclical or, at least, not entirely procyclical in nature, these policies were not strong or effective enough to avoid contraction, given the severity of the crisis. This might be because the policies themselves were not effective or because the fiscal margin was too limited. Even Chile, despite having fully working automatic stabilization mechanisms from its fiscal rule and the relaxation of this rule, could not avoid a sharp drop in gross domestic product (GDP) (down by 1.7 percent) after several years of continuous growth.

[2] For a more detailed explanation of the policies adopted by Argentina to tackle the crisis, see Rivas (2010a).

TABLE 1.1: RATES OF VARIATION IN REAL GDP IN THE LAC REGION, 2004–10
(PERCENTAGES)

COUNTRY	2004	2005	2006	2007	2008	2009	2010	2011
Argentina	8.9	9.2	8.5	8.7	6.8	0.9	9.2	8.9
Bolivia	2.7	6.8	2.8	5.3	6.1	3.4	4.1	5.1
Brazil	5.7	3.2	4.0	6.1	5.2	–0.3	7.5	2.7
Chile	6.8	6.3	5.8	5.2	3.0	–0.9	6.1	5.9
Colombia	5.3	4.7	6.7	6.9	3.5	1.7	4.0	5.9
Costa Rica	4.3	5.9	8.8	7.9	2.7	–1.0	4.7	4.2
Dominican Republic	1.3	9.3	10.7	8.5	5.3	3.5	7.8	4.5
Ecuador	8.8	5.7	4.8	2.0	7.2	0.4	3.6	7.8
El Salvador	1.9	3.6	3.9	3.8	1.3	–3.1	1.4	1.4
Guatemala	3.2	3.3	5.4	6.3	3.3	0.5	2.8	3.8
Haiti	–3.5	1.8	2.2	3.3	0.8	2.9	–5.4	5.6
Honduras	6.2	6.1	6.6	6.2	4.1	–2.1	2.8	3.6
Mexico	4.0	3.2	5.1	3.2	1.2	–6.3	5.5	4.0
Nicaragua	5.3	4.3	4.2	3.6	2.8	–1.5	4.5	4.7
Panama	7.5	7.2	8.5	12.1	10.1	3.9	7.6	10.6
Paraguay	4.1	2.9	4.3	6.8	5.8	–3.8	15.0	3.8
Peru	5.0	6.8	7.7	8.9	9.8	0.9	8.8	6.9
Trinidad and Tobago	7.9	6.2	13.2	4.8	2.7	–3.3	0.0	–1.3
Uruguay	4.6	6.8	4.1	6.5	7.2	2.4	8.9	5.7
Venezuela, Rep. Bol.	18.3	10.3	9.9	8.8	5.3	–3.2	–1.5	4.2
Simple average of group	5.4	5.7	6.4	6.3	4.7	–0.3	4.9	4.9
Weighted average of group	6.2	4.9	5.8	5.8	4.1	–2.0	6.3	4.6

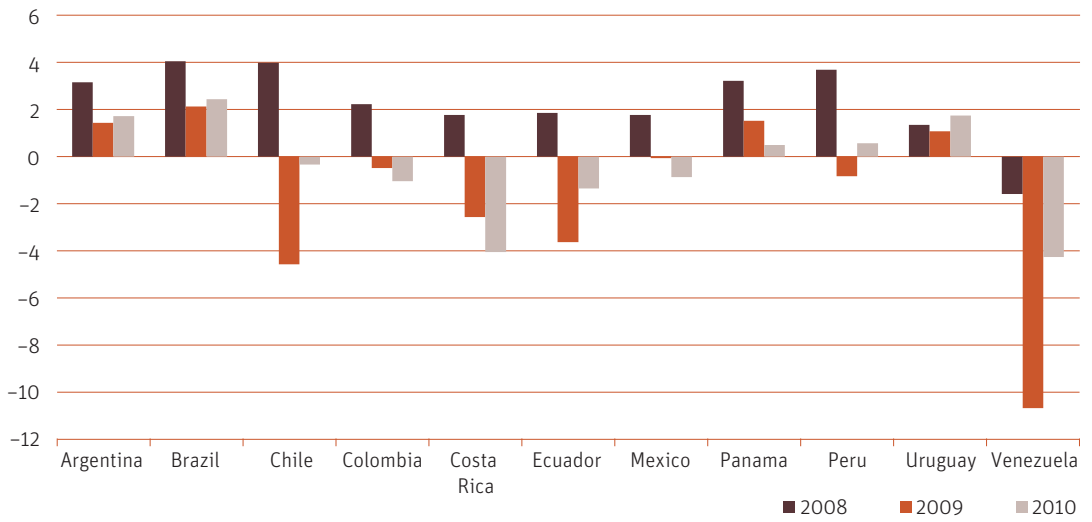
Source: IMF (2011).
Note: The weights applied are based on GDP in USD for 2000.

These events contributed to a rebirth of fiscal policy as a stabilizing instrument. This became even more critical because of the limited effectiveness of monetary policy, given that simply reducing interest rates was not enough to stimulate aggregate demand. It is fair to say that in the latest cycle of world economic growth, within the context of first increasing and then decreasing terms of trade, the majority

of LAC countries acted, from a fiscal policy perspective, in a countercyclical, or at least less procyclical fashion than in the past, reducing deficits or augmenting fiscal surpluses during the boom, and reducing surpluses and increasing those deficits during the recession (see Figure 1.3).

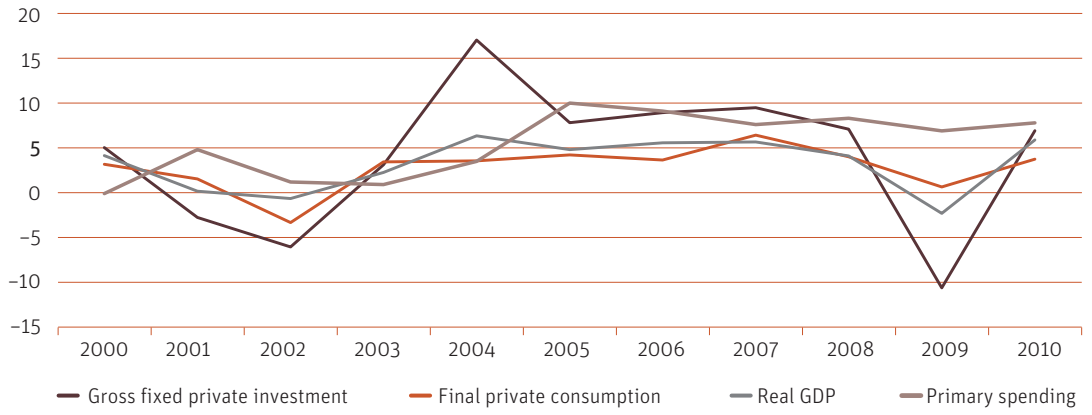
With very few exceptions, procyclical fiscal policy is currently not a common characteristic in the majority of countries in the region. In fact, during the second half of the last decade, variations in real GDP were much more likely to be associated with real variations in consumption and private investment than with variations in real primary expenditures by national governments (see Figure 1.4). Even so, there is much that can be improved regarding the countercyclical effort in the overall region. The fact that the procyclical nature of fiscal policy has diminished to a large extent in LAC countries does not necessarily mean that countercyclical policies have been markedly symmetric. On the contrary, it is highly likely that the countercyclical nature of fiscal policies was more pronounced during the recession than during the recent period of rising raw materials prices, which is the reason why a certain level of procyclicality has been maintained in various countries. The fact that there is no reference value either for GDP or for the principal fiscal aggregates adjusted by the business cycle means that this asymmetric policy bias has not fully diminished.

FIGURE 1.3: PRIMARY FISCAL BALANCE IN SELECTED LAC COUNTRIES, 2008–10
(PERCENTAGE OF GDP)



Source: IMF (2011) and IDB LWM Database (2012).

FIGURE 1.4: VARIATIONS IN GDP, CONSUMPTION, EXPENDITURES, AND INVESTMENT IN LAC-9, 2000–10
(PERCENTAGE)



Source: IMF (2011).
Note: LAC-9 is composed of Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Uruguay, and Venezuela.

How Can Fiscal Institutions Help Reduce Macroeconomic Volatility?

Well-designed fiscal rules can improve fiscal institutions, and thereby reinforce the stabilizing role of budgetary policies and enhance the authorities' capacity to withstand exogenous shocks. However, some of these rules might have a marked procyclical bias that, instead of strengthening fiscal policy's stabilizing role, might instead contribute to propagating the effects of the shocks. This is one of the clearest lessons that can be drawn from the recent international crisis. Both in Europe and in the LAC region, many countries were forced to temporarily suspend their fiscal rules or, rather, to reform them, particularly those based on balanced budgets or borrowing ceilings, given that compliance with them would have deepened the impact of the crisis. Such unforeseen changes, or temporary suspensions of the rules, can damage the credibility of both the rules themselves and of the sustainability of fiscal policy in general.

Fiscal rules based on structural balanced budgets or adjusted by the business cycle can contribute to simultaneously reducing or eliminating the procyclical bias of fiscal policy, consolidating fiscal sustainability, and enhancing the credibility of macroeconomic policies in general. However, whether a rule of this nature can be effective, credible, and sustainable over time, given its technical complexity, depends on two fundamental factors. The first refers to elements of political economy, given that the rule has to be established against a background of political stability and supported by a broad political and social consensus. Although these elements are not the central theme of this chapter, they will be further

examined below, based on recent experiences in the region that prove most enlightening. The second factor refers to the need to satisfy certain institutional, economic, and technical preconditions that guarantee compliance with the rule's objectives, and its effective operation. If these conditions are not met, there is a high risk that the rule will fail, with a subsequent loss of credibility in both fiscal institutions and the economic authorities. There are also important lessons in this regard that are analyzed below.

These preconditions were the focus of a study conducted by the Inter-American Development Bank (IDB) between 2010 and 2011 titled "Preconditions for Establishing a Fiscal Rule Including a Structural Balance Component in Latin America and the Caribbean" (García, 2011). The study adds value to the topic in that it deals with these institutional, economic, and technical preconditions, both from a conceptual perspective and within the region's specific context, based on analysis of a wide range of countries.

Based on the reflections of this study, the first section of this chapter defines the concept of fiscal rules; then describes the most commonly utilized fiscal rules, with particular emphasis on the LAC region; and concludes with an examination of the advantages and disadvantages of each rule. The second section examines the political economy of fiscal rules, particularly of those rules based on the structural balance. The third section presents a brief analysis of the fiscal rule in Chile, the only country in the region that had, at the time of writing this chapter, a fiscal rule adjusted by the business cycle, and which now has an accumulated experience of 11 years since it entered into effect.[3] The fourth section provides a short summary of the other countries included in the study, with special emphasis on the preparedness of each country to adopt a fiscal rule adjusted by the business cycle. Thereafter, the chapter presents the conclusions of this analysis.

WHAT ARE FISCAL RULES?

Definition

Fiscal rules are explicit intentions of authorities to maintain the discipline, sustainability, and transparency of fiscal policy in the short and the long term, and are established within the legal framework that governs budgetary policy. The rules can be procedural or quantitative. Procedural fiscal rules are part of a wider regulatory and institutional body of fiscal and budgetary policies that are usually set out in organic budget laws, such as pluriannual budgets; transparency regulations and accountability; procedures for the formulation, debate, and approval of annual budgets; and so on.[4] Quantitative fiscal rules

[3] Halfway through 2011, the Colombian Congress approved a business cycle-adjusted rule.

[4] Many countries have gone on to consolidate all of these policies into a single legal body to ensure the consistency of the regulatory fiscal framework.

establish a restriction or a numerical limit on a determined fiscal aggregate or budget that must be observed as a legal budgetary condition. This quantitative restriction is usually a cap on the level of borrowing or public expenditures, a limit on fiscal deficit, a specific fiscal surplus or fiscal balance target, or simply the obligation to maintain a balanced budget. In other words, a quantitative fiscal rule expresses the authorities' explicit commitment to a quantifiable and observable specific restriction or target regarding a determined fiscal aggregate, which is legally binding.

Types of Fiscal Rules: Advantages and Disadvantages

Approximately 80 countries use fiscal rules based on quantitative targets to implement their fiscal policies (Table 1.2). The adoption of fiscal rules is associated with economic, political, and social factors that pertain to the evolution of fiscal policy in each country. For example, in countries that seek to limit the size of the public sector, the tendency has been to impose a public expenditure ceiling. Countries with a history of crises due to public debt default or unsustainable fiscal policy have tended to establish a limit on public borrowing or an obligation to maintain a balanced budget.

Initially, fiscal rules tended to be established to reduce the authorities' discretion and the intertemporal inconsistencies of certain budgetary decisions. Examples of this are increased expenditures and borrowing during electoral periods, or increased spending in response to social or trade union pressure that arises under certain circumstances (e.g., whenever there is a sudden surge in public revenues in raw material-exporting countries).

Recently, some European countries have adopted fiscal rules adjusted by the business cycle. The intention behind this kind of rule is to separate fiscal outcomes from the business cycle and establish fiscal policy targets according to the structural factors that determine the evolution of GDP over the long term. In this way, during the expansive phase of the cycle, the increase in public revenues is not translated into increased expenditures and, similarly, in the recessive phase, the diminished revenues do not force the government to cut back on spending. In other words, budgetary expenditure targets are not set with an eye to GDP observed over the short term, or for a specific year, but are instead defined according to the expected GDP value over the long run. This eliminates the risk of a procyclical fiscal policy.

In summary, the fundamental initial purpose of establishing fiscal rules has been to preserve fiscal sustainability over the long term and strengthen the credibility of macroeconomic policy. Over time, the need to reduce macroeconomic volatility has meant that fiscal policy has taken on a stabilizing role. The advantages and disadvantages of each kind of fiscal rule become evident when evaluated with these three goals in mind: sustainability, credibility, and stability.

TABLE 1.2: FISCAL RULES—SELECTED EXAMPLES, 2008

COUNTRY	TYPE OF RULE AND STARTING DATE[a]	LEGAL BASIS[b]	RANGE[c]	PERIODICITY[d]
Advanced countries[e]				
Australia	RI, BBR; DBR (1998)	L	CG	M
Canada	RG; BBR; DBR (1998)	GC	CG	A
France	RG (1998); RI(2006); BBR; DBR (1992)	GC; L; IT	CG; NG	A; M for EBR
Germany	BBR (CA); DBR (1992); EBR (1982)	IT; C	NG; CG	A; M for EBR
Hungary	BBR (CA) (2007); DBR (2004)	IT; L	NG	A
Italy	BBR; DBR (1992)	IT	NG	A
Japan	RG (1947): Golden Rule	L	CG	M
Netherlands	RG; RBR (1994); BBR; DBR (1992)	L; IT	NG	A; M for EBR
New Zealand	BBR; DBR (1994)	L	NG	M
Norway	BBR (2001)			
Spain	BBR (2003); DBR (1992)	L; IT	NG	A; M
Sweden	RG (1995); BBR; DBR (1995)	GC; IT	NG; CG	AC; M for EBR
Switzerland	BBR (CA)	C	CG	AC
United Kingdom	BBR (CA); DBR (1997)	GC; IT	NG	AC or M
Emerging Countries				
Argentina	RG; BBR; DBR (2000)	L	CG	A
Brazil	RG; BBR; DBR (2000)	L	NFPS	A
Chile	BBR (CA) (2000, 2006)	L	CG	A
India	BBR (2004)	L	CG	A
Indonesia	BBR (1967); DBR (2004)	GC	NG	A
Mexico	BBR; RBR (2006)	L	NFPS	M
Peru	RG; BBR (2000)	L	NFPS	A

Source: Ter-Minassian (2010), based on IMF (2009d).

[a] Type of rule: BBR = balanced-budget rule; BBR (CA) = cyclically adjusted or balanced-budget rule according to cycle; DBR = debt-based rule; EBR = expenditure-based rule; RBR = revenue-based rule.

[b] Legal basis: GC = government commitment; L = law; C = constitution; IT = international treaty.

[c] Range: CG = central government; NG = national government; NFPS = nonfinancial public sector.

[d] Periodicity: A = annual; M = multiannual; AC = according to cycle.

[e] For European Union (EU) members, the preventative arm of the Stability and Growth Pact establishes medium-term objectives formulated in structural terms (i.e., adjusted according to the cycle and corrected for exceptional factors), but the corrective branch still centers on the 3 percent non-adjusted deficit over GDP, as a trigger for the Excessive Deficit Procedure.

Fiscal rules that establish balanced budgets or fiscal balance targets

This kind of rule establishes an obligation to execute balanced budgets, implement specific fiscal surplus targets, or limit the deficit. These limits or targets can be fixed on the overall fiscal balance, the primary balance, or the current balance.[5]

Such rules have the advantage of reducing the authorities' budgetary discretion and can also contribute to consolidating the sustainability of fiscal policy. At the same time, establishing such rules sends a clear message about the long-term fiscal policy goal. However, it has a serious disadvantage if the fiscal targets are not adjusted by the business cycle, because this can generate a procyclical bias that might exacerbate macroeconomic volatility. For example, a fall in revenues during the recessive phase of the cycle might force authorities to trim expenditures and/or raise taxes to preserve budget equilibrium, comply with a deficit limit, or reach a surplus target. Cutting expenditures and/or raising taxes in a recession will accentuate the economic contraction.

If the budget equilibrium target is established on the current balance (the Golden Rule), authorities might be tempted to misclassify a series of expenditures as public investment. Similarly, this kind of rule can give rise to a bias toward physical investments as opposed to investments in human capital. Finally, such rules can create incentives to use budgetary resources in investment projects that are not necessarily efficient or profitable, or even focused on areas where public spending is most needed.

Fiscal rules that impose a cap on public expenditure levels

This kind of rule mainly arises from the desire to limit the size of the public sector and, indirectly, to impose limits on taxation rates. The limits can be applied to certain expenditure categories, such as primary expenditures (which excludes the payment of interest on public debt), current expenditures, or total public spending. This kind of rule established with regard to overall or primary spending has the advantage of sending a clear signal of fiscal policy intentions over the medium and long term, reducing the authorities' discretion, and limiting intertemporal inconsistencies, particularly during electoral periods. Furthermore, if the expenditure cap is defined relative to the size of potential GDP, then the rule does not necessarily have to induce a procyclical bias. Further, it is thus a better option than borrowing caps or balanced-budget rules, given that the cap allows automatic stabilizers to operate and, therefore, permits fiscal policy to play its stabilizing role.

This kind of rule does, however, have various disadvantages. First, if the expenditure target is defined relative to the business cycle or current GDP, then a procyclical bias is generated. Second, even if the spending cap is not defined in this way, as long as it is not specifically related to the value of potential

[5] The current balance is the fiscal balance without including public investment. It is also known as the "Golden Rule." See Kopits and Symansky (1998) and IMF (2009d).

or structural GDP, then the role of fiscal policy as a stabilizing mechanism is reduced. Third, the debt sustainability target is not guaranteed since, if there is a temporary or permanent decrease in public revenues, spending could be financed up to the limit through borrowing, which would also affect the fiscal policy's credibility. Fourth, room to maneuver when faced with exogenous shocks, such as natural disasters or sudden increases in the interest rates that push up debt servicing costs, might be limited. A limitation in maneuvering room could require an adjustment to the composition of total expenditures to the detriment of primary expenditures, which could have recessive effects. Finally, if the limit is established on current expenditures, the same distortions mentioned above regarding rules applied to the current balance, or the Golden Rule, might materialize.

Fiscal rules that establish limits on borrowing levels

This kind of rule is designed to send a strong signal of the authorities' intention to maintain strict control over public borrowing to ensure fiscal policy discipline and sustainability. Therefore, under normal circumstances, such rules help reinforce the credibility of fiscal policy because they enforce the execution of balanced budgets.

The drawback of this kind of rule is that, when revenues fall, as occurs with rules based on balanced budgets, governments are automatically obliged to reduce expenditures, which reinforces the effects of a recession or of any other negative shock and, consequently, tends to generate a procyclical effect on fiscal policy. Furthermore, by imposing expenditure adjustments in certain circumstances, it is quite common that the less rigid, or socially or politically sensitive expenditures, such as capital investment, are the first to be cut back. This can lead to a subsequent deterioration in fiscal policy quality and in medium- and long-term growth potential. Finally, this kind of rule can, under certain conditions, give incentives not to properly register some liabilities, or register them outside of the budget, to evade the borrowing ceiling, eroding fiscal transparency.

Fiscal rules that establish revenue targets (ceilings or floors)

This kind of rule is generally introduced with the intention of limiting the burden of taxes within a society. Such a rule might also be designed to improve collection of tax revenues by limiting the rates of existing taxes or by setting new ones. These rules also have the advantage of generating greater levels of tax certainty over the medium term, as they set a limit on taxation for private investors and for businesses in general. However, it is worth mentioning the disadvantage that financial sustainability is not thereby guaranteed and, given that there are no limits on expenditures, public borrowing can spiral out of control. Consequently, these rules also cannot enhance the credibility of macroeconomic policy.

Finally, revenue-based rules do not reduce procyclical policy bias, given that the set revenue level is not linked to structural GDP. Increased revenues during the cycle's expansive phase might induce

inefficiency within the tax collection administration, which would be difficult to turn around during a recessive phase. Therefore, the revenues needed to avoid fiscal deficits or an increase in public borrowing would not be guaranteed. Furthermore, if there are restrictions on liquidity or on access to financial markets, or if the authorities wish to avoid greater borrowing, authorities will be forced to reduce expenditures and thereby exacerbate the cycle's recessive phase. These circumstances can also be to the detriment of the credibility of fiscal policy.

Fiscal rules based on structural balance or adjusted by the business cycle

Fiscal rules based on structural budgetary balance establish a fiscal balance target adjusted by the economic cycle. In other words, the fiscal policy target is not subject to short-term fluctuations in the economic cycle. Consequently, the target simultaneously seeks to preserve the sustainability of public debt over the long term, reinforce the stabilizing role of fiscal policy, reduce authorities' discretion, and, therefore, reinforce confidence in macroeconomic policy. As a result, this type of rule has the advantage of being the only one that simultaneously fulfills all the aims of an optimum fiscal rule: sustainability, credibility, and stability.[6]

Fiscal policy's role as a stabilizing mechanism is fulfilled through automatic stabilizers, which are budget items that automatically increase expenditures and decrease taxes in the recessive phase of a cycle, or conversely, increase taxes and decrease expenditures during the expansive phase.[7] These provisions operate without the need for discretional intervention from authorities, which explains their description as automatic stabilizers. Automatic stabilizers arise from the changes or adjustments to certain expenditures or taxes that occur mechanically in reaction to the business cycle. For example, during a cycle's recessive phase, tax collection drops (in particular, corporate and personal income tax), whereas spending rises because of increased transfers to cover unemployment benefits. In this way, revenue increases for businesses and families, which has a countercyclical or stabilizing effect on demand. The reverse occurs during an expansive phase. Taxes increase given that families and businesses are enjoying higher earnings, and expenditures decline because a smaller proportion of transfers need to be dedicated to unemployment benefits. Consequently, earnings—and, therefore, business and household demand—are reduced, which produces, symmetrically and automatically, a stabilizing fiscal policy effect.

[6] This does not mean that a structural balance-based fiscal rule, one adjusted by the business cycle, or even fiscal rules in general are an essential condition for the existence of optimum fiscal policy. This depends on the peculiar factors found in each country, in particular the trend of fiscal policy over the long term and the strength of its institutions. This point is further examined in the conclusions.

[7] For more detailed analysis of this concept, see Baunsgaard and Symansky (2009).

The major advantage of automatic stabilizers is that they do not require the authorities to use discretionary measures. Such measures would likely cause a delay in implementation and be excessive in terms of the magnitude required to stabilize the business cycle. This would deem them ineffective if they are below the necessary stabilizing stimulus or could lead to inflationary pressures due to high demand if the stimulus is too great. Furthermore, the majority of discretionary measures can be difficult to turn around once the direction of the business cycle has changed, particularly when adopted during recessive periods. An increase in expenditures or a tax cut that becomes permanent, or cannot be reversed in the short term, can be a detriment to the credibility and sustainability of fiscal policy.

How well automatic stabilizers operate and, therefore, the stabilizing capacity of fiscal policy, depends fundamentally on two factors. On the one hand, insofar as the size of government (measured as a proportion of expenditures or revenues to GDP) is greater or smaller, the automatic stabilizers will be greater or smaller, respectively. On the other hand, the greater the sensitivity of revenues and expenditures to the variations of the business cycle, the greater the size of the stabilizers will be.

The above statement can be demonstrated with some simple examples. For example, the greater the weight of income tax in the tax collection structure, the greater the elasticity of public revenues will be to variations in GDP, given that this tax is highly responsive to changes in the business cycle. Likewise, the more progressive the tax, the greater its reaction will be to changes in income levels throughout the business cycle. Similarly, the greater the importance of unemployment benefits and their range of coverage within the labor market, the greater the sensitivity of public expenditures will be to variations in the cycle and, therefore, the size of the automatic stabilizers. In contrast, if the amount of the transfers made for unemployment benefits is very low, or if coverage in the labor market is limited, the stabilizers will be reduced in size. For example, in countries where the labor markets have a high degree of informality and are not covered by unemployment benefits, the variability in public spending according to the business cycle is lower and the size of the stabilizers is, therefore, reduced. This limits the automatic stabilizing capacity of fiscal policy.

The Limitations of Fiscal Rules

As previously mentioned, recent experience in the LAC region during the financial crisis of 2008–09 highlighted the need to improve the stabilizing capacity of fiscal policy, without losing sight of the aim of preserving the sustainability of public finances or affecting confidence in macroeconomic policy. Nearly all of the countries in the region that established rules with numerical limits on certain fiscal aggregates without making adjustments for the business cycle—such as ceilings on public borrowing, public spending caps, balanced budgets, or certain fiscal outcome targets—were forced to modify or abandon their rules because of a marked procyclical bias. In order to comply with rules, authorities would have been forced to increase taxes and/or reduce spending in the midst of a crisis, which would have accentuated

the recessive effects. For this reason, nearly all countries had to suspend, disregard, or reform their rules. With the exception of Chile, no country in the region had established rules based on structural fiscal balance until mid-2011, when Colombia approved a rule of this kind. Chile, however, was also obliged to temporarily modify its fiscal outcome target, although not the rule itself, given the magnitude of the shock caused by the global financial crisis.

Suspensions of, or noncompliance with, the rules each time that the business cycle changes direction can reduce their effectiveness in achieving the goals of fiscal sustainability and macroeconomic policy credibility. This has happened various times in the region, especially in those countries with a high dependence on the export of raw materials. Given the high volatility of these resources, if the fiscal rules are not well designed at the outset, countries dependent on natural resources may need to suspend or disregard them.

Along with possible suspension, another limitation of fiscal rules, even with regard to rules based on structural fiscal balance, is that the stabilizing capacity of fiscal policy can be compromised if the automatic stabilizers are small. In general, and for various reasons, this is the case in the LAC region. First, the importance of income tax in the fiscal revenue structure is relatively low, particularly concerning personal income tax. Second, income tax is not very progressive. Third, labor markets are highly informal, which reduces unemployment benefit coverage. Furthermore, labor informality takes financial capacity away from the unemployment benefit funds, which means that these transfers are often very limited.

A third factor that might limit the reduction of the procyclical bias in fiscal policy, even with regard to rules adjusted according to the business cycle, are the transfers made to subnational governments. These transfers are almost always defined as a fixed proportion of ordinary fiscal revenues, which means that they vary automatically and in direct proportion to the rhythm of the business cycle.[8] Consequently, the more subnational governments depend on such transfers, and unless a stabilization mechanism is established for them, the greater the procyclical bias of the fiscal policy.

A fourth factor that limits the stabilizing function of fiscal policy might arise for countries that depend on revenues from the export of nonrenewable resources. Frequently, variations in the international prices for these products bear no relation to economic cycles, because they can also be affected by geopolitical factors or other kinds of exogenous and unpredictable shocks. Therefore, countries that depend on resource revenues require specific rules, because automatic stabilizers will not prove sufficient to reduce the procyclical bias of fiscal policy caused by price variations that affect such a high percentage of fiscal revenues. In these cases, the most convenient course of action is to use a rule based on a budgetary aggregate, such as the primary or total balance, which, as well as being adjusted by the economic

[8] In the majority of countries in the region, these inter-governmental transfers are established within the national constitutions and/or fiscal laws of high juridical authority, such as organic laws or federal codes.

cycle, excludes revenues from nonrenewable resources. The degree that fiscal sustainability depends on this type of resource is also thereby disclosed. Furthermore, as these resources are nonrenewable, fiscal sustainability in resource-dependent countries requires ongoing generation of savings to support spending and borrowing levels, even after the resources run out or lose economic value because of technological obsolescence. Further, fiscal rules must be adjusted according to long-term intergenerational criteria by setting up sovereign savings funds that can also fulfill the function of creating short-term macroeconomic stability in response to fluctuations in resource prices (Villafuerte, López-Murphy, and Ossowski, 2010; Ossowski, 2013) (see Box 1.1).

A fifth factor is that, in general, structural rules, or those adjusted by the business cycle, leave the fiscal policy stabilizing role to the appropriate operation of the automatic stabilizers. By definition, structural rules do not consider discretional fiscal policies as long as the size and operation of the automatic

Box 1.1: Fiscal Stabilization Funds in Latin America and the Caribbean

Many LAC countries that generate significant fiscal revenues from the exploitation of raw materials have created stabilization funds. The funds are automatic safety mechanisms designed to attenuate the effects of price fluctuations of these basic products on fiscal accounts. They seek to stabilize public expenditures, whenever revenues display volatile or uncertain behavior (Marcel, 2013).

Stabilization funds operate under pre-established rules, accumulating additional revenues during price surges and financing necessary expenditures during declines. Deposits and withdrawals depend on attaining an outcome in relation to a specific trigger. Some funds center on price fluctuations in export products, whereas others mainly concentrate on fluctuations in fiscal revenues. An important challenge is to set the reference value that governs the withdrawals and deposits.

With the exception of Bolivia, all of the principle exporters of basic products in the LAC region have created stabilization funds. Chile, moreover, has followed a fiscal rule based on structural fiscal balance adjusted both to the business cycle and to the copper production cycle. Other countries in the region have rules, although not cycle-adjusted.

Chile established a fund for stabilizing the proportion of copper export revenues that the government is able to spend in one year. The Copper Compensation Fund operated

continued ⟶

Box 1.1: Fiscal Stabilization Funds in Latin America and the Caribbean (*continued*)

from 1987 till 2006, primarily to stabilize fluctuations in the real exchange rate and to regulate the availability of foreign currencies in the economy. From the 1990s onward, the fund focused on stabilizing fiscal revenues produced by the public sector copper corporation. With the enactment of its *Fiscal Responsibility Law* (FRL) in 2006, the fund was eliminated. The FRL consolidated the structural fiscal balance rule and created a single stabilization fund for all fiscal revenues.

Ecuador's FRL (2002) contained three fiscal rules aimed at balancing the lack of resources, the real expenditure growth rate, and public debt. Subsequently, these were modified and replaced by a non-oil-based Golden Rule (2008). There was also a series of stabilization funds with a set of rigid operational and deposit rules, which was finally abolished a few years ago.

Mexico has created a stabilization fund within the framework of its FRL. The execution of its rules depends on current oil prices with regard to budgeted prices. There is also a general balanced-budget fiscal rule (not business cycle-adjusted).

In Peru, the resources of the fiscal stabilization fund are accumulated according to the fiscal surplus at the end of each fiscal year. These resources can be used to service public debt once they surpass 2 percent of GDP. The FRL establishes various fiscal rules that are not adjusted by the business cycle.

In Trinidad and Tobago, the stabilization fund stipulates rules of execution that depend on real oil revenues in relation to the budgeted revenues.

Finally, Venezuela established its Economic Stabilization Investment Fund in 1998 to soften the impact of fluctuating oil revenues on fiscal accounts and on monetary and foreign exchange operations. In 2004, the fund was modified to stabilize public spending at the national, state, and municipal levels and became the macroeconomic stabilization fund. Subsequently, in 2007, the National Development Fund was created so that resources from oil revenues and other sources were used to finance investment projects, which left the macroeconomic stabilization fund with no practical role as a public expenditure stabilization mechanism. In Venezuela, the rules of execution based on oil prices are frequently modified when political circumstances and objectives change, which makes them difficult to monitor.

Source: Villafuerte, López-Murphy, and Ossowski (2010).

stabilizers are adequate. This constitutes both an advantage and a disadvantage. The advantage is that, by leaving the operation of the countercyclical mission to the automatic stabilizers, discretional policies become unnecessary and, consequently, confidence is maintained in the political economy and in the rule itself. However, this is only true if the shocks do not affect the normal evolution of the economic cycle; this is not the case for external shocks, natural disasters, and systemic financial crises, which are very easily propagated.

A sixth factor is technical complexity of cycle-adjusted rules, which is one of their most serious disadvantages. If such rules are to be implemented satisfactorily, the following components and procedures must first be established:

- Determine the structural and cyclical components of GDP. Ideally, this can be achieved using a production function that captures each economy's specific qualities. This presents complex statistical problems that many LAC countries do not have the capacity to resolve, particularly because they lack reliable data regarding capital stock. This restriction leads to the use of other statistics, which are not easily understood by a large part of the population.
- Estimate the elasticity of public sector revenues and expenditures.
- Calculate the automatic stabilizers in order to measure the countercyclical capacity of fiscal policy.
- Determine the most adequate fiscal aggregate on which the fiscal target can be established (primary or total balance), and the public sector area to which the target is to be applied (central or subnational government, or consolidated public sector).
- Identify the required size of the structural target (size of the surplus or deficit, or balanced budget), ensuring it is consistent with sustainability of medium- and long-term fiscal policy.
- Adjust the procedures and methodologies of budget formulation, debate, and approval, and ensure that budgetary execution is consistent with adequate compliance to the rule.[9]

Based on the technical complexities of business cycle-adjusted rules, many LAC countries are unwilling to apply them. Many budgetary institutions might lack the professional resources that these complexities warrant. Furthermore, these complexities can create doubts or suspicions about the rule's transparency and about the technical parameters applied, particularly in the political sphere wherein public budgets are debated and approved.

Finally, a fiscal rule might not even be necessary in certain circumstances. This might be the case in countries that already work well and have a high degree of confidence in their budgetary institutions, based on a long tradition of fiscal transparency, discipline, and sustainability. In these cases,

[9] For a detailed explanation, see Marcel (2010); Ter-Minassian (2010); IMF (2009d); and Fedelino, Ivanova, and Horton (2009).

a well-designed escape clause might be sufficient to increase the authorities' maneuverability in the event of shocks unrelated to the business cycle, or when faced with exceptional circumstances.

Escape Clauses

A fiscal rule must have sufficient flexibility to enable authorities to take action when faced with unforeseen and significant temporary shocks (e.g., natural disasters, external shocks, and financial crises). In this way, the authorities would not have to make frequent modifications of the rule, which can damage confidence in the rule itself and in the authorities' intentions to sustain fiscal policy.

These kinds of shocks are mostly temporary (lasting for a year or two), which means that any change to the law that upholds the rule would have to be totally or partially reversed once the shock and its effects have been resolved. Reversals, which can be difficult to achieve, may erode the credibility of fiscal policy and create unnecessary political friction. Obviously, if the shock is permanent, the target established by the rule, or the rule itself, will have to be modified to safeguard the purpose of long-term financial stability. Similarly, if the shock is insignificant, the authorities can adjust revenue and spending levels in the short term to comply with the rule's target, without needing to change the rule or create an exemption.

To prepare for unexpected and important shocks, escape clauses that allow for flexibility in terms of compliance can be included in the rule. However, escape clauses must satisfy certain conditions to prevent them from being applied on a discretional basis and to avoid undermining confidence in fiscal policy. These conditions are (i) a clear definition of the nature and magnitude of the shocks that can provoke application of the escape clause, (ii) a definition of the duration of the period of exemption from compliance with the rule, and (iii) a definition of a clause that reverses the accumulated deviation from compliance with the fiscal target that is produced during the exemption period.

The reversal of the accumulated deviation from compliance with the target is not a mere technicality, but rather an attempt to reestablish a debt-to-GDP ratio that is equal, or very near, to that which existed before the shock and was presumably consistent with fiscal sustainability. Reestablishing the debt-to-GDP ratio is crucial, because if the country is burdened with an appreciatively greater proportion of debt-to-GDP after the shock, it will be more vulnerable to future shocks, eventually threatening fiscal sustainability. This reversal must be conducted over several years to avoid concentrating the entire adjustment within a single fiscal exercise.[10]

The experiences of the United States and some European countries are instructive in this area. The international financial crisis surprised these countries by resulting in significantly high levels of public debt. The prolonged and acute recession produced a dramatic decline in revenues and increase in public spending because of the increase in unemployment benefits, as well as in other stimulus spending

[10] For further detail and analysis, see Ter-Minassian (2010) and IMF (2009d).

intended to reactivate economic growth. Furthermore, some of these countries were forced to rescue certain financial institutions with fiscal resources to avoid increasing bank failures. Consequently, fiscal deficit and public debt soared, creating a perception of high risk to fiscal sustainability. This perception deepened the economic recession because the financial uncertainty caused a significant decline in private investment, which further weakened growth prospects and fiscal sustainability. This process becomes a vicious cycle that is not easy to break.[11]

Finally, to reinforce the credibility and transparency of a fiscal rule, the escape clause must specify the level of government at which it can be activated (the executive or parliament level), as well as the agency responsible for monitoring both the exemption and the reversal periods. In this sense, the existence of independent fiscal offices, such as a parliamentary budget office, can help reinforce confidence in using escape clauses.

Many countries have established escape clauses to be invoked under very general terms, such as the occurrence of "exceptional" economic and social circumstances (Table 1.3). Therefore, the criteria that trigger these clauses are not clearly defined, and their application depends merely on discretional or political criteria. In the majority of cases, the clauses do not establish either the time frame for validity or the requirements to correct any deviation from the fiscal target that are considered consistent with the sustainability of public debt. This vagueness in defining and applying escape clauses could damage the credibility of fiscal policy in certain circumstances.

In conclusion, although the inclusion of escape clauses in fiscal rules can provide flexibility during unexpected and exceptional circumstances, such clauses must contain, in an explicit and transparent form, the criteria that give rise to their application, a definition of the duration periods of the exception in each circumstance, and the necessary period for reversing any deviation from the target in a way that is compatible with fiscal sustainability. These characteristics would consolidate the credibility and sustainability of fiscal policy, while at the same time endowing it with the flexibility needed under unstable conditions.

Correcting Deviations and Applying the Rule to the Budget

There are also less severe factors that can lead to noncompliance with fiscal rules. However, even if these deviations are of a limited magnitude, they must be corrected to preserve confidence in fiscal discipline. An optimal rule must also make explicit the adjustment or correction mechanism for any deviation that occurs during budgetary execution. Corrections should be made during this phase in order to ensure consistency with the fiscal target throughout the year (ex-post mechanisms) or during subsequent years (ex-ante mechanisms). In either case, it is important to establish the mechanism in the rule. The model

[11] For an illustration of the fiscal situation before and after the 2008–09 financial crisis in OECD countries, see Schick (2010).

TABLE 1.3: EXAMPLES OF ESCAPE CLAUSES IN A VARIETY OF COUNTRIES

COUNTRY	TYPE OF CLAUSE
Argentina	The authorities can increase certain expenditures in social and economic emergencies stipulated by the law.
Brazil	A 1 percent contraction in GDP or a natural disaster can trigger an escape clause, but the clause can only be invoked with the approval of congress.
Germany	If approved by a majority of parliament, the budget rule allows for exceptions in the case of a natural disaster or other exceptional emergency. However, a repayment plan is required in the case of exceptionally high budget deficits.
India	The escape clause included in the fiscal responsibility law allows the government to disregard the targets under any exceptional circumstances that the central government might specify.
Norway	Temporary deviations in the rule are permitted in response to significant changes in the value of the government pension fund.
Pakistan	An escape clause exists for security emergencies and for natural disasters.
Panama	The deficit ceiling for the nonfinancial public sector is set at 1 percent of GDP (excluding operation of the Panama Canal), but this can be disregarded if the real GDP growth rate is below 1 percent. In this case, the ceiling can be raised to 3 percent of GDP in the first year, and then gradually decreased over the following three years.
Spain	There is an exceptional circumstances clause.
Sri Lanka	There is an exceptional circumstances clause.
Switzerland	Parliament can approve, by a qualified majority, a deviation from the budget norm under exceptional circumstances.

Source: Ter-Minassian (2010), based on IMF (2009d).

of adjustment will depend on the circumstances in each country and the fiscal target pursued. For example, in Chile, the authorities want to send a clear message about fiscal discipline from the very beginning of the cycle, which means that corrections must be made during budget execution. In Switzerland, deviations must be corrected during subsequent budgetary exercises.[12]

Preconditions for the Design and Optimal Operation of Rules Adjusted for the Business Cycle

Given the technical complexity and the variety of objectives that cycle-adjusted rules can satisfy, it is convenient to analyze the conditions necessary for their optimal design and operation in terms of fiscal policy effectiveness, credibility, flexibility, and sustainability.[13] These conditions are even more important in the

[12] Marcel (2010) and Ter-Minassian (2010) present more detailed analyses of the correction of deviations.

[13] In reality, some of these conditions might be established simultaneously with the approval of a fiscal rule adjusted for the business cycle. However, if these conditions have already been fulfilled and, thus, fiscal policy credibility has already been improved and the authorities' reputation enhanced, the condition would significantly facilitate the political and social consensus needed to approve the rule, as well as strengthen confidence in the rule's operation and transparency.

case of LAC countries because of the existing limitations on the efficient operation of the automatic stabilizers described above. Most of these conditions are critical for the satisfactory operation of any kind of fiscal rule. However, given the technical complexity of cycle-adjusted rules, they are more challenging to fulfill.

Macroeconomic Conditions

1. Macroeconomic and financial stability, and the sustainability of public debt over the medium and long term. Countries with high levels of public debt and a marked bias toward deficits should make substantial efforts in terms of fiscal consolidation either before or at the same time of establishing a rule of this kind. Otherwise, the rule's credibility and sustainability will be under scrutiny.
2. Effective macroeconomic coordination between fiscal and monetary authorities, and convergence between their objectives, including on foreign exchange policy. The lack of convergence and coordination can produce contradictory results that tend to undermine the effectiveness of countercyclical policies.
3. Soundness of the financial and banking system, including a well-developed banking system safety network, legal and regulatory frameworks, and the institutions responsible for financial and banking oversight. Systemic banking and financial crises can disable fiscal rules by undermining fiscal sustainability and macroeconomic stability, as witnessed in the majority of developed economies during the 2008–09 financial crisis, and in various past episodes in the LAC region.
4. The operation and adequate size of the automatic stabilizers. Some factors that limit the smooth operation of these stabilizers do not depend on the will or the wishes of the economic authorities, but rather on structural factors that are difficult to correct in the short term. However, it is possible to reduce or remove these limitations over the medium and long term by, for example, improving the collection, structure, and progressiveness of the personal income tax, including by making transfers to subnational governments through ordinary mechanisms to stabilize countercyclical revenues and widening and enhancing unemployment benefits.

Fiscal and Budgetary Conditions

5. Compatibility between the fiscal rule and other fiscal and budgetary institutions, including budget and public credit laws, transparency and fiscal responsibility laws, and public financial administration laws.
6. Appropriate inclusion of public sector transactions and units in the fiscal and budgetary accounts, and the choice of an adequate and broad fiscal aggregate to ensure the effectiveness of the rule in terms of the sustainability and countercyclicality of fiscal policy.
7. The quality, frequency, and transparency of budgetary information, as well as the credibility of the institutions that deal with budget formulation, debate, approval, and execution processes. These

aspects also include determining or estimating the macroeconomic assumptions on which budget drafting and approval is based.

8. Compatibility of fiscal rules with the federal fiscal institutions, which includes inter-governmental transfers and any other fiscal agreements with subnational governments.
9. Convergence between the fiscal rule and budgetary design in the case of countries that export non-renewable resources, including the rules governing deposit and withdrawal for stabilization funds and intergenerational savings.
10. Documented and transparent registration of contingent liabilities and the provision of the necessary budgetary resources to cover them, without creating delays in payments or in floating debts that might eventually put the sustainability and credibility of fiscal policy at risk.
11. Adequate financial and administration information systems that (i) generate significant and timely fiscal management indicators that guarantee the quality, transparency, and availability of information regarding budgetary execution and the government's financial accounts and movements; and (ii) guarantee the payment of benefits and the collection of contributions for the unemployment benefit system.

If any of these preconditions are not fulfilled, there is a risk that the fiscal rule will be abandoned or suspended, or that its effectiveness will be undermined through the appearance of unexpected expenditures, the proliferation of quasi-fiscal activities outside of the budget, or a backlog in the payment of improperly accounted debt. Any one of these faults or deficiencies in political economy or budgetary management will affect the credibility of fiscal policy, the achievement of financial stability, and, eventually, the preservation of fiscal stability.

Complementarity with Other Institutional Mechanisms

The operation of business cycle-adjusted rules, as well as any other kind of fiscal rules, can be substantially improved when they complement other institutional designs, such as the following:

1. Medium-term budgetary frameworks. This kind of institutional design tends to reduce uncertainty about fiscal policy direction and, therefore, contributes to strengthening macroeconomic stability in general. At the same time, these frameworks can help reinforce fiscal sustainability if they establish certain budgetary restrictions on borrowing and ensure adequate resources are provided for those investment projects that are to be executed over many years. Even though these medium-term budgetary frameworks do not constitute a requirement for the cycle-adjusted rule to function, the mechanisms can complement each other to strengthen fiscal policy targets. For example, the structural fiscal target might be defined and reviewed within the context

of a pluriannual budget, which would be based on the expected values of structural or trend GDP over the medium term.

2. The transparency and credibility of a structural rule, given its high technical complexity, can be substantially reinforced through the existence of independent fiscal institutions, such as congressional budget offices, councils, or panels of independent fiscal experts, for instance those used in Chile. These institutions can corroborate the budget's macroeconomic parameters and some of the technical components on which the structural rules are based. Their independence and credibility can significantly increase the credibility and transparency of cycle-adjusted rules and reduce the limitations and information asymmetries that their technical complexity implies.

The Political Economy of a Structural Balance-Based Fiscal Rule

In general, establishing a fiscal rule calls for social and political consensus if the rule is to be sustainable and enduring. The more demanding the rule in terms of transparency and fiscal discipline, the greater the need for wider and more solid political consensus. This is even more necessary for a cycle-based rule given its technical complexity, the conditions that must be met for it to be credible and sustainable over time, and the complementarity it must share with other institutional mechanisms to strengthen the transparency and credibility of fiscal policy. Such consensus is difficult to achieve and depends on political, institutional, and cultural factors in each country.[14]

The first condition required to foster such consensus is a thorough understanding of this kind of rule. One action that facilitates knowledge and eventual adoption is the use of the structural fiscal balance as an indicator for evaluating the quality and sustainability of fiscal policy, in contrast to the observed or current fiscal balance. In fact, this was undertaken in Chile before the rule was legally adopted, which made the achievement of the necessary consensus highly likely. In this sense, the Chilean experience, where the structural rule has now been applied for 11 years, constitutes an exceptional example of healthy, effective fiscal policy, sustained by wide-ranging political and social consensus.[15] Some countries, such as Peru, already use this indicator as a reference without being obliged to apply it as a rule with specific targets.

The second condition, which is crucial, is that the rule must be established within a climate of political and economic stability. Chile, as mentioned, along with Brazil, Colombia, Mexico, and Peru present positive lessons. Their rules were adopted in politically stable contexts, and the political leaders intended to consolidate efforts toward economic stability and fiscal sustainability that had been achieved after years of economic reforms. In fact, one very critical factor that contributed to adopting fiscal rules

[14] See Ter-Minassian (2010) for more information and bibliographical references.
[15] See Marcel (2010).

in these countries was that the benefits of economic growth achieved over many years had already become apparent in the form of low inflation and financial and foreign exchange rate stability. The population overall enjoyed these benefits and, therefore, those laws that reinforced the institutional mechanisms necessary to make those benefits more enduring and safer encountered no resistance from the diverse social sectors, such as political parties, trade associations, and trade unions.

The best time to introduce these kinds of rules in the business cycle is in a period of stability or in its expansion phase. During these phases of sufficient or abundant resources, the government sends a clear signal of intent regarding fiscal discipline, which improves the authorities' credibility and reputation and, thereby, facilitates the building of consensus. If such rules are proposed during a contraction in the cycle, some might suspect that the government's motive is to establish a higher ceiling for spending, which could cause a lack of confidence in the true intention behind the proposal.

In the case of Brazil, there was a lengthy period of consultation in 1999 and 2000 before its FRL was adopted. Given that this law directly affected the state governments, some prior agreements at the regional level were needed for its approval. The law was successful because it reestablished fiscal discipline at both the federal and subnational government levels. Although it is not really a cycle-adjusted rule, fiscal discipline turned out to be crucial to achieving macroeconomic stability and debt reduction as a result of significant primary surpluses.[16] In mid-2011, Colombia adopted a structural balance-based rule, with a transition period until 2015 to achieve implementation of certain prior conditions and to make the necessary adjustments to various regulations.

Mexico and Peru do not have structural balance-based rules, but their current rules require ample political agreement. Mexico's rule demands budgetary equilibrium, but it also has an exemption clause for extraordinary circumstances. In fact, it is one of the few countries in the LAC region that had one of these clauses in place before the 2008–09 financial crisis. The rule also has an oil revenue stabilization fund. Fiscal discipline, achieved some years after the effects of the 1994 crisis were surmounted, was ratified by the new rule approved in 2007, which has enabled the country to considerably reduce its public debt (mainly debt denominated in U.S. dollars), and refinance the remaining balance over longer repayment periods. Peru's rule displays various important elements, particularly with regard to limits on expenditure growth and subnational government discipline, which has also enabled the country to enjoy a prolonged period of fiscal discipline, growth, and financial and macroeconomic stability, as well as a considerable reduction in public debt.[17]

Two other very instructive examples are Argentina and Venezuela, although, lamentably, in the negative sense in terms of the sustainability of their fiscal rules. In Argentina, various fiscal rules have been

[16] See Ter-Minassian (2010) and Levy (2010).
[17] See Esquivel (2010), Jul (2010a), and Levy (2010).

implemented, even before the financial and fiscal crisis of 2001, but they have not been respected. During the following period of political and economic instability, new fiscal rules were established, which did not achieve their objectives and, after a short while, were reformed or abolished.[18] In Venezuela, various kinds of rules have been inaugurated to stabilize oil revenues and reduce the procyclical nature of fiscal policy since the country boasts one of the highest levels of economic volatility in the region. These rules have been changed too often. The first attempt at establishing a macroeconomic stabilization fund occurred between 1997 and 1998, when a law was approved using a mechanism of temporary and extraordinary legislative powers that congress bestowed on the executive office—the so-called facilitating law. The law was approved without the necessary consensus and was modified two years later when the country's political direction changed. Subsequently, this law has been reformed on various occasions, but fulfills no practical purpose.[19]

Another vitally important element of political economy to be considered when establishing a structural balance-based rule relates to subnational governments. In this sense, the political and social consensus requires the inclusion of regional political factors, including, apart from political parties, the governors and mayors, the states or department legislative assemblies, and the parliamentarians that represent the states, departments, or provinces at the national or federal legislative level.

Recently, in some cases in the LAC region, the lack of a clear and transparent definition of how subnational governments would be incorporated into a rule's operation, with regard to the accumulation and use of the savings gained from resources arising from inter-governmental transfers throughout the business cycle, has been an impediment to building consensus. These mechanisms must be entirely transparent given that, if the regions perceive they might be the object of a land-grab, or have restrictions put on resource use that go beyond the normal evolution of the business cycle, they will openly oppose the adoption of such rules.

Finally, the region's abundant nonrenewable natural resources must also be considered in establishing fiscal rules in general, but even more so if they are cycle-adjusted rules. Seven countries, which combined represent roughly 45 percent of GDP and nearly 60 percent of the entire region's exports, fall into this category. Further, Brazil, which is not included in this group, will probably become an oil-exporting country in the coming decades. This characteristic can modify these countries' conduct in various aspects. There is a wide range of literature on the subject, although experts in the region seem far from reaching a consensus.[20]

[18] See Braun and Gadano (2007) and Rivas (2010a).
[19] See Villafuerte, López-Murphy, and Ossowski (2010).
[20] For further discussion, see Eifert, Gleb, and Tallroth (2003); Van der Ploeg (2010); and Collier and Venables (2011).

The first aspect that seems clear is the displacement of fiscal resources other than those arising from nonrenewable resources, which means that these countries are highly fiscally dependent on these resources, with a lower burden on other taxes.[21] A lower tax burden reduces society's demand for greater accountability and transparency from public authorities, which, in turn, translates into weaker and less transparent institutions.

If the above-mentioned circumstances are true, then these countries will never become candidates for establishing cycle-adjusted fiscal rules. Though the literature demonstrates that there is a displacement effect on fiscal revenues, it would be a mistake to jump from there to the different conclusion, given that institutional quality depends on another combination of very important factors, such as the society's cultural make-up, the quality of political and social leadership, and the maturity of democratic institutions.

Once more, Chile is a clear example that counters this argument because its economy depends on revenues from copper (nearly 25 percent in recent years as a result of an upsurge in prices for raw materials), but its fiscal rule has functioned successfully. Colombia, which is displaying a tendency of increasing oil-based revenues, has approved a rule similar to Chile's.

As previously discussed, an even more complicated political economy issue for countries that depend on nonrenewable resources is the decision whether to create a stabilization and intergenerational savings fund. Beyond the merely technical decision, the choice between saving for future generations or spending as soon as resources are available involves many political and social factors, including interest groups that might influence the decision about when and what to spend. From the perspective of intergenerational fairness, the correct decision seems perfectly clear. However, saving for future generations implies an opportunity cost in terms of investment in development projects that might enhance an economy's potential growth. Moreover, the final result might be the same or better than putting the resources into an intergenerational savings fund. In a context of low interest rates on the international markets, which has been the case in the almost every year of the current millennium, this is even more likely to be true. On the other hand, many countries rich in nonrenewable resources have not had positive experiences with development projects carried out by the state, because many of these investments have been made inefficiently and at high costs. The debate between experts on the subject ensues.[22]

Beyond the intergenerational savings funds, there are significant reasons in favor of creating stabilization mechanisms for nonrenewable resource revenues, given that these resources are highly volatile and contribute to creating a marked procyclical bias in fiscal policy. The macroeconomic volatility that

[21] See Bornhorst, Gupta, and Thornton (2009); Bustos and Perry (2011); and Ossowski and González (2012).
[22] For further discussion, see García, Easterly, and Yuravlivker (2008); Van der Ploeg and Venables (2008); and Venables (2010).

generates this procyclicality implies high costs in terms of growth. However, interest groups and political factors also affect this decision, because a decision of this nature implies a bid to secure a share of the revenues earned from these resources, rather than the payment of taxes by taxpayers.

Additionally, there are differences in the intertemporal perspectives between an administration that receives the benefits of a surge in prices for these products and a sector of society that prefers the option of future expenditures, when conditions are less favorable. In setting up a savings fund, the present government is postponing the decision to spend resources, and thus the decision could end up in the hands of future governments. Given the uncertainty of their time in office, it is only to be expected that the governments spend as soon as they receive the benefits of the price rise. These differences on intertemporal preferences, and the presence of interest groups that compete for a share of the revenues, often hamper the creation and effective operation of macroeconomic stabilization funds in these countries.

Finally, all oil-producing countries implicitly subsidize the price of combustibles in their own internal markets. These hidden subsidies are not registered as costs nor are they approved in the annual budget exercise, despite the fact that they constitute substantial amounts and represent a high opportunity cost for investment projects or spending on healthcare or education to improve human capital and enhance the equality of social opportunities. As a result of the rise in raw material prices in recent years, and especially in prices for hydrocarbons, it is estimated that that these hidden subsidies amount to between 7 and 8 percent in Ecuador and Venezuela.[23]

The economic efficiency and fairness of these subsidies is also highly questionable, despite the fact that, in some way or other, all sectors benefit in some proportion from them. The lower-income sectors benefit through lower collective transport tariffs, and private vehicle users benefit directly from lower petrol prices. Further, all citizens benefit from lower costs of the transportation of goods. However, in per capita terms, the private vehicle owners benefit the most.[24] The fiscal transparency implied by a structural balance-based rule should reveal these subsidies, but this is a very politically and socially sensitive matter in these countries. In fact, elimination of these subsidies cannot be achieved without the creation of a compensation mechanism for the lower-income groups, both from a fairness perspective and to ensure the viability of the fiscal rules, among other factors.

In conclusion, political economy factors play a primary role in deciding whether or not to adopt a fiscal rule and, further still, a rule based on structural balance. Compliance with the necessary preconditions that guarantee the sustainability and credibility of this kind of rule, particularly with regard to the transparency of fiscal and budgetary accounting, and the specification of the macroeconomic criteria that

[23] See Ossowski and González (2012).

[24] See García and Salvato (2006) for Venezuela's case, and Ossowski and González (2012) for the region as a whole.

underpin the formulation and approval of the budget, are fundamental for creating the consensus needed, including among subnational governments, to adopt a rule of this type. The existence or establishment of independent fiscal institutions, which can significantly help strengthen fiscal policy transparency and credibility, will facilitate the creation of such consensus. Likewise, as the experience in Chile—a country rich in nonrenewable resources—demonstrates, the use and frequent debate of the fiscal balance, adjusted by the cycle as an indicator of fiscal policy sustainability and quality, will enhance understanding of the rule and, therefore, foster the creation of a favorable climate for building consensus.

THE CHILEAN EXPERIENCE[25]

In May 2000, following the fierce controversy about fiscal policy direction that arose during the 1997–99 Asian Crisis, President Ricardo Lagos announced to congress his intention to apply a fiscal rule based on the structural balance. The rule adopted comprises three basic elements: (i) a consolidated central government structural balance indicator, (ii) an annual target, and (iii) a methodology applicable to budget formulation and execution. Adoption of the fiscal rule during its first years of validity was justified by a series of macroeconomic and fiscal risks that can be grouped under three headings:

1. *Macroeconomic risks* arising from the Central Bank's operational deficit and from the financial vulnerability associated with exchange rate volatility, since a large share of long-term public and private debt was denominated in foreign currency.
2. *Fiscal risks* derived from contingent fiscal liabilities, including state guarantees to deposits, the guaranteed minimum pension for those affiliated with the individual capitalization pension plan, and guarantees of minimum revenues or traffic in the infrastructure concession contracts.
3. *Business cycle and fiscal risks* that emerge due to the volatility in fiscal revenues derived from copper as a source of public financing linked with nonrenewable resources.

To mitigate these risks, the authorities' initial option was to apply the structural rule ex-post and to exclude escape or exemption clauses to strengthen the rule's credibility. (The methodological detail of the rule at the time it was adopted compared to the present is presented in Table 1.4.) In order to implement the structural balance rule, structural revenue estimates need to rely on the basic estimates of trend GDP and the price of copper over the long term, which is provided by independent panels of experts. This

[25] This section is a synthesis of the analysis presented in Marcel (2010).

TABLE 1.4: METHODOLOGY FOR ESTIMATING STRUCTURAL BALANCE IN CHILE

COMPONENT	ORIGINAL METHODOLOGY	ACTUAL METHODOLOGY (2009)
Effective balance (B)	Cash-based central government budgetary balance, with reclassification to reflect net worth variation (corrected balance).	Consolidated central government balance (budgetary and extra-budgetary) on the basis of MEF 2001 (net acquisition of assets by government operations).
GDP (Y)	Total GDP based on market prices in national accounts — base year 1996.	Total GDP based on market prices in national accounts — base year 2003.
Revenues from copper (C)	Physical sales by CODELCO.	Physical sales by CODELCO. Income tax revenue collection and additional tax on the 10 leading mining companies. Specific tax collection (royalties) on private sector mining.
Tax revenues (T)	Total tax revenues plus social security contributions.	Tax revenues, less income tax and additional tax on the 10 leading mining companies, less specific tax collection (royalties) on private sector mining, plus social security contributions.
Elasticity of revenues from tax collection (μ)	Aggregate elasticity of total tax revenues, plus social security contributions with respect to GDP.	Disaggregated elasticity for five types of taxes — annual income, monthly income, PMP, indirect taxes, other taxes — and health contributions.
GDP Trend (Y*)	Estimated based on production factor using the Stock-Watson methodology. Factors of production corrected according to quality. TFP obtained as a residual. Hodrick-Prescott filter to soften fluctuations in factors of production and TFP. Out-of-sample observations obtained from estimates drafted by the treasury.	Estimated based on production factor using the Stock-Watson methodology. Factors of production corrected according to new indicator of capital use rate, variable depreciation rate, hours worked, and quality of education. TFP obtained as a residual. Hodrick-Prescott filter to soften fluctuations in factors of production and TFP. Out-of-sample observations obtained by consultations with a panel of independent experts.
Real copper price (P_{Cu})	Average FOB price of CODELCO exports.	Average FOB price of CODELCO exports; LME price for taxes on large private mining companies.
Long-term copper price (P_{Cu}*)	Reference price of the Copper Compensation Fund estimated by the treasury.	Long-term copper price, estimated by a panel of independent experts as an average for the next 10 years.
Revenues from molybdenum	Not considered.	CODELCO revenues arising from the sale of molybdenum, corrected by difference from long-term prices, calculated as a mobile average over the last four years.
Interest received	Not considered.	Interest derived from the treasury's financial assets, newly calculated based on the nominal long-term interest rate.
Other revenues	Not considered.	Operating revenues, diverse property revenues, and interest and capital gains from financial assets held in sovereign funds for which a single elasticity with respect to GDP is supposed.

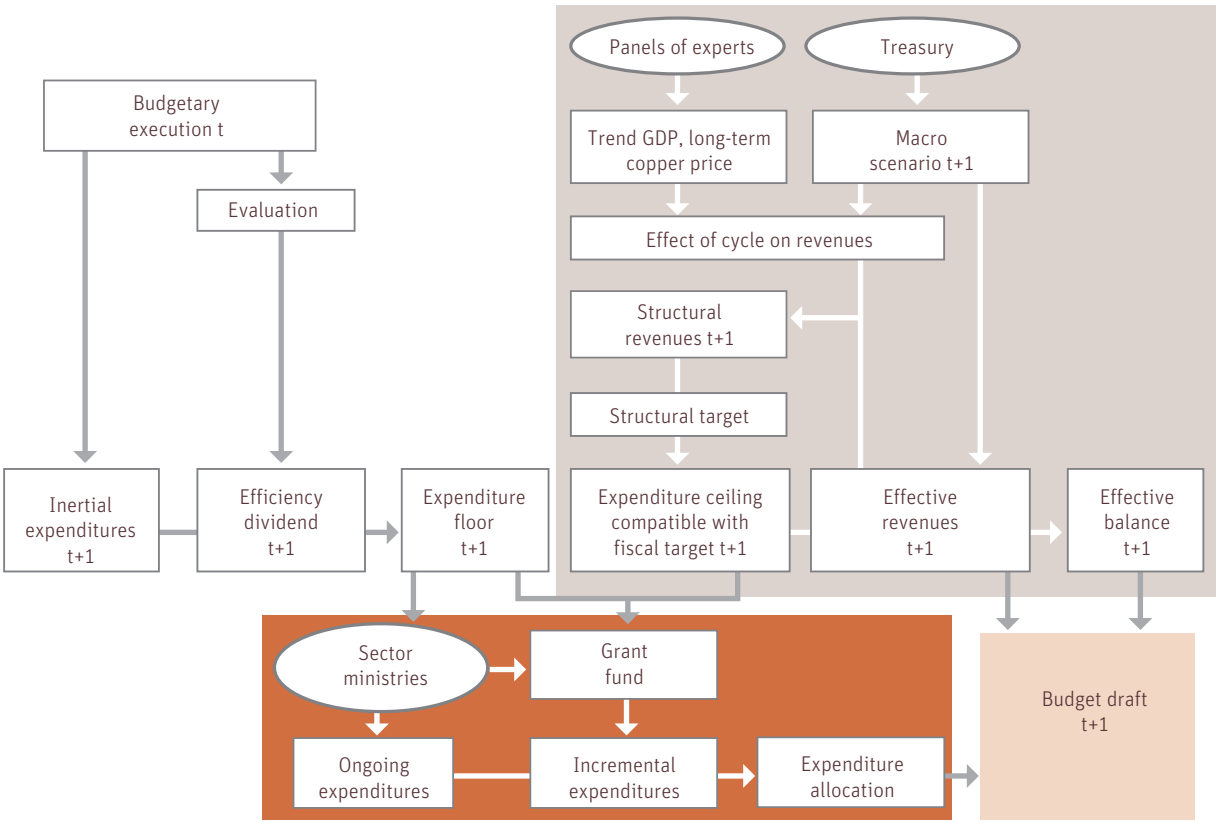
Source: Marcel (2010).

CODELCO = National Copper Corporation (Corporación Nacional del Cobre); PMP = provisional monthly payments; TFP = total factor productivity; FOB = free on board; LME = London Metal Exchange.

means that the level of expenditures in a given period does not depend on real tax revenues and its short-term macroeconomic determinants (e.g., economic activity, copper prices, inflation, and interest rates), but on the level of structural revenues over the long term. Therefore, the rule is not exposed to debate during budget formulation within the executive office or during the subsequent parliamentary debate.

In this way, under the structural fiscal rule, the budget project becomes structured around four main components: (i) an estimate of effective revenues defined according to the macroeconomic scenario; (ii) the total expenditure level, determined by application of the rule, based on the structural revenues; (iii) the balance obtained from the difference between the two previous aggregates; and (iv) the distribution of expenditures, which includes both incremental and ongoing expenditures (Figure 1.5).

FIGURE 1.5: BUDGET FORMULATION UNDER THE STRUCTURAL BALANCE RULE



Source: Marcel (2010).

Compliance with the structural target is especially commendable, given the significant fluctuations in the effective balance produced by the business cycle and the price of copper in recent years. These fluctuations were significant especially in the period 2006–09, because of the boom in prices for raw materials that occurred until mid-2008, followed by the sharp decline in the ensuing international financial crisis.

During the boom period, the Chilean authorities had to fight to contain the political pressure for higher expenditures against a backdrop of rising assets accumulating in the sovereign funds. In spite of this pressure, between 2003 and 2008, the primary balance was an average surplus of 3.9 percent of GDP. The 2008–09 crisis confirmed the rule's value, enabling the authorities to pursue a markedly countercyclical policy, in line with a deficit of 8.5 percent of GDP in 2009. Application of the fiscal rule significantly reduced the volatility of consolidated central government spending in comparison with previous periods. There is also empirical evidence of a reduction in the volatility of GDP growth, despite the increase in external shocks that the Chilean economy has faced since the rule's adoption. Furthermore, the adoption of the rule reduced the risk factors in the economy. The systematic generation of structural and effective surpluses significantly reduced public debt and, consequently, interest rates and refinancing risks. While the rule was in force, Chile's "spread" according to sovereign risk also fell sharply, both in absolute terms and in relation to other emerging economies.

In synthesis, the Chilean experience has offered 10 key lessons for establishing a structural balance rule, associated both with articulating and perfecting the rule itself, and with the macroeconomic effects of its application (Marcel, 2010).

Lessons Learned from Articulating and Perfecting the Rule

1. A good fiscal rule must be measurable and open to evaluation.
2. The effectiveness of a structural balance rule rests on its credibility.
3. The credibility of a fiscal rule depends on its transparency and predictability.
4. A fiscal rule must to be easy for citizens and politicians to understand.
5. Although a fiscal rule requires stability, it must also be open to improvements; limits to the methodological adjustments are set by transparency, conceptual coherence, and intertemporal consistency.
6. One way of protecting the fiscal rule's stability is to admit that certain circumstances justify overriding the rule on an exceptional and temporary basis.
7. Only some emerging countries have the conditions to adopt a structural balance rule.

Lessons Learned from the Macroeconomic Effects of the Rule's Application

8. The structural fiscal balance rule generated a virtuous circle that contributed to strengthening public financial management.
9. The structural balance rule is more effective for stabilizing public expenditures then for stabilizing GDP.
10. The structural fiscal balance rule provides flexibility to respond to the business cycle but does not limit the range of responses that may be needed to implement economic policy.

OTHER CASES IN THE LAC REGION

The IDB's review in 2010–11 clearly reflected the heterogeneous nature of fiscal policy in the LAC region, both with regard to institutional budgetary design and to compliance, or otherwise, with the prerequisites that must be put into place before a structural fiscal balance-based rule can be implemented. In general, only a few countries are sufficiently prepared, from economic and institutional perspectives, to adopt a rule with these characteristics. This group includes countries that have an acceptably solid fiscal position, with relatively efficient systems of regulations and budgetary procedures, and transparent and efficient information and financial management systems. These countries also enjoy stable macroeconomic and financial conditions and could, therefore, adopt a structural balance-based rule within a relatively short period of time. Fundamentally, the group includes Brazil, Colombia, and Peru, although they would all need to make some adjustments to their budget policies.

In Brazil's case, one of the difficulties is the high proportion of revenues already earmarked for certain expenditures, which introduces rigidities into fiscal policy management. Likewise, as it is a country with a high degree of fiscal federalism, the introduction of a business cycle-based rule would call for adjustments in the coordination mechanisms between subnational governments. Also, in recent years, some operations have been introduced that have weakened fiscal transparency with regard to the standards set out in the International Monetary Fund (IMF) *Manual on Fiscal Transparency* (IMF, 2007; Levy, 2010).

For its part, Peru has a very good chance of establishing a business cycle-based rule (Jul, 2010a). Peru has made significant progress in consolidating its fiscal policy and improving transparency and financial information in the public sector, although there is room for improvement. Furthermore, it also has a fiscal rule, approved as part of the *Fiscal Responsibility and Transparency Act,* which—although not adjusted by the business cycle—establishes the following: a fiscal outcome; a spending ceiling for central

government; additional restrictions on expenditures and borrowing during electoral periods; rules governing borrowing by subnational governments; a stabilization fund for the revenues derived from privatizations, mining and hydrocarbons concessions, and budget surpluses; and escape clauses and correction mechanisms.

The principal challenges that Peru faces in order to implement a business cycle-based rule are twofold: (i) the integration of revenues derived from nonrenewable resources (minerals) with a rule of this nature, and (ii) the inclusion of the fiscal relations with subnational governments, particularly the federal distribution of revenues arising from mining activity. It is worth highlighting that Peru's Central Bank has used the structural fiscal outcome as a reference for many years when drafting its reports to congress and the public on the evolution of inflation and monetary policy, which signifies that the main political and economic actors are familiar with the concept.

Uruguay is also a good candidate for establishing a cycle-adjusted rule over the medium term. However, this would require important improvements in terms of transparency and the quality of budget information, which includes all the fiscal and financial information of public sector corporations, as well as other state entities that occupy a predominant position in the consolidated public sector, such as the Social Insurance Bank (Banco de Previsión Social). Uruguay has made advances in fiscal consolidation since the 2001 financial crisis. It could begin to use the fiscal outcome adjusted by the business cycle as an indicator of fiscal policy, accompanied by an agenda of institutional reforms to satisfy the aforementioned preconditions that would enable the country to adopt a rule of this type (Le Fort Varela, 2010a).

A further group is made up of the countries that, although they have relatively efficient information and financial management systems and adequate budgetary systems, would need to make major fiscal consolidation endeavors before a business cycle-adjusted rule could be adopted. Costa Rica and Mexico are in this group.

In Costa Rica's case, there has been a notable deterioration in public finances because of sustained growth in expenditures and the earmarking of public revenues for predetermined purposes. These practices reduce fiscal policy flexibility and generate a pro-deficit bias that has, in recent years, produced a significant increase in public debt (Rivas, 2010b).

In Mexico's case, in spite of the appreciable progress registered in fiscal consolidation following the 1994 fiscal crisis, the country has significant fiscal challenges ahead. First, oil revenues, which make up one-third of all public sector revenues, will be affected over the medium term by a fall in oil production and an increase in internal consumption of gas. Second, the level of non-oil-based revenues is very low (between 10 and 11 percent of GDP), which places Mexico in an unfavorable situation compared to other countries in the region with similar levels of development. This low revenue is a result of a very narrow tax base caused by the proliferation of tax breaks and exemptions applicable to the two most

important taxes: value added tax (VAT) and income tax (ISR). In this context, the country's fiscal sustainability will require a substantial tax system reform over the medium term. Furthermore, Mexico suffers from some faults in its fiscal federalism, given the limited taxation facilities and transparency shortcomings in the states' public finances (Esquivel and Peralta, 2010).

Argentina and Panama are special for different reasons. In Argentina, there is a long history of abandoning and modifying fiscal rules because of a series of financial crises and the unsustainability of public debt. In fact, there are problems associated with the failure to honor public debt payments in 2001 that have yet to be resolved. Finally, the country has also imposed market-distorting duties, such as export retentions or tariffs (Rivas, 2010a).

Panama is a special case because of the preponderance of fiscal revenues from the canal. Canal activity has encouraged the development of a widely diversified service sector, alongside the international banking activities that have a long history in the country. In fact, services represent three-quarters of GDP. In recent years, Panama has made significant efforts to limit fiscal deficit and reduce public debt. It also has a good public financial management system, and the legal framework for the budget has improved considerably. Furthermore, dollarization of the economy and the service base associated with canal activities, as well as international banking, endow the country with great financial stability and low inflation levels. The extension of the canal will promote even further growth in the service sector, while at the same time guarantee a substantial future increase in a stable and safe source of revenue. Panama applies a fiscal rule that limits the budget deficit and establishes a net debt reduction target. The rule also has an escape clause, as well as a correction mechanism for returning to the original targets after the shocks prompting its application have been overcome. Fiscal revenues, whether from the canal or not, are generally very stable. This means that the observed fiscal balances and those adjusted by the cycle are practically the same. For these reasons, the country does not need a structural balance-based rule but, rather, a rule that guarantees the sustainability and credibility of fiscal policy without the technical complexities that a cycle-adjusted rule entails. The current version of the FRL fulfills these objectives (Jul, 2010b).

Trinidad and Tobago used the surge in raw material prices in the mid-2000s to improve its fiscal outcomes and reduce public debt. However, the country still has some way to go in improving the quality and transparency of public sector budget and financial information. There is an intergenerational savings fund, but the rules governing revenue accumulation and use are not explicit. Given the present levels of hydrocarbon reserves and the current rate of production, Trinidad and Tobago could exhaust these resources within a period of approximately 15 years. Therefore, it should establish a rule that includes a stabilization and intergenerational savings fund.

The Bahamas and Barbados both display high levels of indebtedness, marked procyclical biases in fiscal policy, and narrow tax structures. Furthermore, both are competing in the Caribbean for the same

market (tourism), which is highly dependent on the U.S. and European economies. Moreover, as they are situated in the Atlantic hurricane zone, they are extremely vulnerable to natural disasters. Therefore, these countries should make substantial efforts toward fiscal consolidation, diversifying and widening the tax base, and increasing budget transparency and quality before considering the establishment of a cycle-adjusted rule (Villasmil, 2010a, 2010b).

CONCLUSIONS

The economic and financial crisis of 2008–09 revealed a great deal about the evolution of public finances in the LAC region, and the possibilities of improving and strengthening fiscal policy. First, the majority of the countries in the region have improved their fiscal outcomes and the institutional framework of public finances. Second, with a few exceptions, compared with previous decades, the procyclical bias of fiscal policy has been reduced over the last 10 years. Third, despite these positive results, the crisis highlighted the need to further improve the institutionality of public finances in order to strengthen the stabilizing capacity of fiscal policy and increase the authorities' margin to counteract exogenous shocks, buttress credibility in macroeconomic policy, and consolidate fiscal sustainability over the medium and long terms.

Fiscal rules can help achieve these objectives if they are well designed. However, some rules can exhibit a clear procyclical bias that, rather than improving the stabilizing role of fiscal policy, contributes to propagating the effects of the shocks. This is one of the lessons that became evident during the 2008–09 financial crisis in both Europe and the LAC region.

Fiscal rules based on structural budget balances can contribute simultaneously to strengthening fiscal policy's stabilizing role and enhancing confidence in macroeconomic policies. However, in order for a rule of this nature to be effective, credible, and sustainable over time, it must satisfy certain prior economic and institutional conditions, and fulfill certain technical characteristics that can guarantee its credibility and effectiveness. In this sense, the Chilean experience of applying structural balance-based rules during the past decade offers important lessons.

A rule of this type must be established only after efforts to improve the sustainability of fiscal policy and the credibility of macroeconomic policy, in general, have been consolidated. Otherwise, there is a high risk of early abandonment of the rule, with consequent damage to the credibility of fiscal policy. It is also worth highlighting that adopting a structural balance-based rule is not a prerequisite for optimal fiscal policy. Those countries with a long tradition of fiscal discipline and sustainability, and with solid institutional frameworks, do not necessarily need to adopt a rule adjusted by the business cycle, especially if their automatic stabilizers are of a sufficient magnitude and function satisfactorily. In these cases, the inclusion of a well-designed escape clause in the terms described above might be sufficient to protect fiscal institutions in the face of significant exogenous shocks not associated with the business cycle.

The adoption or establishment of a structural balance-based rule or adjusted by the business cycle calls for ample social and political consensus.[26] The technical complexity of this kind of rule can lead

[26] Adopting any kind of fiscal rule will always require a certain degree of social and political consensus, and even more so if the rule is restrictive.

to opposition. One way of increasing understanding is to use the cycle-adjusted fiscal outcome as a referential indicator of fiscal policy quality and sustainability. Debate and dissemination of this indicator would improve its usefulness and significance as well, thereby generating a consensus for its eventual application. The existence of independent fiscal institutions, such as congressional budget offices, councils, or independent panels of fiscal experts, would significantly help achieve this target.

Finally, the extensive use of a business cycle-adjusted fiscal indicator might help to improve the institutionality of fiscal policy. Fulfilling the preconditions that must be met before a cycle-adjusted rule can be adopted, and approving and articulating the institutional mechanisms that must complement it, constitute in themselves an ambitious agenda of structural fiscal reforms. Realizing this agenda would substantially improve the quality and credibility of public finances in LAC countries, even if this kind of fiscal rule were not ultimately adopted.

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CHAPTER 2

The Performance-Based Budget for Improving the Quality of Public Expenditures

Mario Marcel, Juan Pablo Martínez, and Mario Sanginés

- The performance-based budget (PBB) seeks to enhance efficiency and transparency in public policy and resource management, and to strengthen State institutions.
- The PBB is based on four pillars: generating information to evaluate performance; adjusting the budgetary process; incentivizing public sector officials; and developing institutional capacity.
- In the Latin American and Caribbean (LAC) region, there are many obstacles to developing the PBB, including fiscal volatility, budgetary rent-seeking by sector or regional interests, and the uneven division of State powers. Despite this, some countries have successfully managed to progress toward PBB implementation.

A BEACON FOR PUBLIC EXPENDITURES

The Role of the Budget

The budget fulfills a fundamental role as a guide for public sector management. It not only organizes and regulates public expenditures, but also provides a gauge for measuring all subsequent government activities, given that the budget is the result of political and technical processes.

The way the budget is formulated, executed, and evaluated determines, to a large extent, the impact of public policies. For example, it is very difficult for a social protection program to achieve its inclusion or targeting goals if the resources allocated to it are misspent in activities that bear little relation to the service provision chain, continue to support components that have already outrun their usefulness, or do not benefit the target population. As the budgetary process is the vehicle whereby this type of program is implemented, it must generate information about the efficiency of its diverse elements and, under clear criteria, redirect resources intelligently in order to maximize results.

Unfortunately, this is no easy task. The budgetary process has substantial technical requirements, as well as barriers caused by institutional inertia (or lack of political will) that hamper budget implementation. The budget has three principal functions: (i) to harmonize the different political positions held by the actors involved in budget drafting who represent various sectors of the population and have differing considerations with regard to government priorities; (ii) to limit the scope of government activities

(which are not normally subject to the usual limits that the market imposes on the private sector); and (iii) to consider economic factors, such as prioritizing public spending according to technical considerations and the macroeconomic impact of government activity.

These functions can sometimes conflict with one another. For example, whereas the budget debate might result in a decision to increase or decrease resources for a particular government agency, a technical analysis might determine that this decision would be counterproductive to economic development. Figure 2.1 summarizes the aims of the budgetary process.

The budgetary process must be undertaken in a cycle that allows it to continually evolve toward these objectives (Figure 2.2). This cycle involves all of the processes, from structural budget planning to post-execution evaluation, and is repeated each year, incorporating past information to ensure continuous improvement.

The budgetary cycle begins with the planning phase. In this phase, the main objectives for the following financial year, which ideally are linked to short- and medium-term strategic planning, are set out. The formulation phase consists of sending the draft budget to the executive or legislative branch. After analysis and debate, further modification and subsequent approval of the budget is in the hands of the legislative branch. Once the budget has been approved, it is executed throughout the corresponding financial year. Finally, the cycle is completed by analysis and evaluation of public expenditure outcomes. This evaluation is used during planning for the following fiscal year, thereby providing continuity to the process.

FIGURE 2.1: OBJECTIVES OF THE BUDGETARY PROCESS

Macroeconomic effectiveness

- Achievement of macroeconomic objectives associated with the impact of public expenditures on the economy

Efficiency and effectiveness in resource allocation

- Appropriate resource allocation at the lowest possible cost
- Resource allocation that reflects citizen priorities and preferences

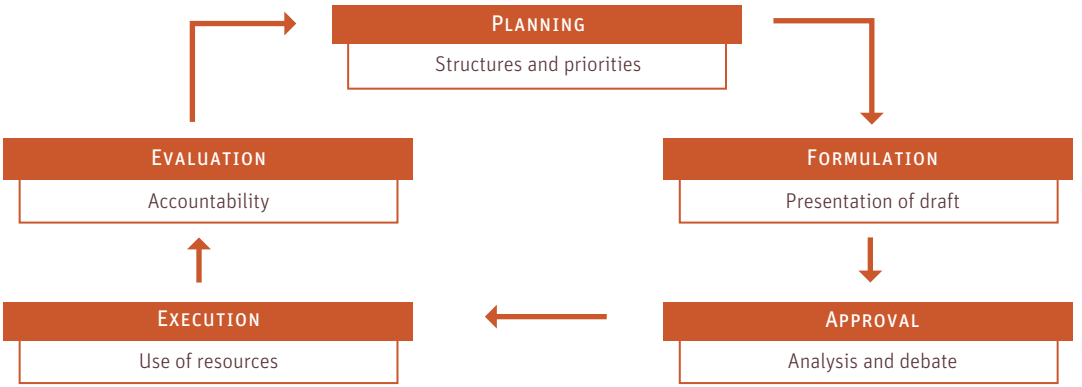
Efficiency and effectiveness in resource use

- Optimization of public resources to achieve the greatest possible number of goals and objectives

Transparency in fiscal resource management

- Accountability to citizens with regard to the allocation and use of public resources

FIGURE 2.2: THE BUDGETARY CYCLE



Early Budgetary Models

The first acknowledged budgetary model is known as incrementalism. This model, introduced halfway through the 20th century as a practical way to manage the budgetary cycle, continues to be widely used worldwide. This model involves marginally modifying the budget each year, increasing or decreasing the previous year's budget allocations by a certain percentage. These decisions are relatively simple, and they shorten the political debate and approval processes.

However, as incrementalism conceives the stages of the budgetary cycle to be mere bureaucratic steps, it fails to take advantage of the benefits that can result from decision making based on the aforementioned framework of objectives (Figure 2.1). Furthermore, incrementalism does not solve the following market problems:

- *The principal-agent problem*. This problem arises when differences exist between the goals of those who make the decisions and those who execute them. During the budgetary process, the problem occurs between the authorities that debate and approve the budget and the bureaucrats that put it into practice. To solve this issue, the goals must be clear and mutual, and civil servants need incentives to encourage them to identify with and take an active interest in budget execution.
- *Common fund or kitty*. This problem arises when resources gathered from a wide tax base can be used to benefit smaller interest groups. This drawback can be accentuated by the political process but can also be counteracted with greater transparency.

- *Intertemporal inconsistency*. This problem occurs when decisions are made in the present that will negatively affect the future. This happens, for example, when profits are taken in the short term by postponing costs into the long term, or when there are rigidities in resource allocation, such as a commitment to spending a certain percentage of fiscal revenues on education.

During the second half of the 20th century, two alternative models to incrementalism were developed to rectify its shortcomings: the program-based budget and the zero-based budget. The program-based budget separates government activities into programs and, thereafter, prioritizes resource allocation between them. This budgetary model was the first to use specific objectives and goals to justify budgetary allocations. However, although it has many commendable features, there have been practical problems in implementing the program-based budget model, such as in the allocation of responsibility for cross-institutional programs, difficulties with aligning numerous institutional activities within the programs, and the complexity of adequately applying the methodology throughout public administration (which includes defining and monitoring indicators).

The zero-based budget seeks to analyze and justify budgetary programs and allocations from the outset, which makes it the opposite of incrementalism. Given that it entails a budgetary process that is almost independent each financial year, as in the case of program-based budgets, the main difficulties of zero-based budgets are associated with implementation. The length of the budgetary process within a zero-based budget model is excessive, and the lack of historical analysis hampers efficiency.

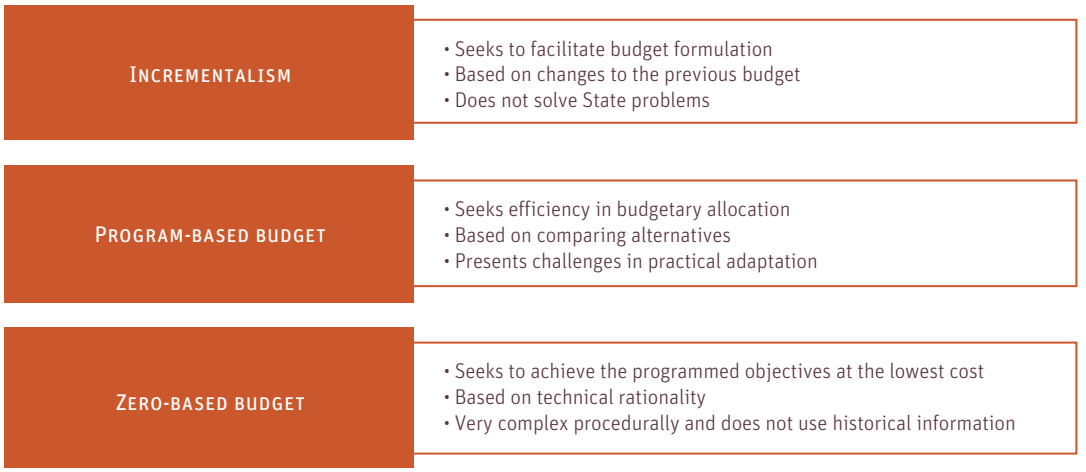
That said, although these models have shortcomings, they are a starting point from incrementalist practices toward effectiveness and efficiency in public expenditures. The pragmatic application of a program-based budget, which resolves some of the typical problems associated with its implementation, is an important element when structuring a successful performance-based budget. Figure 2.3 sets out the main characteristics of these three models.

PERFORMANCE-BASED BUDGET

The evolution of budgetary models has led to an alternative that is less difficult to apply and is also aligned with the objectives of efficiency, effectiveness, and transparency: the PBB. The PBB model relies on instruments, methodologies, and processes that systematically monitor performance regarding the use of public resources (past and anticipated), as well as conditions, demands, and incentives to motivate and facilitate precisely the good performance of public institutions.

Although linking the budget more closely to performance is an almost universal aspiration for governments, it is hard to find a conceptual framework that defines and structures the budget's various

FIGURE 2.3: EARLY BUDGETARY MODELS

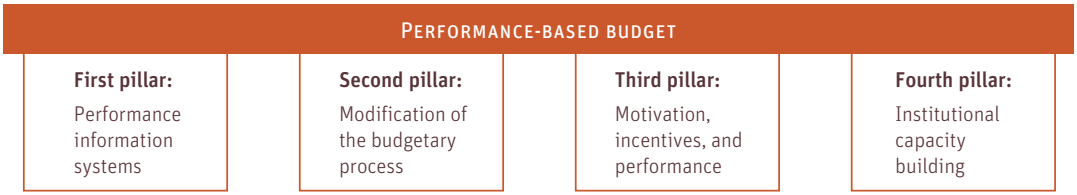


elements and helps draft an implementation strategy. Although each country's particular reality will eventually determine the course to follow, it is important to establish a framework that serves as an analytical departure point. This chapter presents a modular design for PBB implementation that is based on four fundamental pillars to ensure satisfactory implementation and operation.

The first pillar ensures the implementation of information systems to measure the performance of public agencies. The second pillar entails the modification of the budgetary system such that performance data is used in resource allocation. The third pillar involves providing motivational and incentive mechanisms to ensure efficient budget performance. Finally, the fourth pillar supports institutional capacity building in government agencies so they can meet their objectives, including making adjustments to management systems in order to encourage results-based management (Figure 2.4).

It is worth reiterating that the PBB is not a system whereby budgetary allocations are mechanically decided based on diverse government agency outcomes. Public management is too complicated for the budget to be based solely on performance. Moreover, it is not obvious that a poorly performing institution should receive less of the budget, given that the institution's beneficiaries (e.g., the citizens) might end up bearing the brunt of budget cuts. The PBB seeks to provide incentive mechanisms to achieve performance goals, rather than doing so by merely cancelling poorly executed programs.

FIGURE 2.4: THE FOUR PILLARS OF THE PERFORMANCE-BASED BUDGET



First Pillar: Performance Information Systems

The first pillar of the PBB supports the creation and implementation of performance information systems, which are useful for decision making at all stages of the budgetary cycle. Performance information is not just based on the final products and services delivered by the public sector, but rather on all stages of the productive process, which allows for the identification of critical points for intervention. For example, even if a program has the desired impact, it might still be enhanced if flaws are encountered in the efficiency of its production process.

Gathering performance information is not enough to develop the first PBB pillar; the information in question must also fulfill certain criteria. First, it must be gathered at the opportune moment (e.g., it would be of little use to have detailed information about each program after the following year's budget has already been drafted). Second, the information must be accurate and legitimate. Technical reports should be preferred over those of a political nature, as the latter might lack credibility or, if used, lead to erroneous conclusions. Third, information gathering must be efficient, and not become a costly exercise. Finally, the information must be useful for decision making.

Before a system to gather performance information is created, it is important to establish what exactly is being measured. In line with the objectives of the budgetary process (Figure 2.1), this should include the efficiency, economy, and effectiveness of institutional performance. Given the breadth of these concepts, however, difficulties arise when it comes to measuring them. Performance information systems therefore consist of complementary instruments that capture a wide range of factors. The two principal data-gathering instruments are monitoring and evaluation.

Monitoring systems

Monitoring systems are based on periodically gathered internal indicators. These indicators, although simple, allow for measuring important aspects of government agency performance. Table 2.1 presents an example of a monitoring system for a milk distribution program, benefitting the population under the age of six, through a public health center.

TABLE 2.1: EXAMPLE OF A MONITORING SYSTEM

INDICATOR	FORMULA/UNIT OF MEASUREMENT	STAGE	OBJECTIVE
Fulfillment of the milk procurement program	(procurement processes carried out/planned procurement programs)*100 Unit of measurement = %	Process	Effectiveness
Fulfillment of the program to deliver milk rations to the health centers	(milk rations delivered to the health centers/planned milk ration deliveries)*100 Unit of measurement = %	Process	Effectiveness
Coverage of the milk program among children under the age of six	(children under six covered by the milk program/total of the children under six attended to in CPS)*100 Unit of measurement = %	Product	Effectiveness
Malnutrition rates among children under the age of six covered by the program	(children under six with some degree of malnutrition/total of children under six covered by the milk program in the health centers)*1.000 Unit of measurement = cases per 1,000	Final result	Effectiveness
Average cost in human resources for each milk procurement process	Sum (type *x* working hours dedicated to milk procurement processes * cost of a type *x* hour)/N° of procurement processes Unit of measurement = USD per procurement process (tender)	Process	Efficiency
Average cost of a kilo of milk	Total cost of milk procurement/N° of kilograms purchased Unit of measurement = USD per kilo	Product	Efficiency
Donor participation in total financing of the milk program	(total donations/total cost of milk procurement)*100 Unit of measurement = %	Process	Economy
Losses due to spoiling	(kilos of milk lost through deterioration/total kilos of milk purchased)*100 Unit of measurement = %	Product	Economy

Note: CPS = Child Protective Services.

Monitoring systems generally have certain limitations. First, the way that some of these indicators are measured implies a certain degree of relativity. For example, how can one tell if an 80 percent milk procurement rate is good or bad? The answer demonstrates the need for periodic monitoring, which in turn enables the evolution of a program's effectiveness, efficiency, and economy to be ascertained. In the previous example, an achievement of 80 percent might be deemed unsatisfactory if it turns out to be the lowest rate recorded over a set period. On the other hand, a 110 percent milk procurement rate probably reflects a very low estimate of the planned purchases. The latter example allows us to appreciate the usefulness of indicators in adjusting objectives and, very generally, the importance of improving and reviewing indicator systems over time.

Second, monitoring systems do not establish a causal relationship between a program's execution and its outcomes. Additional analysis is required to specifically identify the factors that lead to the results

obtained. Furthermore, exogenous factors must be taken into account (e.g., a natural disaster that affects the organization's activities).

Finally, inadequate implementation of the monitoring system can generate negative effects on staff behavior. In particular, when the indicators do not measure all relevant areas, it might lead to conduct that is biased in favor of merely satisfying the existing indicators. For example, if the sole performance indicator is the number of hours worked, then the staff might ensure they spend more time at the office, but not necessarily to do more work.

Evaluation systems

Evaluation systems represent a natural complement to monitoring. Evaluation implies a detailed analysis of a specific program or institution, usually carried out by an external body or an independent and specialized government agency.

It is worth highlighting two main differences between monitoring and evaluation. First, evaluation establishes a causal relationship between an agency or program's specific elements and its results. Second, evaluation takes longer and is more costly, which means that it is often less frequent. Evaluation also needs to meet certain criteria to produce useful results. On top of the characteristics recommended for monitoring systems (timeliness, relevance, and efficiency), the independence of an evaluating agency is also key to its credibility.

Other factors that should be defined prior to an evaluation are: (i) the methodology; (ii) the scope (e.g., program or institution); and (iii) the degree of detail (e.g., depending on each case, less detailed but more frequent evaluations can be conducted, although this must be established beforehand). Ideally, methodology should be defined first in order to set standards of quality and to support comparisons between the different evaluation reports. However, a balance must be struck between this objective and the need to preserve some flexibility so that evaluations can adapt to each individual case, varying the scope and the degree of detail as necessary.

In general, similar to the case of monitoring systems, results from evaluation systems should lead to corrective actions. These actions must not be limited to budgetary decisions but should also include managerial improvements and adjustments in strategic planning.

Second Pillar: Modification of the Budgetary Process

The second pillar of PBB implementation involves the modification of the budgetary process so it can effectively incorporate the information generated by the monitoring and evaluation systems. The entire budgetary process, from planning to post-execution evaluation, must be set up to promote efficiency and effectiveness in the use of fiscal resources.

Box 2.1: Evaluation Methodology in Brazil

In Brazil, the Court of Auditors (Tribunal de Cuentas de la Unión) is one of the institutions responsible for carrying out performance evaluations. In 2010, this institution published the third edition of the Performance Auditing Manual (*Manual de Auditoría Operacional*), which aims to "define the principles and regulations that guide the application and quality control of audits."

The Manual explains that operational auditing is considered to be an independent examination whose objective is to measure the economy, efficiency, efficacy, and effectiveness of government agencies, programs, and activities.* Each of these objectives is explained in detail.

With regard to how the audit subject matter is selected, the Manual specifies that the principal aspect determining the decision to audit must be the audit's capacity to improve public management. Other factors include tangible benefits, relevance, and the vulnerability of the subject matter analyzed. Each of these factors is described in detail, including the possibility of using surveys to define them.

The Manual also includes details and specific methodologies for preliminary planning of the study, its execution, drafting the final report, monitoring application of the recommendations laid out therein, and quality control of the audits themselves.

* The expression "operational auditing" is used as a synonym of "performance auditing."

Source: Court of Auditors (Tribunal de Contas da União, 2010: 11).

At each stage, the use of information for pragmatic decision making should be paramount, and there must be clear objectives to guide program design and execution, and the activities of government agencies. Although performance data is a key element in budgetary decision making in the PBB model, other important factors are also considered (e.g., strategic objectives and the needs of the population). In other words, performance information is a tool to support decision making, but it is not the only tool. Table 2.2 provides examples of different levels of performance information used in budgetary decision making. The specific form in which the information is used varies according to the stage of the budget cycle.

To ensure that the information is used appropriately, the different budgetary stages must be adapted according to specific factors. Figure 2.5 presents a summary of the key factors to consider when each

TABLE 2.2: DEGREE OF USE OF INFORMATION

BUDGET AND PERFORMANCE REPORTS	BUDGET WITH PERFORMANCE DATA	PERFORMANCE-BASED BUDGET	BUDGET DETERMINED BY PERFORMANCE
Performance information is submitted with the budgetary documents but is not used for decision making.	Performance information is used for budgetary decision making but only as a secondary factor.	Performance information plays a key role in allocating budgetary resources but other factors are also considered. Budget allocations are not necessarily determined according to performance.	Budgetary allocations are directly and explicitly linked to performance.

Source: Shah and Shen (2007).

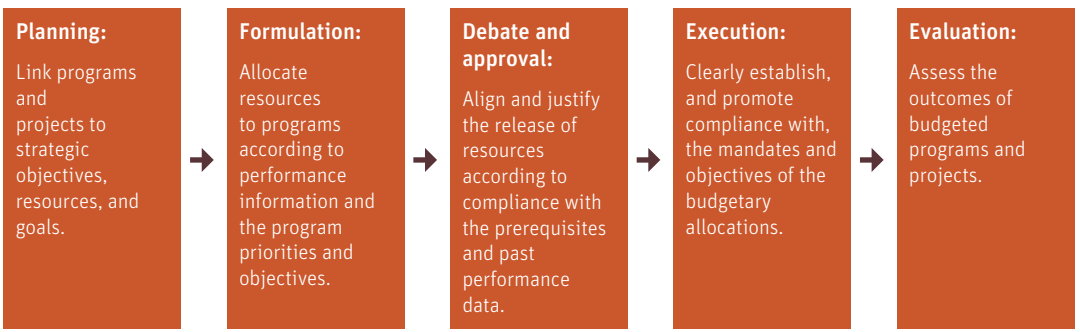
stage is modified, although each factor in turn must be adjusted according to the individual characteristics of each country.

Planning

In the planning stage, goals and plans are established for the upcoming budget cycle, which ideally are the product of a results-based strategic planning process. This implies ensuring that decisions about what to include in the budget do not reflect political interests or favor speculative proposals in which fiscal resources are used without a tangible benefit for citizens.

Strategic planning can be a useful tool for modifying this particular budgetary stage. Strategic planning includes: (i) having medium- and long-term national plans that clearly establish the planning horizon and program activities, and (ii) ensuring that the national plan is viable, which is why it should be linked to a medium- and long-term fiscal framework. Such planning helps to avoid using resources for

FIGURE 2.5: MODIFICATION OF THE BUDGETARY PROCESS



programs that will not yield results because they require complementary actions in the future that are not fiscally viable.

Formulation

During formulation, the draft budget for the coming fiscal period is defined and then submitted for debate and approval. Basically, the role played by the legislature in each country's budget debate determines whether discussions about budget projects are extensive and substantial, or relatively limited and

Box 2.2: Strategic Planning in Colombia

In 1961, President Alberto Lleras Camargo presented Colombia's first four-year development plan (Plan Cuatrienal de Desarrollo), affirming in his speech that "no country without clear, rational purposes, based on a scientific appreciation of its possibilities and its capacity for development, can aspire to progress with its own resources and, less still, with outside help."

Fifty years later, the planning process has been completely consolidated in Colombia. The Constitution of 1991 requires the incoming government to present a National Development Plan to congress during the first six months of its term of office. The plan must comprise a general plan and an investment plan that holds the status of "special law." As an important part of the process, the constitution created the National Planning Council (Consejo Nacional de Planeación), which is made up of representatives of territorial entities and of different economic, social, environmental, community, and cultural sectors. The council is consultative and acts as a forum for debate about the National Development Plan. The government presents the plan to congress once it has been debated in the council and its recommendations have been accepted.

In recent years, planning in Colombia has been enriched by the incorporation of new instruments, including Plan Colombia 2019 and the Medium Term Fiscal Framework (MTFF). Plan Colombia 2019 is the result of efforts made by the planning authorities to articulate a national vision to coincide with the celebration on the bicentenary of the Republic's foundation and has been an articulating agent for diverse development initiatives. The MTFF, regulated by the fiscal responsibility law, provides the principal fiscal and economic variables in which public policies are framed.

Source: Authors' elaboration based on data obtained from www.dnp.gov.co.

Box 2.3: Ex-Ante Evaluations in Bolivia

During the budgetary formulation process in Bolivia, the results of ex-ante evaluations of the proposed projects are examined before determining which projects will receive financing. Furthermore, ex-ante evaluations in Bolivia must fulfill certain quality requirements. For example, there is a group of six specific objectives that the evaluations must achieve, a legal framework for their financing and design, and defined methodologies for preparing and evaluating projects in specific sectors.

Sources: García López and García Moreno (2011); Aldunate (2009).

of little consequence. Ideally, the legislature should play a central role as a counterpart in the budgetary process. There are various initiatives in the region aimed at strengthening the technical capacity of legislative branches to analyze budget proposals from the executive branch.

Performance information should be used at this stage of the PBB process, not only to ratify or eliminate budgetary allocations, but also to propose improvements in (or alternatives to) inadequate services for citizens. Key interventions can thereby be identified and incorporated to achieve the desired goals. Otherwise, an ineffective program might be eliminated, even though it needed only a slight increase in budget to solve problems in some of its stages, or an inadequate program might be ratified or have its budgets increased. Ex-ante reports are fundamental for reviewing new proposals at this stage.

Debate and approval

During the debate and approval stage, which ends when the legislature approves the budget for the following financial year, two fundamental factors must be taken into account. First, the review and analysis of the performance information initiated in the previous stage must continue. Second, the budgetary allocations must be linked to mechanisms that encourage the achievement of targets. There are various ways to implement motivational mechanisms that align bureaucratic objectives with those set out in the budget (see the section below on the third pillar: motivation, incentives, and performance).

Execution

During the execution stage, which occurs throughout the financial year, the principal modifications are those that affect the way that government agencies operate. First, the managers of such agencies

must be made fully aware of the objectives to be reached through their activities and how they, precisely, justify the budget allocation. Second, the incentives and motivational mechanisms must be put into place to stimulate the agencies' internal operation. Finally, government agencies must have the necessary tools to carry out what is demanded of them (fourth pillar: institutional capacity building).

A key element of budget execution is an integrated financial management information system (IFMIS), which monitors and generates information that is useful for decision making. Chapter 3 of this publication examines the importance of these systems for fiscal policy efficiency and effectiveness. In general, the LAC region has made great progress in such systems, and the quality of financial information is now rather good. However, the challenge remains to link the IFMIS with the results monitoring systems to generate relevant indicators to monitor public spending.

Evaluation

Finally, in the post-execution evaluation stage, modification requires the use of the greatest number of evaluation instruments possible. Impact evaluation costs can restrict their use to specific cases, but agile and economical mechanisms should be applied in the most general way possible (e.g., desktop evaluations or intermittent analysis). Evaluations must be credible and independent, provide feedback for public policy and budgetary design, and inform citizens.

Third Pillar: Motivation, Incentives, and Performance

The final two pillars of PBB implementation are related to establishing tools to ensure that the modification of the budgetary process translates into greater efficiency, effectiveness, and economy in public expenditures. In particular, the third pillar relates to the institutionalization of incentive and motivational mechanisms to ensure efficient budget performance is on par with the desired results.

The public sector is very commonly associated with inefficiency. This occurs because it lacks adequate incentives to achieve efficient results, especially in comparison with the private sector. In the private sector, the market naturally demands efficiency to create economic profits. In contrast, the State often acts as a monopoly in its activities. Furthermore, its incentive systems have often been designed to reward staff members for the number of years served, without considering their performance or the degree of customer satisfaction. If government agencies are expected to obtain optimal results, then its personnel must be motivated to achieve them.

Table 2.3 presents some of the motivational mechanisms that can be introduced into the public sector. This list is merely a reference point, given that each country must seek the mechanisms that best match its individual characteristics.

TABLE 2.3: PUBLIC SECTOR MOTIVATIONAL MECHANISMS

	FINANCIAL	NONFINANCIAL
Individual	Shares Promotion	Recognition of achievements
Collective	Shares Institutional projects	Recognition of achievements Transfer of responsibilities

Financial incentives

Financial incentives are based on providing economic rewards for good performance by civil servants. One of the most interesting and most frequently used incentives in developed countries is career promotion. This mechanism seeks to replace the previously abandoned systems in the public sector, which were based on length of service rather than performance. There are different systems of performance-based promotions, and it is important to implement the one that best adapts to each organization, bearing in mind that there can be a variety of systems in different institutions within the same country.

Another financial incentive tool involves offering shares in return for good performance and the achievement of specific goals, which is very common in the private sector. The shares might be awarded at the institutional, the team, or the individual level. In any case, it is important to establish the appropriate objectives to achieve the desired behavior. Furthermore, the value of shares should not exceed the benefit that results from achieving the set goals.

Finally, institutional projects can be financed as a reward for performance by an organization or an area within an organization. In this case, the reward must be designed very carefully. First, the cost of the project must not surpass the benefits gained from achieving the established goals. Second, it is important to ensure that the project will indeed motivate all involved.

Nonfinancial incentives

Nonfinancial incentives include recognizing achievements and transferring responsibilities. The recognition can be based on an individual or institutional achievement. It must be completely transparent and based on categories that foster the achievement of institutional goals. In individual recognition, healthy competition, rather than rivalry, should be stimulated. For institutional recognition, the staff members should be encouraged to identify with, and feel proud of, their organization's achievements.

Transferring responsibilities consists of decentralizing responsibilities toward the subnational institutions. The effectiveness of this incentive depends on the clarity of the division of functions. The motivation to achieve goals within an institution derives, precisely, from clearly establishing, to the staff and the

citizenry, what these goals are. To achieve results, the organization must also have its own incentive structure, as well as the required capacities.

Finally, it is worth mentioning that, whichever incentive is chosen, its operation must be transparent, reliable, and fair. Otherwise, it can give rise to internal or inter-institutional conflicts that can make achievement of the proposed goals even more difficult.

Fourth Pillar: Institutional Capacity Building

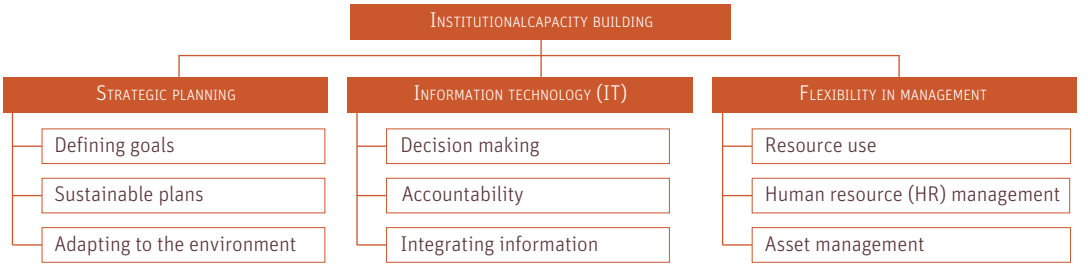
Institutional capacity building involves diverse tools, most of which are adaptations of those already applied in the private sector, such as strategic planning, information technology, and flexibility in management (Figure 2.6).

Strategic planning

The importance of strategic planning lies in the frequent divergence between a government agency's mandatory goals and its decisions and actions, which often results in inefficiency and ineffectiveness. Strategic planning in a government agency involves defining what the agency's objectives are and how they are to be achieved. To do so, it is necessary to establish clear links between the agency's day-to-day activities and the final objective or goal it is pursuing. Thereby, effective strategic planning results in the elimination of activities that do not contribute to achieving goals. Moreover, by revealing the future impact of present decisions, it helps to achieve administrative sustainability and to respond adequately to changes in the environment.

Many instruments facilitate strategic planning within agencies and at the government level. For example, exercises of a "logical framework" are useful for aligning objectives with concrete activities and their related costs. Many countries around the world use strategic planning intensively. For example, Singapore has multiannual strategic plans (some of them with a more than 30-year horizon) in diverse sectors such as transport, culture, and the environment.

FIGURE 2.6: INSTITUTIONAL CAPACITY BUILDING AREAS



Information technology

Information technology systems can improve performance monitoring, provide timely accountability to citizens, and enhance the level and quality of information available for decision making. One important technological tool for managerial decision making is the IFMIS (see Chapter 3). This system consists of information technology programs developed to standardize the form in which government agencies register and present their financial and accounting statements. Their main advantage resides in the transparent application of internal monitoring of the budgetary process and the availability of financial information for decision making. Other technological tools can be used to monitor performance indicators, analyzing and prioritizing investment projects and providing information to the public (e.g., through so-called transparency portals).

The range of possibilities offered by information technology systems includes an innumerable series of factors that can improve the capacity and quality of government operation. Each country and agency must incorporate the ones that are best adapted to its specific needs.

Flexibility in management

Management style, especially the high degree of administrative rigidity in excessively bureaucratic systems, is closely linked to specific shortcomings in the public sector. Although these systems are initially established to exercise greater oversight of the use of fiscal resources, the PBB model requires some flexibility in management so that oversight does not sabotage results-based management.

Rigidity in management is frequently observed in procurement and managing tenders. In spite of the great advances seen in the LAC region—including legal reforms and the application of e-procurement instruments—the emphasis still lies on the monitoring of inputs, rather than of the results achieved with their use. The solution is not easy, because procurement and tenders are often a source of corruption in public administration. Therefore, making rules more flexible to encourage results-based management can be a difficult decision, especially when the external monitoring systems are not equipped to undertake performance auditing.

Excessive rigidity is also observed in human resource (HR) management. Although there is no clear consensus about the extent of benefits and employment protection that should be provided for workers in general, it is unjustifiable that the laws on hiring and firing are significantly more complicated for the public sector than for the private sector. In order to implement a PBB model, HR managers in government agencies must have tools at their disposal that are on par with those available to their private-sector counterparts. In other words, employment laws that specifically pertain to the public sector, many of which are the result of outdated paradigms in the sector, must be reexamined and modified to create more efficient and effective institutions.

Finally, outdated laws in the public sector often hinder managers from taking advantage of their organization's resources. For example, there might be impediments to renting or selling or other activities

Box 2.4: Public Procurement in Peru

Peru has improved transparency and created more flexibility in management by implementing a public e-procurement system. Public procurement can be conducted through classic procedures or through reverse auction. The classic procedures are public bidding, public calls for tender, direct awarding, selective awarding, and small-scale awarding. Reverse auctions can be carried out physically or electronically. Each method of procurement has its own legal formats and frameworks.

In terms of flexibility, public institutions can make small-scale awards in a shorter procurement process, within an average of eight days through Peru's virtual public procurement platform Peru SE@CE (www.seace.gob.pe).

Other processes of higher economic value manage to combine transparency with flexibility. Public procurement and tendering on average takes 30 to 33 days, whereas all other processes take an average of between 10 and 17 days.

Source: Authors' elaboration.

that involve fixed assets. Therefore, potentially useful and productive assets can become a burden for public agencies due to their high maintenance costs.

In conclusion, in order for public agencies to demand the same levels of efficiency and effectiveness as the private sector, similar mechanisms must be put into practice. Although there are fundamental differences between public and private administration, performance in the public sector should not be restricted by impractical parameters.

TOWARD IMPLEMENTATION OF PBBS IN LATIN AMERICA AND THE CARIBBEAN

Where Are We Now?

Countries in the LAC region must overcome particular challenges, different from those faced in developed countries, as they work toward implementing an effective PBB model. Although the region is heterogeneous, the challenges are common among the countries. Figure 2.7 divides the challenges into three key categories: the high degree of budgetary volatility, the large gap between the population's needs and the services provided by the State, and the dysfunctional budgetary structure.

FIGURE 2.7: BUDGETARY CHALLENGES IN LATIN AMERICA AND THE CARIBBEAN

Budgetary volatility

Fiscal volatility has a destabilizing effect on public policies and discourages implementation of the PBB model in the LAC region. Volatility manifests itself through frequent and significant variations in fiscal revenue levels or through unforeseen vulnerabilities that can generate extraordinary costs (e.g., natural disasters). Uncertainty regarding the availability of funds in the future hampers medium- and long-term planning. This uncertainty is even greater when fiscal revenues are related to international prices for natural resources, as is often the case in the region. Although it is impossible to completely eradicate volatility, it can be reduced to manageable levels. As explained in Chapter 1, fiscal rules based on structural balanced budgets can significantly reduce fiscal volatility. In the absence of such rules, expenditure volatility can follow the revenue volatility. When social expenditures are affected, the most needy groups of the population are the most exposed to the effects of fiscal volatility, which results in greater demands for future aid.

Gap between needs and services provided

Reducing the high levels of poverty and social neglect are significant obligations for the State and hamper the establishment of countercyclical rules because, when fiscal revenues increase, attending to social needs make it harder to save. This means that when revenues are decreasing, resources are depleted, which begins a vicious cycle. On top of the social needs gap, the State must also cover other gaps, including, for example, in infrastructure development.

Budgetary structure

Another challenge that the LAC region must face is the political economy of the budgetary process. It is common for political, regional, or sector interests to "capture" portions of public expenditures through permanent regulations. This is the case with expenditure floors, which are legal (or constitutional) regulations that

Box 2.5: Expenditure Floors in Ecuador

In Ecuador, in 2001, there were 32 preallocations for tax revenue and 25 for oil revenue, which represented 3 percent of GDP. In 2004, the preallocations represented 4 percent of GDP (2.4 percent tax revenue and 1.6 percent oil revenue). Historically, preallocations have been a characteristic of Ecuador's tax system that suffocates the efficiency and flexibility of budgetary management.

Source: López-Cálix and Melo (2006: 20–22).

ensure a certain percentage of public funds are earmarked for a specific purpose. Although in some cases these rules are created to protect state policies from budgetary volatility, in general they obstruct planning and resource allocation according to the processes of the PBB model.

Disorder, lack of planning, and low institutional capacity have led to another structural problem in the LAC region: continuous budgeting, or making budgetary decisions throughout the fiscal year. In this situation, budget decisions are made based on immediate events and by using special powers such as emergency expenditure decrees. Although flexibility is required for emergency situations, legislation must be thorough enough to avoid excess that can compromise the legitimacy of the budget.

The final budgetary challenge discussed in this chapter is the distribution of political power. The power of the executive branch over the legislative branch in budgetary matters is considerably greater in LAC countries than in developed countries. The legislature must be an effective counterpart to ensure that public spending reflects social aspirations and to demand adequate accountability from the executive branch.

In spite of these difficulties, some LAC countries have managed to make significant progress toward developing PBBs. Table 2.4 classifies 16 countries in the region according to their level of PBB implementation. Brazil and Chile are the only countries that have reached a high level of implementation, while Colombia, Costa Rica, and Mexico are following in their footsteps and display a medium level. Finally, many countries are still at the initial implementation level.

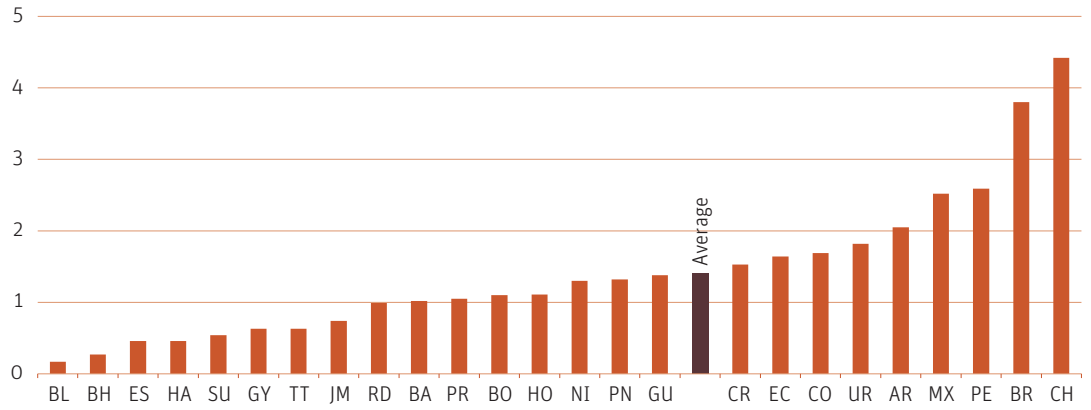
In general, lack of progress in the LAC region is most likely to be found in the first PBB pillar: gathering performance data (García López and García Moreno, 2011). This, in turn, leads to an infrequent use of performance information in decision making during the budgetary process. Finally, progress in the implementation of motivation and incentive systems and institutional capacity building tools varies significantly among countries in the region. Some countries have made notable progress, while others are far

TABLE 2.4: LEVEL OF PBB IMPLEMENTATION IN THE LAC REGION

CATEGORY	COUNTRIES
First group: high implementation level	Brazil, Chile
Second group: low implementation level	Colombia, Costa Rica, Mexico
Third group: initial implementation level	Argentina, Bolivia, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Paraguay, Peru, Uruguay

Source: García López and García Moreno (2011).

FIGURE 2.8: THE PBB INDEX, ACCORDING TO THE PES



Source: García López and García Moreno (2011).
Note: BL = Belize; BH = Bahamas; ES = El Salvador; HA = Haiti; SU = Suriname; GY = Guyana; TT = Trinidad and Tobago; JM = Jamaica; DR = Dominican Republic; BA = Barbados; PR = Paraguay; BO = Bolivia; HO = Honduras; NI = Nicaragua; PN = Panama; GU = Guatemala; CR = Costa Rica; EC = Ecuador; CO = Colombia; UR = Uruguay; AR = Argentina; MX = Mexico; PE = Peru; BR = Brazil; CH = Chile.

behind. Figure 2.8 illustrates the PBB index elaborated by the Inter-American Development Bank (IDB) based on its Program to Implement the External Pillar of the Medium-Term Action Plan for Development Effectiveness (PRODEV) Evaluation System (PES).[1]

[1] The PES is a tool that aims to analyze the degree of progress and institutionalization of the practices and instruments used in management for development results (MfDR) in the public sector. This tool measures five elements of MfDR: (i) results-based planning; (ii) results-based budgeting; (iii) financial management, auditing, and procurement; (iv) program and project management; and (v) monitoring and evaluation.

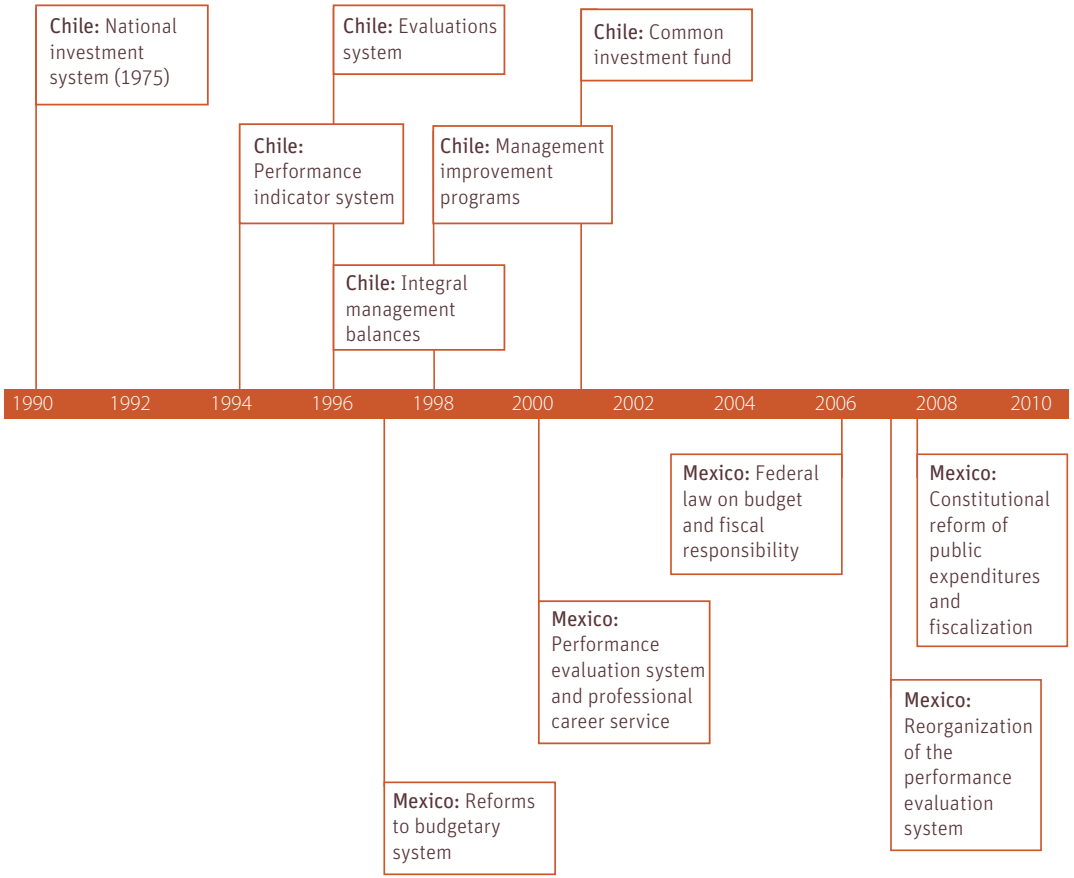
Different Roads to PBB Implementation

Implementation of the PBB model does not lead to a radical transformation of budgetary regulations that immediately results in greater efficiency, effectiveness, and economy, but rather corresponds to gradual changes that enable the modification of both the budgetary process and the thought process of budget executives. These changes include creating tools and conditions that support informed decision making. Results materialize slowly, as the annual budget process is repeated and improved, and as the people involved commit themselves to the model.

Along with not being instantaneous, PBB implementation does not follow a specific path and there is no instruction manual. Each country must identify its specific implementation challenges and develop the most appropriate PBB pillars accordingly. Figure 2.9 shows the chronological progress of PBB implementation in Chile and Mexico. Two important differences in their paths are worth highlighting. First, whereas Chile started by developing information systems, Mexico began by making reforms in planning and target setting. In particular, reforms in Chile were initiated by putting into practice ex-ante analysis systems (different from performance data) in order to establish the practice of informed decision making. In Mexico, in 1997, the reform of the budgetary system emphasized strategic planning for the future and established guidelines for gathering information and managing objectives. Second, whereas in Chile the reforms occurred at intervals of at least two years, in Mexico they happened much faster.

In spite of these differences, reforms in Chile and Mexico have one outstanding feature in common: in both instances the countries developed the performance information systems pillar. Although the steps taken were not identical, generating performance data was among the first two or three reforms in both countries. This was a logical decision, because it would be impossible to work on a performance basis without first obtaining the indicators of results.

FIGURE 2.9: PBB IMPLEMENTATION PROGRESS IN CHILE AND MEXICO



Source: Authors' elaboration.

CONCLUSIONS

It is well known that there is no single model or standardized process to strengthen institutions. The process of transforming a public budget that is guided purely by controlling inputs into one guided by performance is no exception. However, there is a commonly used analytical framework that breaks the PBB model down into separate but interdependent elements, serving as a starting point for analysis and a roadmap for implementation.

In this chapter, the PBB model has been broken down into four interrelated pillars. The first pillar relates to performance information systems and the importance of having reliable and timely indicators to monitor public programs, as well as ex-post evaluations to further calibrate and reflect the scope of policies in the budgets. The second pillar refers to adjustments in budgetary decision making so that performance information can be incorporated in an intelligent rather than a mechanical way, thereby improving resource allocation. The third pillar is about creating motivational and incentive mechanisms (institutional and individual; financial and nonfinancial) for better budget performance. Finally, the fourth pillar supports institutional capacity building, which includes modifying administrative processes to orient them toward a performance-based culture and developing technological instruments to support the operational processes.

To make progress in PBB implementation in the LAC region, it is important to consider the main obstacles that the countries face. On the one hand, fiscal resource or public expenditure volatility complicates the implementation of budgets that are articulated according to planning and whose execution is geared to achieving results. Furthermore, the existence of unsatisfied social demands hinders implementation of a countercyclical expenditure regime, given the great political pressures that weigh on the government in office. Finally, there are important challenges associated with the political economy of the budgetary process, among them problems of rent-seeking by sector or regional interests, continuous budgeting, and disequilibria in the relative State's capacities. In spite of these challenges, some countries have significantly advanced in PBB implementation, opening the way for better budgetary institutions and better public services in the region as a whole.

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CHAPTER 3

Integrated Financial Management Information Systems Oriented Toward a Modern Public Management

Pedro Farias and Carlos Pimenta

- Integrated financial management information systems (IFMIS) are computerized systems that automate the financial procedures needed to register the collection of public revenues and public expenditures to achieve public sector goals.
- In Latin America and the Caribbean, IFMIS have contributed significantly to economic stability and fiscal responsibility in recent decades, and they have evolved by keeping pace with the conceptual and technological advances that have affected work processes in the public sector during this period.
- The future challenge is to advance toward systems that are even more firmly committed to supporting management and decision making.

In the Latin American and Caribbean (LAC) region, integrated financial management information systems (IFMIS) have been in place since the 1980s, primarily as a way of improving the monitoring of public expenditures and improving record keeping in response to fiscal and macroeconomic crises. IFMIS continue to predominate in the region, but they have evolved with regard to their role and contribution to the processes of modernizing public financial management and improving the quality of public expenditures.

This chapter aims to systematically present the accumulated knowledge about IFMIS in the LAC region based on conceptual, functional, technological, and strategic analyses. Initially, the authors approach some conceptual aspects of IFMIS, along with their historical evolution in the region and their principal components and functions. Then, the authors examine the level of integration of IFMIS with other administrative systems and identify some strategic requirements for the formulation, establishment, and operation of IFMIS in the region. Thereafter, the authors outline the main technological characteristics of IFMIS and analyze their current state, which includes possible indicators for quality control and for public financial management in general. The final section synthesizes the strategic aspects of IFMIS, as well as the main tendencies in their design, implementation, and operation.

CONCEPTUAL ASPECTS OF IFMIS

Government financial management requires public agencies to adopt standardized practices to keep records of revenues and expenditures and to manage the flow of financial resources. Along with an adequate institutional and regulatory framework, standardizing these procedures usually demands technological tools that support the execution of diverse administrative functions related to governmental financial resource management. Some of these functions are based on repetitive working processes and require the processing of a great number of transactions—which may be geographically dispersed—in a short period of time (Hashim and Allan, 1999).

This is the context in which IFMIS arose and, although they are mainly located in the LAC region, they can also be found in countries throughout the world. According to Peterson (2006: 9), "an IFMIS is a computer application that integrates key financial functions (e.g., accounts, budgets, etc.) and promotes efficiency and security of data management and comprehensive financial reporting." In other words, IFMIS are computerized systems that automate the financial procedures necessary to record public revenue collection and expenditure, and to apply these procedures to achieve public sector goals. In this way, IFMIS facilitate the execution of payments by the treasury, as well as bookkeeping activities and financial record storage. Moreover, they enable the generation of reports and endow public resource management with greater efficiency, information security, and transparency.

The predominant IFMIS model currently in the LAC region comprises four main areas: budget, treasury, accounting, and public debt. Moreover, the IFMIS interact with other public resource management systems, such as public investments, human resources, payroll, procurement, tax administration, project management, and public goods administration.

Most IFMIS in the region are based on a more or less main standard model, and then tailored to fit each country's reality. This is due, in part, to the fact that IFMIS in different countries were constructed under similar political, economic, and institutional conditions, although in some cases they were complemented by recommendations of enterprises or consultants taking part in the design process. Consequently, the common model found in LAC countries is essentially the same, although the conceptual design differs between countries due to regulatory specifics.

This model is characterized by the use of a wide-reaching, single system, with a centralized administration under the treasury and budget authorities and, in general, with a central database that, although integrated, operates in a decentralized way throughout the public agencies. It is worth mentioning that in many developed countries public financial systems are much less standardized than in the LAC region, and it is not common to adopt a standard system for the entire government.

In general, this conceptual model is associated with a Treasury Single Account (TSA) mechanism and with the development and operation of a single and standard computerized financial management

application for the entire central or subnational government, which constitutes one of the main pillars of public expenditure efficiency, effectiveness, and transparency. Although this model contributes to consolidating macroeconomic stability and fiscal responsibility in the majority of countries that have implemented it, there is also a growing consensus that IFMIS are a very important tool for supporting continuous improvement in public management decision making.

IFMIS IN THE LAC REGION

Initially developed only to fulfill some of the basic functions of public finance, IFMIS have evolved in line with the conceptual and technological progress that has shaped public sector work processes in recent decades. IFMIS have thereby increased their operational reach, their importance within public administration, and their integrative capacities. The regional pioneers in terms of the design of IFMIS were Brazil (1986) and Bolivia (1989). These countries drafted single, standardized conceptual designs for each level of government, with centralized databases and decentralized operation. Over time, these models have improved and have been applied to other countries in the region. Today, nearly all LAC countries have some form of IFMIS with these characteristics.

The first IFMIS in the region focused on monitoring and managing cash payments made by the treasury during public budget execution, and enabled accounting records of all financial transactions to be kept and reported. In other words, they were initially designed to fulfill the information needs of the central ruling bodies responsible for expenditures (budget, treasury, and accounting), with a top-down management approach that did not consider the needs of other agencies that required information from the IFMIS to improve their own resource management. Gradually, the objectives were widened until IFMIS supported the automation and standardization of all financial procedures, with an approach to increase efficiency and provide transparency, predictability, and information security to budgetary and financial management.

One important aspect of the predominant IFMIS model in the LAC region is that budgetary execution accounting is automatically inferred from the budget headings through conversion tables. In other words, it is based on algorithms that associate the budgetary registers with accounting registries, thereby automatically generating double-entry bookkeeping. This model has been established in Argentina, Bolivia, Colombia, the Dominican Republic, Guatemala, Honduras, and Nicaragua. In other countries, such as Brazil and Peru, the automatic accounting inference is achieved using a table of events.

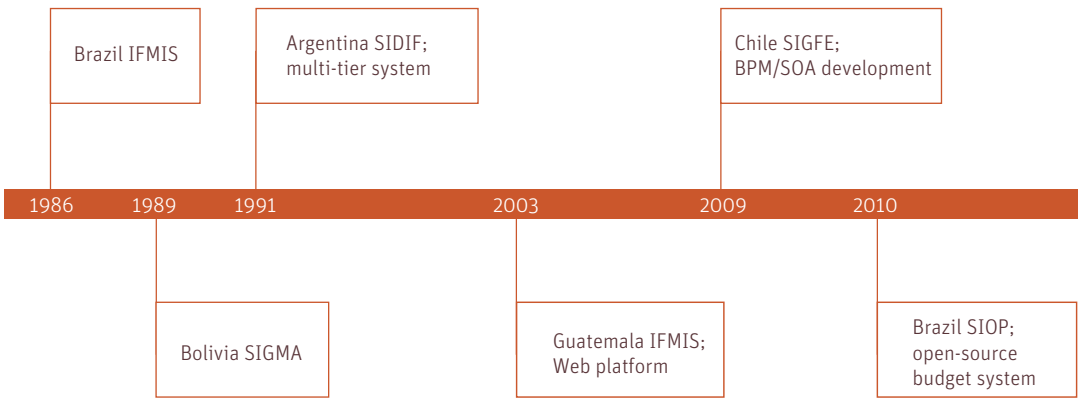
Some LAC countries have successfully implemented IFMIS (Argentina, Bolivia, Brazil, Chile, Guatemala, and Paraguay), whereas in others, implementation has been held back by conceptual or technological obsolescence, or by varying political support. It is also interesting to note that IFMIS have been updated frequently, as in Bolivia's case, where four different versions were launched between 1989 and 2011.

Updates have also been made to systems in other countries in the region, including Chile, Ecuador, Guatemala, Honduras, Nicaragua, and Paraguay.

After Brazil and Bolivia adopted their IFMIS, there were other significant milestones in the evolution of the system in the LAC region (Figure 3.1). In 1991, Argentina developed a multi-layer model IFMIS (Sistema Integrado de Información Financiera, or SIDIF), which represented a fundamental technological advance in the region. In 2003, Guatemala's IFMIS was the first to be designed on Web architecture. More recently, in 2009, Chile's IFMIS (Sistema de Información para la Gestión Financiera del Estado, or SIGFE) was implemented using business processes management/service-oriented architecture (BPM/SOA). Finally, in 2010, Brazil developed an innovative budget and planning system (Sistema Integrado de Planejamento e Orçamento, or SIOP) entirely through an open-source philosophy, although it concentrates solely on the budget preparation and excludes treasury management and accounting.

To better understand the evolution of IFMIS in the LAC region, two key drivers can be identified: (i) changes in fiscal management practices, often derived from fiscal reforms or public management paradigm shifts, and (ii) advances in the availability of new information and communications technologies. With regard to fiscal drivers, during the 1980s and 1990s, high inflation and profound financial crises affected most LAC countries. High levels of public borrowing and debt called for severe adjustments and gave rise to a wave of fiscal reforms aimed at containing and controlling public expenditures and improving the credibility of public financial management. Brusa (1996: 27) points out that "the economic emergency imposed the use of a centralized Cash Management System (CMS), which consists of projecting

FIGURE 3.1: IFMIS MILESTONES IN THE LAC REGION



Source: Authors' elaboration.

detailed and consolidated flows based on the shortest possible periods, even on a daily basis; control of revenue flows in line with the projections; control of expenditures according to the program; centralized management of public sector borrowing; and strict limits on variations in borrowing by central banks and public treasuries."

Governments in the LAC region have also become more interested in fiscal reform. Gradually, they have reformed their fiscal frameworks and stimulated the development and implementation of a single public information system that is standard and mandatory for all public agencies, which allows for greater monitoring and control of public expenditures. Although in theory these systems were designed for recording and executing treasury payments, they have rapidly begun to incorporate other basic functions, such as budget formulation and monitoring, financial planning, cash management, accounting, and other financial applications.

International organizations, such as the Inter-American Development Bank (IDB) and the World Bank, have supported these reforms, emphasizing the importance of centralized control over expenditures and promoting the creation and implementation of some of the early IFMIS. In the last 20 years, the IDB, in particular, has provided technical assistance and specific loans to support IFMIS in Argentina, Bolivia, Guyana, Honduras, Nicaragua, Panama, Paraguay, and Peru, among other countries, and has supported subnational IFMIS, specifically, in Argentina, Bolivia, and Brazil.

Regarding technology, during the 1980s and 1990s, the development of these systems took place predominantly in-house—in other words, either directly by government specialists or through government-hired contractors (or, in Brazil's case, through a public state-owned company). This was, above all, due to the technical limitations of the commercial systems available in the marketplace, which had been developed according to private sector requirements and needs (Dener, Watkins, and Dorotinsky, 2011). Later, the significant information technology progress in the 1990s (mainly the dissemination of network and Web architectures, and reduced hardware costs) contributed significantly to the expansion of IFMIS in the region.

From the second half of the 1990s onward, various factors made it easier to incorporate new information and communication technologies (ICTs). First, under the influence of new ideas of institutional economic thinking, such as New Public Management, and based on the experience of certain developed countries, strong institutional capacity and management became more recognized and valued in the public sector. Second, the wave of fiscal reforms began to take effect and lead to more balanced public finances. Third, the social demand for greater transparency and accountability and increased provision of services from the public sector began to grow.[1] These factors progressively stimulated public

[1] This increase is estimated through the World Bank and IDB spending reviews, which have increasingly concentrated on expenditure efficiency, budget quality, and financial management (Allen, Schiavo-Campo, and Columkill, 2004).

administrations to modernize their practices and instruments in public expenditure management to improve efficiency and effectiveness.

In response to these tendencies, IFMIS in the region became more integrated with other administrative functions and other independent systems, and management models were generated to improve the quality of government decision making. Most financial experts agree that public expenditure management processes are extremely interdependent. According to Figueroa (2001: 218), "In order for the design and implementation of a financial information system to be carried out successfully, coordinated actions must take place in the other related systems, such as procurement, administration, and the use of goods and services. Effective development and operation of each system will be directly influenced by the interrelated systems, both horizontally at the strategic level, as well as vertically at the sector and institutional level."

It will be possible to meet new demands in this area through a greater integration of computerized support systems and the introduction of innovations such as results-based management; strategic planning support instruments (e.g., the logical framework approach or similar); new forms of accounting based on accruals, decentralization, and delegation; and the upgrading of procurement procedures. These advances must be accompanied by an increase in public transparency, citizen participation, and anticorruption measures.

THE ANATOMY OF AN IFMIS

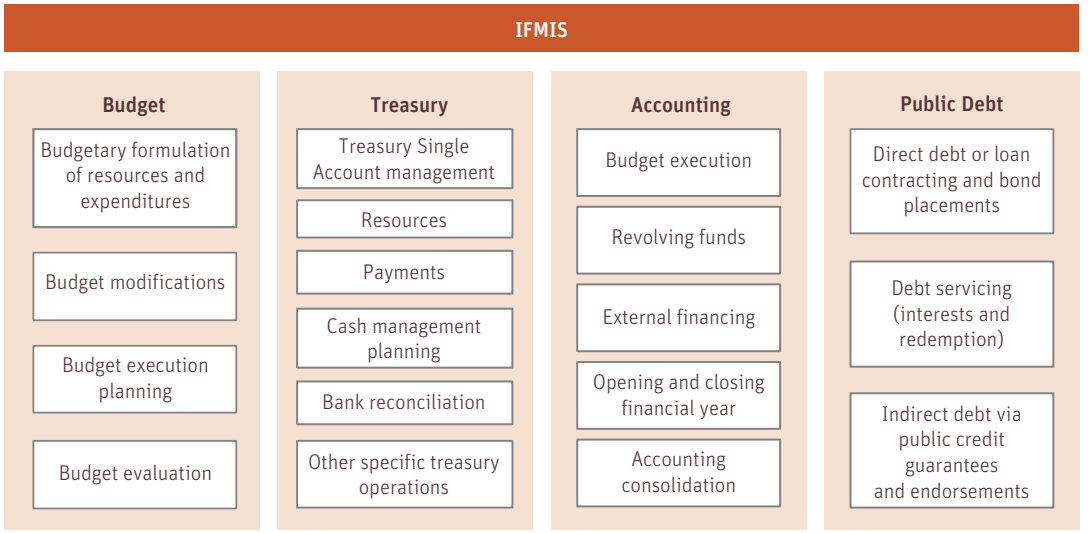
In general, the basic functionalities of an IFMIS can be summarized as budget, treasury, accounting, and public debt (Figure 3.2).

Budget

Through its budget component, an IFMIS coordinates resource allocation and expenditure execution using budgetary modification regimes and execution planning. This module supports budget formulation and monitors spending commitments, establishes expenditure ceilings for management units, and keeps the budget adjusted and up to date so that the accounts can be closed at the end of each financial year.

Usually, the budget execution system operates as much at the central level (within the national planning or the financial ministries) as at the sector agency level. The central system oversees government execution as a whole, whereas the sector agencies operate subsystems in order to monitor budget execution according to units, programs, projects, or activities, and to carry out expenditures at the agency level.

FIGURE 3.2: THE FUNCTIONALITIES OF AN IFMIS



Source: Authors' elaboration.

In the budget component, the following processes are worth highlighting: (i) budgetary formulation of resources and expenditures, (ii) budget modifications, (iii) budget execution planning, and (iv) budget evaluation. For its part, an advanced budget model can also have complementary features, such as non-financial information at all stages of the budget (e.g., products and outcomes) and more specialized functions to support budget drafting (e.g., scenarios, economic forecasts, political goals, sector-based expenditure ceilings and floors, sector agency expenditure proposals, projected revenues, annual budget consolidations, and medium-term macro-fiscal frameworks).

Treasury

Treasury transactions are a priority for procedural automation and include collection (revenues) and payments in particular, as well as cash management in general. The IFMIS treasury module generates a projected cash flow based on the revenue forecasts made by the revenue collection agencies and the funding needs that the expenditure units or agencies anticipate. The module displays the available funds to cover these commitments and controls their release. It can also issue and cancel bonds to finance government programs. The main processes of the treasury component are: (i) resources, (ii) payments, (iii) financial cash planning, (iv) bank reconciliation, and (v) other specific treasury operations.

Within the treasury component, the instrument known as the Treasury Single Account is the most important. The TSA includes all resources from the public agencies that carry out revenue collection and expenditures under the umbrella of a single account. According to Pattanayak and Fainboim (2010: 5), the TSA is "a unified structure of government bank accounts that gives a consolidated view of government cash resources. Based on the principle of unity of cash and the unity of treasury, a TSA is a bank account or a set of linked accounts through which the government transacts all its receipts and payments."

In general, the TSA is structured into various virtual bank subaccounts that are assigned to entities so they can make payments for expenditures without having to maintain separate physical accounts in the banking system. Centralizing management of the treasury cash balance allows for the integrated and timely use of all the available resources, thereby ensuring that entities are not left with idle financial resources that the central treasury cannot access.

In many cases, the diverse entities can use their system-connected terminals to issue payment orders directly drawn on the TSA, according to the source of financing and the centrally defined quotas. The central treasury prioritizes the quotas (in daily, weekly, or fortnightly form), and the system automatically authorizes the payments throughout the banking network. The TSA is updated as the treasury's financial program is executed (which includes revenue and expenditure planning and execution) and by the cleared transactions from the bank reconciliation. Thereby, the single account system reduces the incidence of idle resources and enables temporary surpluses to be invested in a money market.

There are many kinds of TSAs, depending on the degree of centralization of public revenues and expenditures. Brazil's system is the most comprehensive at the federal government level, given that it permanently centralizes the resources of all the ministries and decentralized entities in a central bank account and the system is updated online. Chile's TSA centralizes only revenues, given that, during the expenditure process, resources are transferred to the entities, which have full executive independence and can hold the funds outside of the TSA. All LAC countries have some kind of TSA that is more or less centralized. Some TSAs comprise only centrally collected revenues, and others include the resources collected by other decentralized agencies as well.

In an advanced IFMIS model, the treasury functions can include more efficient planning and cash management mechanisms and techniques, thereby minimizing short-term imbalance and financing costs, and optimizing possible earnings from financial investments. The final balance resulting from efficient cash management should be the lowest possible, without jeopardizing certain payment dates for contractors, suppliers, and civil servants. However, some TSAs in the region have an extremely high balance (in some cases, up to 5 percent of GDP), which diminishes the economic justification of centralizing those resources to obtain greater cash management efficiency. Central banks often take advantage of this situation, using the availability of idle public resources to manage monetary policy. With regard

to cash management and monetary policy, the IMF is currently examining the relationship and coordination between the treasury and the central banks.

Accounting

The accounting module is an important part of an IFMIS. Its basic processes are (i) to keep records of all authorized expenditures, (ii) to process transactions, (iii) to monitor real revenues and expenditures using the main ledger, and (iv) to produce the basic financial statements. The accounting module thereby integrates the budgetary, economic, financial, and patrimonial registers. This module must be capable of processing and recording all cash and non-cash transactions and transactions that affect (or might affect) the economic or financial situation of a public entity. Therefore, it is critical to clearly define each revenue transaction (accrued or cash), as well as all the uses of funds (e.g., fund allocations, commitments, accruals, and disbursements). The transactions are registered only once, and all budgetary, financial, and patrimonial information released is generated from this source. The expenditure-executing units are given access to the central database so they can gather information and process operations in the same place as the economic registry.

In general, conversion tables are used to integrate the accounting and budgeting modules, thereby enabling automatic accounting entries. Automated conversion is also possible by creating a table of events that establishes parity between each of the budget rubrics and the accounting chart of accounts (a procedure that offers greater transparency in budgetary execution and, thus, is recommended by the IMF).

The following processes in the accounting component are worth highlighting: (i) execution of the revenue budget, (ii) execution of the expenditure budget, (iii) double-entry bookkeeping, (iv) revolving funds, (v) administration of externally financed projects, (vi) year-end closing and opening for the following year, and (vii) consolidated financial statements. Apart from registering and processing economic and financial transactions, the accounting module can also generate consolidated statements based on the data gathered from other public financial management systems. For example, if the IFMIS needs to issue payroll checks to staff, but the payroll information in located in a different system, an interface between the two can be created to transfer the data to the IFMIS.

Public Debt

The public debt module includes the administrative procedures that arise from operations to secure financing and that imply borrowing or modification of the liabilities structure. These procedures include (i) direct debt or borrowing from contracting loans and issuing bonds, (ii) debt servicing (interest payments and redemption), and (iii) indirect debt, through guarantees and pledges given to public borrowing operations conducted at other institutional levels.

In some LAC countries, the public debt management system is a module within the IFMIS, whereas in others it operates separately (e.g., the Debt Management and Financial Analysis System [DMFAS] developed by the United Nations Conference on Trade and Development [UNCTAD]). Some countries (e.g., Brazil, Colombia, and Peru) combine treasury and debt management, thereby integrating the administration of revenues and payments with that of net financing.

What Functionalities Should Be Chosen?

There is no single criterion for defining an IFMIS operational reach. In the region, there are examples of basic IFMIS and more advanced models. An IFMIS can comprise distinct functions and be integrated (or not) with other systems and functions, according to the political context and organizational circumstances of each national or subnational government's administration (including the financial resources, human capital, and technological capacity). Another important question is the recommended level of functional integration among the budget, treasury, accounting, and public debt for each IFMIS. Although, from an operational perspective, the greatest possible level of integration is desirable, the financial cost of operating and maintaining total integration might outweigh the benefits.[2]

INTEGRATING IFMIS WITH OTHER ADMINISTRATIVE SYSTEMS AND FUNCTIONALITIES

It is increasingly common to promote integration or interoperability of IFMIS with other administrative systems and functionalities, such as procurement and tenders, payroll administration, asset management, public investments, and tax administration. Integration may be built on models integrated into the IFMIS itself, although it is more common to establish interoperability with auxiliary information systems, as described below.

Procurement and Tenders

The procurement and tenders system comprises a combination of principles, rules, mechanisms, resources, and procedures whereby the public sector can obtain the goods and services it needs to fulfill its

[2] For example, Brazil's IFMIS is clearly the most advanced in the region given that budgetary classification is fully integrated with accounting classification and the actions generated by the system are reproduced in all the account entries based on accounting rules and tables, which enables all the accounting to be automatically generated. However, the annual average cost of operating and maintaining Brazil's IFMIS is estimated at USD40 million, on top of the cost of dozens of accountants dedicated to permanently updating the rules and conversion tables, as well as all the staff who use the system.

mission and attend to social demands, in good time, at the best possible market price and with the required quality. This system is mainly linked to the IFMIS budget component through budgetary formulation (the annual procurement work plan) and through budget execution (via events, such as preventive actions, accruals and commitments, and procurement and contracts execution).

The LAC region has shown significant progress in procurement over the last 10 years, establishing new methodologies (e.g., framework agreements and reverse auctions) and new systems to operate these methodologies electronically (Electronic Government Procurement, or e-GP). This has only been possible as a result of links with the IFMIS, which reinforces the mandatory use of specific e-GP systems. Often, these links ensure that all relevant information from the procurement processes has been correctly fed into its specific system before payments can be released from the IFMIS.

Payroll Administration

The payroll administration system is a combination of regulations, resources, and procedures that enable efficient human resources administration in public institutions, aligning personnel policies and personnel management. This system is mainly linked to the IFMIS through budget formulation (wage costs estimates and appointments to posts, and modifications to both throughout the year) and execution (salaried staff accruals and commitments), as well as payroll payments.

Any civil service modernization project in the LAC public sectors should implement payroll systems with similar characteristics of IFMIS (single and standardized system, centralized management, and decentralized operation), as such systems calculate the exact number of staff and their salary costs, and can stimulate the economic impact of modernization proposals (e.g., the creation of specific careers or increasing staff salaries or benefits).

Asset Management

The asset management system combines the regulations, resources, and administrative procedures that intervene in managing the public physical goods, such as real estate, vehicles, and valuable office equipment, among other goods. The asset management system can have two main components: administration of assets and inventory management. The relationship between this system and an IFMIS is mainly in the accounting component through the patrimonial adjustments from the investment, disposition, depreciation, or acquisition of public assets. The asset management system is one of the least developed systems in the LAC region.

Public Investments

The public investment system coordinates and regulates the planning and management of public investment programs and projects. It combines all the methodologies, regulations, and procedures that guide

the formulation, execution, and evaluation of investment programs and projects carried out with public funds (associated or not with the private sector), with the aim of aligning them to national growth and economic development strategies and policies. This system is linked to an IFMIS mainly by providing information to the IFMIS to formulate investments and their budgetary modifications, and from the IFMIS to the investment system through budgetary execution.

The public investment system component that has shown the most progress in the LAC region in recent years is the one dealing with the pre-investment phase, which includes project feasibility studies, as well as economic, social, and environmental impact analysis. Problems persist with monitoring the execution, mainly with regard to the physical execution of the projects and their impact.

Tax Administration

The tax administration system is the combination of regulations and processes that are used to determine, collect, record, and classify both tax and nontax revenues that have an economic and/or financial impact on the national treasury. In some cases, the system can also help identify noncompliance or enforce compliance with obligations. This system relates primarily to the budget component of IFMIS during formulation (through tax revenue estimates) and in budget execution accounting (for accruals and revenues collected). It is also linked to the treasury component through tax and duty collection, and bank reconciliation. Likewise, it relates to the accounting module with regard to registering and monitoring taxpayers' tax arrears.

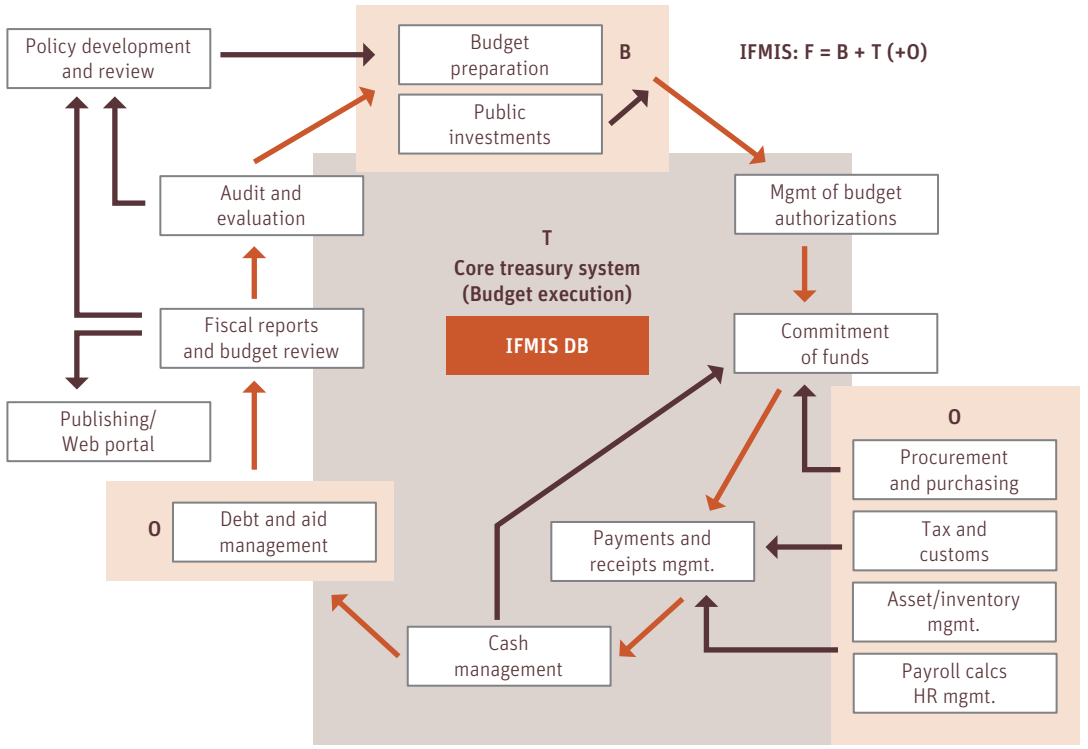
The Level of Integration and Interoperability in LAC Countries

The most advanced IFMIS models seek to integrate or make interoperable their basic functions with the administrative functions of other systems for the following reasons: to guarantee a more homogenous flow of information, to speed up management processes with single data registries (avoiding registry duplications and reducing costs), to ensure the quality and consistency of the available data, and to support decision making in a more secure, transparent, and systematic manner. In an advanced model, an IFMIS scope is determined by the way these multiple functions are related to and complement one another (Figure 3.3).

In the LAC region, the level of integration between the IFMIS and the administrative systems is still low (Table 3.1). The IFMIS in Bolivia and Brazil are the most integrated in the region. In other countries, the IFMIS are most frequently integrated with the procurement or payroll systems.

The advisable level of integration between the IFMIS and other systems is the subject of debate in each country. Enterprise Resource Planning (ERP) and Government Resource Planning (GRP) systems combine different administrative functions within a single computerized application, but integration with these systems is more common at the subnational and municipal levels. Usually, all IFMIS seek a minimum

FIGURE 3.3: A MODULAR APPROACH FOR BUILDING IFMIS



Source: Dener, Watkins, and Dorotinsky (2011).

level of interoperability with other existing administrative systems to guarantee greater efficiency in public expenditure flows and processes, thereby avoiding duplicate efforts and ensuring the consistency of information for decision making.

WHAT AN IFMIS NEEDS

There are numerous examples of failed IFMIS implementations throughout the world, especially in Africa. The main causes for these failures include lack of capacity to assess the institutional context, a disproportionate emphasis on technology, and the absence of key fiscal reforms (whether political, regulatory, or organizational) (Diamond and Khemani, 2005).

TABLE 3.1: ONLINE INTERFACES OF IFMIS WITH OTHER ADMINISTRATIVE SYSTEMS, 2010

COUNTRY	AUXILIARY SYSTEMS WITH INTERFACES					
	PROCUREMENT	STAFF PAYROLL	FIXED ASSETS	INVENTORY	PUBLIC INVESTMENTS	TAX ADMINISTRATION
Bolivia	X	X			X	X
Brazil	X	X	X		X	X
Chile	(1)	X			(1)	
Colombia						
Costa Rica	X	X				
Guatemala		X	X			
Dominican Republic	X					
Honduras	X					
Paraguay	X					
Peru	(2)					

Source: Authors' elaboration.
(1) In Chile, work is underway on interfaces between the IFMIS, ChileCompra, and the Banco Integrado de Proyectos.
(2) In Peru, the system is distributed within the entities, and the interfaces are maintained in each entity but not with the central IFMIS.

Peterson (2006) distinguishes two approaches to implementing an IFMIS: (i) reform based on process change, which attempts to develop and transform the existing workflows and processes through information technology, and (ii) process innovation (also known as business process reengineering), which entails radical and comprehensive workflow and process reengineering. The first approach tries to improve existing conditions, whereas the latter seeks to replace them.

The more ambitious approach—process innovation—has led to several of the failed experiences on IFMIS implementation in developing countries. According to Diamond and Khemani (2005), the replacement of existing processes can sometimes feel threatening to the individuals that operate them and, therefore, create a great deal of resistance. Furthermore, the fact that bureaucracies in developing countries tend to have less capacity and knowledge for using new technologies aggravates the problem, because responsibility for system design is frequently handed over to a supplier, which may disregard political and organizational conditions and allow technical details to be the only aspect considered in the product design and implementation. The process reform approach takes existing settings and the limited capacity of public administration into consideration. This approach allows for the gradual strengthening of existing processes and capacities, thus involving less inherent risks than process innovation.

However, there are some risks in designing and implementing process reform, particularly the danger that existing processes will not be improved. In Ghana, for example, the manual processes for budget execution and accounting were automated with no improvements. Obviously, the mere application of information technology tools does not solve the problems of processes that are already underway.

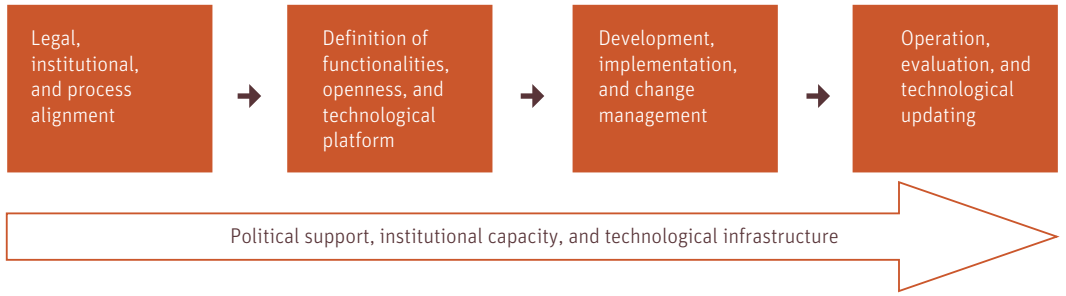
There are indispensable conditions for IFMIS implementation, including political support at the highest level, which counteracts resistance to change and guarantees sustained allocation of the necessary resources (whether financial, organizational, human, or technological). Institutional fragmentation and inertia are common characteristics in large bureaucracies. In the absence of decisive political support and an adequate change management process, organizational units that feel their independence and power is being threatened may interrupt the IFMIS implementation. Bureaucratic resistance to change can become even stronger in projects aimed at integrating IFMIS with other information systems that are managed by agencies with different organizational mandates and institutional cultures. Another indispensable condition is a good conceptual design. Governments often rush to get systems up and running, while forgetting the importance of previously defining and agreeing on the goals, operational reach, and institutional scope. Likewise, it is vital that the conceptual definition is in agreement with the existing legislative framework.

Other fundamental preconditions for IFMIS implementation are good project management (including in terms of the plan, the budget, and the management strategy), an appropriate implementation sequence, and suitable decisions concerning technology (information system architecture; custom-made design strategy or an off-the-shelf, commercially available system; criteria for hardware and software acquisition; system maintenance and operation strategy; aggregation of modules; and consultant and advisor employment) (Khan and Pessoa, 2009).

It must be remembered that an IFMIS implies profound public sector reform and requires not only regulations, methodologies, and development of computerized tools, but also a cultural change in the daily management of public administration that might take years to fully complete (Dener, Watkins, and Dorotinsky, 2011). Formal compliance with the regulations must be accompanied by total application of efficiency and effectiveness criteria in civil service management. Therefore, it is essential that training processes be focused on transmitting not only knowledge of methodologies, tools, and procedures, but also behavioral guidance. Civil service employees must feel themselves to be at the service of society, administering the financial resources that have been entrusted to them. There can be no successful reform without a wide, wholesale training and change management plan.

A new management module may require redefining the role of certain administrative units and public agencies. Furthermore, it requires a human resource development strategy, preferably based on a professional, well-paid, and committed civil service and public management team. These requirements contribute as much to the success of the reforms as to their sustainability.

FIGURE 3.4: REQUIREMENTS FOR IFMIS IMPLEMENTATION



Source: Authors' elaboration.

In summary, international experience demonstrates that IFMIS must be designed and implemented within a context of a wider reform. Along with adequate preparation, a clear definition of the plan of action, and provision of the necessary financial, human, and technological resources, the following basic requirements are critical: (i) a clear and explicit definition of the conceptual and methodological framework to be adopted in the reform process; (ii) widespread awareness-raising and training for the different political, managerial, and technical levels of the public bureaucracy involved; (iii) firm, explicit, and unwavering political support at the highest level for the reform process, which guarantees transparency and disclosure throughout the process; and (iv) rapid, reliable, and sustainable results that encourage the necessary political support. Figure 3.4 presents the requirements for IFMIS implementation in their most effective sequence.

TECHNOLOGICAL ADVANCES IN IFMIS[3]

Technological advances have made a wide variety of resources available to the public sector for designing and implementing IFMIS, such as hardware and software architectures, which are increasingly being used in the LAC region.

[3] This section only examines the technological advances in central government administration IFMIS, not those in regional or municipal administration or private enterprises.

Technological Architectures

Monolithic programming architecture

In a monolithic programming architecture, the applicable software is not distributed either physically or logically, but resides and is executed in central computer mainframes. Users have terminals to gain access to data, and access to the databases is generally conducted online. In this scheme, the databases are completely centralized. Brazil's IFMIS is an example of a system that uses this kind of architecture.[4]

Monolithic programming architecture was widely employed in the 1970s and 1980s. At present, the large corporations (such as the banking corporations) continue to use it for practical reasons (the applications are simple and therefore quick to execute), both in terms of security and because of the specialized nature of the proprietary software used for certain kinds of businesses. Today, instead of using terminal workstations to access a database, personal microprocessors are used with terminal emulation software. In this model, the quality of the connectivity clearly determines the system's performance.

Client-server programming architecture

In client-server programming architecture, the software applications are physically and logically distributed throughout distinct equipment, which can be medium-sized servers (central or distributed) or personal computers. They access the information via their computers, and the databases are either distributed across different servers or centralized.

Uruguay's IFMIS (sistema integral de información financiera, or SIIF) uses client-server programming architecture. Institutions access databases that are centralized at the Ministry of Finance in real time using teleprocessing. The application software is updated daily on the servers at each institution, and the local users can access the institutional servers via their personal computers.

The client-server technology was commonly used throughout the 1990s, but today, most consider it to be outdated. Most IFMIS in the LAC region that once used this technology have moved toward a multi-tier programming architecture.

Multi-tier programming architecture

In multi-tier programming architecture, the business programming logic (business logic) is separated from the physical design (design logic). Generally speaking, there are three separate tiers: (i) the presentation tier, which displays the screens to enter or consult information on the user's personal computer (this tier only connects to the business tier); (ii) the business tier, where the different applications that make up the business and its operation rules reside (this tier is connected to the presentation tier to receive

[4] In recent years, Brazil has been gradually modernizing this architecture.

requests and deliver results, and with the data tier to ask the database manager to either store or deliver information); and (iii) the data tier, where data recording and information requests are administered (this tier is connected only to the business tier). Multi-tier programming architectures have been disseminated over the last 10 years and currently are used in most of the IFMIS in LAC countries, for example in Argentina, Guatemala, Honduras, Nicaragua, and Paraguay.

Service-oriented architecture

Service-oriented architectures, which have been under development for more than two decades, are based on considering an organization's total business volume as a combination of diverse services of lesser complexity, analogous to processes or businesses. These individual services are easier to develop and maintain technologically, with lower operating and maintenance costs over the long term. Furthermore, this architecture does not discriminate between the technologies on which the different businesses are constructed, which means that the antiquated systems (legacies) can continue to function within the service-oriented architecture.

The keys to harmonizing the different components within a service-oriented architecture are the interfaces established between them under international standards (XML Web). These interfaces simultaneously provide the interoperability and flexibility that are needed for changes in software in the different services. This architecture is highly compatible with Java programming languages, as well as system design and development methodologies, such as business process management.

The service-oriented architecture and the business process management methodology support the final system user, who goes on to directly manage the design of workflows and business rules, thereby reducing the user's dependence on high technology areas when it comes to making changes to the system. In the LAC region, the IFMIS of Bolivia (modules of the new version of SIGMA in a Web platform), Chile (SIGFE II), and Peru (initially the budget formulation component) are being developed within a service-oriented architecture and using a business process management methodology.

Centralized and distributed database architectures

In centralized database architecture, IFMIS databases reside in centralized equipment, which is generally located within the treasury. Users can access these databases from their terminals or personal computers in real time through communication lines (e.g., dedicated networks, commuted networks, or the Internet). The majority of IFMIS in the region work with centralized databases.

Distributed database architecture consists of databases located in diverse institutions. They are interconnected through the Internet, allowing for electronic data validation and exchange. This technology demands a high availability of communication lines to connect the systems with the servers and, as of yet, there have been no experiences of this kind in the LAC region. There are, however, distributed

databases without online interconnection. One example is Peru's IFMIS which, within a client-server architecture, maintains servers and databases throughout various entities, which the users can access through their company networks. The software resides in both the users' computers and the institutional servers. The institutions update a central database at the Economics and Finance Ministry using batch processing with asymmetric delay.

Distributed database architecture runs the risk of generating inconsistencies, given that institutional information is not validated online against the central databases. Moreover, the security system becomes weak because users carrying out transactions in the entities cannot be accurately identified at the central level. Furthermore, this architecture is costly, given that the institutions must have specialists on staff to maintain applications and operate the systems, and also have operating hardware and software of an appreciable quality (servers).[5]

Strategies and Tendencies

In general, IFMIS in the LAC region have evolved alongside the technological architectures. In the 1980s and 1990s, nearly all the IFMIS in the region were implemented using monolithic or client-server programming architectures. Implementation of multi-tier programming architecture began only toward the end of the 1990s. The establishment of multi-tier IFMIS using the Internet began in the early 2000s.

Custom made or off-the-shelf?

Aside from the architecture used, in the 1980s and 1990s, nearly all IFMIS in the LAC region were implemented using in-house development. At the end of the 1990s, governments began hiring companies to build the systems; however, these systems continued to use custom-made rather than commercial software. The local design alternative basically operates with two contracting models: (i) hiring expert IFMIS conceptual staff and expert IT staff or (ii) hiring a consulting company that, in turn, subcontracts expert IFMIS conceptual staff and IT personnel. Argentina, Bolivia, Brazil (through a public state-owned company), Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay, and Uruguay have used the first alternative.[6] Even though this option can be less costly, it can be difficult to hire and maintain a large technical staff, and such systems can produce enormous institutional inertia, dragging out implementation in many cases.

Chile, Colombia, and, more recently, Peru have used the second option. In particular, Peru contracted a private company to handle budgetary formulation. Although this option might bring higher short-term

[5] The above characteristics of Peru's IFMIS refer to the system that was in operation at the beginning of 2011. The government expects to launch a new system that will solve these problems in 2012–13.

[6] Ecuador recently adapted an IFMIS that was provided by Guatemala.

costs, it reduces the government's dependence on large groups of technical staff and may be less costly over the long run.

Integrated financial information systems solutions

Along with the aforementioned alternatives, there are integrated financial information systems offered in the marketplace that can be adapted by public agencies. ERP has been used increasingly throughout the private sector since the 1990s and has now been adapted for the public sector. It is available from market operating system providers under the GRP designation.[7]

ERP systems are integral management systems that are appropriate for any organization. They comprise modules that offer different functionalities, such as production, sales, purchases, logistics, accounting (of various kinds), project management, Geographical Information Systems (GIS), inventories and warehouse management, and payroll. ERP systems integrate different administrative functions into a single application.

In contrast to other business software systems, ERPs are integral, scalable, modular, and adaptable. Although there are varieties of ERPs in the market, including GRPs, in the LAC region, only Costa Rica has adopted this technology as an IFMIS solution with a System Application Programming (SAP) system.[8]

Some OECD member countries, such as Germany and Spain, operate GRP systems that integrate the maximum possible number of administrative functions and standardize the flow of information from organizations, either by incorporating different modules into the same system or by establishing technical requirements that guarantee interoperability between different systems.

In Europe, more recently, France has implemented a GRP-style IFMIS (Project Chorus/SAP), but at a cost that is too high for LAC countries. The total investment was about EUR 500 million, of which EUR 30 million went to paying licenses, EUR 150 million to adapting the system, EUR 120 million to hardware, and EUR 200 million to training and managing the changeover.[9]

Source code ownership

Another question that must be settled when implementing an IFMIS is who owns the source code. Closed-code software is also known as proprietary software, and thus redistribution or modification is prohibited. Therefore, proprietary software makes the buyer dependent on the provider. Though proprietary

[7] The main motives for adopting an ERP in the public sector are to integrate information and enhance process efficiency (Raymond, Uwizeyemungu, and Bergeron, 2005).

[8] In Guyana, the system developed by the company FreeBalance is used, which has ERP characteristics. However, it does not cover all the functions of integrated resource management and concentrates mainly on the budget and accounting.

[9] These amounts are approximate and are presented as a general reference for the costs involved.

software also involves licensing costs, it is generally well produced, is available in the marketplace, and competes in terms of price and quality with similar software solutions.

Free or open-source software, on the other hand, means the source programs can be modified for any use, and copies can be redistributed to other potential users. Some types of license may entail a cost, but this is unusual or the cost is very low. The only cost is for support and maintenance, and in return the user gets a product that works well and is always updated. Occasionally payments may be required for product distribution.

Since the end of the 1990s, the use of open-source software has been increasing among public agencies in LAC countries, such as Argentina, Brazil, Chile, Ecuador, the Dominican Republic, and Venezuela. This transition was mainly because universities began to work with this kind of software (making it better known and disseminated), the price was attractive, and companies offering technical support began appearing in the market. With regard to IFMIS components or auxiliary systems in particular, there have been various experiences of using free software in the region, such as central administration budget formulation in Argentina and Brazil, and the tax system in Colombia (see, for example, the MUISCA system: http://www.dian.gov.co/content/muisca/muisca.htm). In general, open-source software is cheaper than proprietary software, and the agencies that adopt it see significant savings. For example, in 2008 alone, Brazil's government estimated that it saved around BRL 30 million (around USD18 million) by using open-source software (IDG NOW, 2008).

In many cases, once one of the central administration's public agencies has adopted proprietary software that is considered to be of strategic value, it is difficult to change thereafter, unless the strategic solution is to be renewed or has come to the end of its useful life. However, the agencies can also adopt mixed software, which is used, for example, in integrated development environments (operating systems and application servers that use open-source software but with proprietary database managers).[10] It is worth noting that providers are also manufacturing mixed solutions based on open-source software (such as Java), which may end up as proprietary products that entail a licensing cost.

Defining the type of software to be acquired or built by a public entity must be based on technical studies, an evaluation of the availability of these tools and providers in each country's market, and the staff's familiarity with them (as in Brazil's case, where open source it is already well developed), as well as on each institution's information technology policies. Notably, whereas a little more than 10 years ago there were no significant applications constructed with open-source software technology in the LAC region, today there are several initiatives. Possibly, over the medium and long term, the mixed use of open-source and proprietary software will combine the advantages of low costs, adaptable source programs,

[10] This solution is being applied to the development of the Bolivian government's new SIGMA-Web and will thereafter be extended to the subnational governments.

Box 3.1: Recent Open-Source Software Initiatives in the LAC Region

Argentina's Ministry of Economy (MECON) is developing its new version of SIDIF as a Web platform with an open-source code system, multi-tier architecture, and a centralized database. The new SIDIF already functions as a Web platform using a gradual implementation process that began in 2005, and foresees the replacement of all the outdated functionalities. The budgetary formulation and modification modules are already developed. MECON has opted for a custom-made development that includes technical support from outsourced experts. The objective is for the SIDIF-Web to support implementation of a results-based management model at the central government level based on operational decentralization and linking financial allocations with the achievement of program goals.

For its part, in 2010 **Brazil's** Ministry of Planning, Budget, and Management adopted an open-source system to support annual budget formulation and the federal government's pluriannual plan. The Ministry developed the innovative system, SIOP, in Brazil with technical support from the University of Brasilia. Through the use of free software, which allowed the complex tendering processes, the government saved both time and money. The goal is to keep perfecting the SIOP until it can satisfy government sector needs, enhance transparency, and offer new functionalities for the federal planning process.

and the technical facilities of open-source software alongside the maturity, stability, executive velocity, operational guarantees, and technical support provided by proprietary software.

A Snapshot of the Region

In 2009–10, the IDB surveyed 13 countries in the LAC region to evaluate the current state of the information technologies used by LAC governments in their respective IFMIS. Table 3.2 summarizes the technological aspects of the information revealed by the survey.

TOWARD A HIGH-QUALITY IFMIS

An analysis of the functionalities section of the aforementioned IDB survey (Solarte, 2010) identified the IFMIS in Argentina and Brazil as the most advanced in the LAC region, followed by those of Bolivia, Chile, Guatemala, Honduras, and Paraguay, which have reached intermediate levels of development and are

TABLE 3.2: USE OF TECHNOLOGY IN IFMIS IN THE LAC REGION

COUNTRY	SYSTEM	TECHNOLOGY	COMMENTARIES
Bolivia	SIGMA	Multi-tier	Web version began operating in 2011.
Brazil	IFMIS	Mainly monolithic or client-server type, with some Web applications	There are projects underway to update the IFMIS. In 2010, the budget system was updated using open-source software (SIOP).
Chile	SIGFE	Multi-tier 100% Web	BPM/SOA, Java, Oracle, 100% Web. Second version del SIGFE under development in 2010 and 2011, with some entities already up and running.
Colombia	SIIF	Web (2011 version)	Microsoft software products, 100% Web, in operation since 2011.
Costa Rica	SIGAF	Multi-tier, Web	Software supplied by private company (SAP). The region's only ERP.
Ecuador	SIGEF	Multi-tier 100% Web	Adapted based on a donation of Guatemala's IFMIS.
Guatemala	IFMIS	Multi-tier 100% Web	100% of functions have already migrated to the Web.
Honduras	IFMIS	Multi-tier	The system is new, but not 100% Web.
Nicaragua	SIGFA	Multi-tier, Web + other types of networks	The acquisition of a new system from market (available for sale) foreseen for 2012.
Paraguay	IFMIS	Multi-tier, SOA	
Peru	IFMIS	Client-server, decentralized database	New system in development in 2011 and 2012 with BPM/SOA will be 100% Web.
Dominican Republic	SIGEF	Multi-tier, Web	
Uruguay	SIIF	Client-server	An operational and technological evaluation of SIIF was conducted in 2008, aimed at defining a modernization strategy.

Source: Authors' elaboration.

not necessarily listed according to the level. The IFMIS in Costa Rica, the Dominican Republic, Nicaragua, Peru, and Uruguay are slightly less mature.

A good IFMIS is no guarantee of good financial management in its widest sense. It is possible to assess a country's public financial administration through evaluations of the Public Expenditure and Financial Accountability (PEFA) program (see www.pefa.org). The objective of the PEFA studies, generally assessed by multilateral agencies or international donors, are to guide reforms to improve institutional capacity for fiscal management (including public spending, procurement and tendering, and financial systems) and to enhance transparency and accountability. In the LAC region, 12 countries have validated and published the results from PEFA evaluations (Table 3.3). Many other countries are in the preparation and discussion stage.

If these results are evaluated in aggregate,[11] three groups of countries emerge: (i) the countries most advanced in public financial administration (Brazil, Colombia, El Salvador, and Peru); (ii) an intermediate group (Bolivia, Honduras, Paraguay, and Trinidad and Tobago), and (iii) the lowest-scoring countries (Belize, the Dominican Republic, Haiti, and Jamaica). Although the PEFA analysis of financial administration corresponds with the study of IFMIS conducted by Solarte (2010) in some cases (e.g., Bolivia, Brazil, Honduras, Paraguay, and the Dominican Republic), many of the PEFA indicators that measure the quality of public financial administration in a national or subnational government can also be used to measure the effectiveness of IFMIS functionalities. However, to measure efficiency and other characteristics, other indicators are needed (see Box 3.2).

The availability and analysis of the PEFA indicators, complemented by other specific IFMIS indicators, are important both for the design of a new IFMIS and for monitoring and evaluating its implementation and operation.

[11] If the number of good results (A or B+) per country, or the points correlation according to type of qualification (A = 4; B+ = 3.5, B = 3, C+ = 2.5, and so on), are added, then the same result is obtained.

TABLE 3.3: PEFA EVALUATION RESULTS IN THE LAC REGION

		BELIZE	BOLIVIA	BRAZIL	COLOMBIA	DOM. R.	EL SALVADOR	HAITI	HONDURAS	JAMAICA	PARAGUAY	PERU	T. AND TOBAGO
Indicators		**2009**	**2009**	**2009**	**2009**	**2007**	**2009**	**2008**	**2009**	**2007**	**2008**	**2009**	**2008**
1. Budget credibility													
PI–1	Result of aggregate expenditures compared to original approved budget	B	B	B	A	D	C	C	A	B	C	B	B
PI–2	Deviation of budgetary spending compared to original approved budget	A	C	A	B	C	B	C	B	C	B	C	C
PI–3	Desviation of Total Revenue compared to original approved budget	A	A	A	A	A	A	D	A	A	A	A	A
PI–4	Balance and monitoring of expenditure payment arrears	D	NS	A	D+	B+	B	D+	C+	NS	B+	C+	B+
PI–5	Budget classification	C	A	A	C	B	C	B	A	A	B	B	C
2. Exhaustiveness and transparency													
PI–6	Sufficiency of the information included in budgetary documentation	C	C	A	A	C	A	C	C	C	C	A	B
PI–7	Volume of governemental operations included in budget reports	D+	A	A	A	C+	A	NS	D+	C	D+	A	A
PI–8	Transparency of inter-governmental fiscal relations	D	C+	A	B	A	B+	NS	C	C+	B+	A	B+
PI–9	Supervision of aggregate fiscal risk provoked by other public sector entities	D	C	C+	B+	D+	C+	NS	D+	A	C	B+	A
PI–10	Public access to key information	C	B	A	B	B	B	C	C	B	A	A	B
3. Budget-based policy													
PI–11	Orderly nature of, and participation in, the annual budgetary process	B	D+	A	B	D+	B	B	A	B	A	A	C+
PI–12	Pluriannual perspective in fiscal planning, budget, and expenditure policy matters	D+	C	C+	B+	D	C+	D	C+	C+	D+	B	C+
4. Predictability and monitoring of budget execution													
PI–13	Transparency of taxpayer securities and liabilities	C+	B+	A	B	B	B	B	B	B	C+	B+	B+
PI–14	Effectiveness of taxpayer registration and assessment of tax base	C	B+	B+	B	B	B	C	B	C+	C	A	B+
PI–15	Effectiveness in tax collection matters	D+	B+	B+	D+	A	B+	C	D+	D+	D+	D+	D+

continued ⟶

TABLE 3.3: PEFA EVALUATION RESULTS IN THE LAC REGION (*continued*)

		BELIZE	BOLIVIA	BRAZIL	COLOMBIA	DOM. R.	EL SALVADOR	HAITI	HONDURAS	JAMAICA	PARAGUAY	PERU	T. AND TOBAGO
Indicators		**2009**	**2009**	**2009**	**2009**	**2007**	**2009**	**2008**	**2009**	**2007**	**2008**	**2009**	**2008**
PI–16	Certainty about the availability of funds for earmarked expenditures	D	C+	C+	A	D+	B+	D+	C+	D+	C+	B+	B+
PI–17	Bookkeeping and management of cash, debt, and guarantee balances	C+	A	A	B+	B	B	D+	B+	B+	B+	B+	A
PI–18	Effectiveness of payroll monitoring	D+	D+	B+	C+	D+	A	D+	C+	D+	D+	B+	C+
PI–19	Competition, reasonable prices, and monitoring in area of procurement	D	B	B`+	B	D+	A+	NS	B	C	B+	B+	D+
PI–20	Effectiveness of internal monitoring of non-payroll expenditures	D+	D+	A	B	D+	B+	C	C+	D+	D+	B+	C+
PI–21	Effectiveness of internal auditing	D	C	A	C	D	C+	D	C	D+	D+	C+	C
5. Accounting, recording, and notification													
PI–22	Timeliness and regularity of account reconciliation	C	B	A	NS	B	B+	D	A	D+	C+	B+	B
PI–23	Availability of data regarding resources received by the service provision units	D	D	A	B	B	B	D	D	C	C	D	D
PI–24	Quality and punctuality of the current year budget statements	D+	C+	A	C+	D+	B+	D+	B+	C+	C+	C+	A
PI–25	Quality and punctuality of the annual financial statements	D+	D+	C+	A	D	A	D+	B+	D+	C+	A	C+
6. External monitoring and auditing													
PI–26	Scope, nature, and monitoring of external auditing	D	D+	C+	B	D+	C+	D+	C+	C+	C+	B+	B
PI–27	Legislative scrutiny of the annual budget laws	D+	D+	A	C+	D+	C+	C+	C+	B+	B+	B+	D+
PI–28	Legislative scrutiny of the external audit reports	D+	D	D	D+	D	D	NS	D+	C+	D+	C+	D+
7. Donor practices													
D–1	Predictability of direct budgetary support	C+	NS	NS	NS	B	A	D	C	B+	C+	A	NS
D–2	Financial information provided by donors for budgeting and reports on aid projects	D	C	NS	NS	D+	D	NS	D	C	D+	C	D
D–3	Proportion of aid administered via the use of national procedures	D	C	NS	NS	D	D	D	D	D	C	D	D

Source: PEFA.

Box 3.2: Examples of Indicators to Evaluate IFMIS

Coverage of entities: Percentage of the total number of central administration entities that uses the same IFMIS.

Coverage of budget: Percentage of the budget administered by the central administration entities that uses the same IFMIS.

Real time access: Percentage of the central administration's executive units that operate in the IFMIS in real time.

Payments: Amount of payments issued by the IFMIS, whether manually or electronically (excluding the payments of individual salaries to each civil servant, and assuming the total disbursements to entities to be a single payment), divided by the total number of governmental payments.

Electronic payments: Amount of payments that are issued electronically by the IFMIS directly to suppliers and contractors, divided by the total number of payments made by central administration entities.

TSA: Total number of central administration bank accounts held outside of the IFMIS.

Bank reconciliation: Total number of accounts that are electronically reconciled at the treasury, divided by the total number of central administration bank accounts.

Automatic accounting: The system enables the accounting entries to be obtained automatically.

Alignment of classifiers: Budgetary and accounting classifiers (charts of accounts) and procurement catalogue.

Interoperability: Number of electronic interfaces with other systems (e.g., procurement, payroll, asset management, investment, projects management, revenue collection, and macroeconomic projections).

Number of users: Total number of active registered users (or number of access codes).

Number of transactions: Average monthly number of IFMIS transactions.

Costs: Development, implementation, operating, and maintenance costs.

Source: Authors' elaboration.

CONCLUSIONS, TENDENCIES, AND CHALLENGES

The IFMIS model, as a single public financial management system in combination with a TSA, continues to be predominant in the LAC region. This model arose as a response to the financial crises of the 1980s and 1990s, and contributed to macroeconomic stability and fiscal responsibility. It has been adopted continuously since then because it has also helped promote improvements in decision making, transparency, and the modernization of public management. However, there is an ongoing debate about each particular country's most appropriate level of integration with regard to an IFMIS's basic functionalities (budget, treasury, accounting, and public debt). In general, a greater degree of integration will lead to better standards of public expenditure monitoring, better-quality information, and more efficient working processes. However, the costs of total integration and automation are considerable, both for implementing the system and for operation and maintenance.

The IFMIS evolution in the LAC region has been affected by the changes in the direction of public administration, which has evolved from an approach that merely emphasized legality and formal controls into a management-based approach. This approach stresses the need for good-quality information to support decision making. These changes imply the need for the incorporation of new management instruments and information technology.

The integration or interoperability of an IFMIS with other administrative systems is still in its infancy in the region. There is clearly more progress to be made toward implementing decision making processes based on information generated by integrating an IFMIS with other governmental administrative systems. However, despite the advancements in the area of procurement and tenders, and with payroll systems, there has been little integration in terms of administrative systems. Although there have been many attempts to advance in this area, and there is a visible tendency toward greater interoperability, obstacles that go beyond technology and implementation costs, such as the traditional bureaucratic incentives toward institutional fragmentation, have been difficult to overcome.

The strategic requirements for establishing or renewing an IFMIS go beyond mere technology and project management. In general, more effectiveness can be achieved through wide-ranging reforms that have clear action plans, and by providing the necessary financial, human, and technology resources. Furthermore, it is crucial to carry out widespread awareness-raising and training at the different political, managerial, and technical levels of the public bureaucracy, and there must be political support throughout the reform process, thereby guaranteeing transparency and data dissemination throughout the project's lifecycle.

Regarding technology, various LAC countries have begun to update their IFMIS to migrate to more modern information technologies involving software, hardware, and networks, areas in which technologies based on Web architectures predominate. Most of the region's IFMIS have been, or are being,

developed locally, with or without the outside support of systems development companies. When this operation is carried out exclusively with individual consultants or civil service employees, although the short-term costs tend to be lower, they might increase in the long term due to the institutional inertia generated. Hiring consulting firms to develop specific modules, however, tends to augment the integrality of the system, with a single general manager for all products development, and a more independent overall view of the process.

This situation might change in the coming years, thanks to the interest shown by some software companies to develop specific systems for the public sector. However, it is still hard for a commercial system to fulfill all of a country's specific functional needs, which means that countries tend to mix the in-house development alternatives with those found in the market to cover all the required functions of public financial management.

It is not possible to apply any type of solution without thorough analysis of the context and the costs involved. The debate around relying on in-house development solutions (with or without the support of consultancy firms), as opposed to off-the-shelf systems available in the marketplace (systems that can be purchased), must always be informed by a technical cost–benefit analysis. However, the ERPs and GRPs offered for sale in the market increasingly appear to provide an alternative, mainly for smaller-scale cases, such as, for example, subnational governments.

With regard to the technological options for information technology development, there is a growing tendency toward using business processes management/service-oriented architecture (BPM/SOA). The commercially available tools that generate information system programs according to the design of the financial procedures that need to be computerized often turn out to be useful but are insufficient for the overall design of a new IFMIS and need to be complemented by other development and programming instruments.

These tools are attractive because the process "owners" can review their procedures before computerizing them and, over the long term, gain more ownership or participation in any future adjustments, with less dependence on technology providers. Furthermore, open-source software is a novelty that will probably become ever more important in coming years and might constitute an option offering a reasonable degree of security at a much lower cost.

Progress must be made in the development and application of indicators for the analysis and monitoring of IFMIS quality, and of public financial management in general. Existing analyses are based on PEFA evaluations complemented by specific IFMIS variables. In years to come, public administration system evaluations should include an additional parameter that measures a government's capacity to satisfy its society's growing demands for information.

In general, in spite of this positive evolution, the challenge remains to advance toward systems that are more committed to management and decision making at the sector level in the government.

To achieve this, financial execution must be linked with planning and monitoring of the physical execution of programs and projects using indicators and goals. Moreover, IFMIS administrative registers should support a results-based management model with timely and reliable information. Furthermore, the challenge remains to establish cost management based on the information generated by the IFMIS and charts of accounts designed for managerial use.

Therefore, IFMIS should not be viewed merely as computerized tools, but rather as tools that can fulfill a wider strategic role in modernizing public sector management. By sharing the benefits of generating and providing timely and reliable information with government managers and citizens, it is possible to provide a catalyst for reforms and to build the human capital necessary to sustain them. At present, modern business intelligence tools can facilitate this kind of work and enhance its effects. However, it is important to understand that, beyond technological advances, strong political leadership and consensus-building are needed to guarantee the effectiveness and sustainability of the processes of identifying, organizing, and providing information.

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CHAPTER 4

Where Are the Formal SMEs In Latin America and the Caribbean? The Role of Structural and Institutional Factors

Martin Chrisney and Joan Prats Oriol

- The low levels of productivity of the Latin American and Caribbean (LAC) region are related to the bias toward informal microenterprises and the absence of formal small and medium-sized enterprises (SMEs), which limits opportunities for good quality employment, competitive markets, and the fiscal capacity of the state.
- Institutional factors—such as the business climate, access to finance, and fiscal policies—determine the incentives for enterprises to invest, grow, and become formal. Such factors decisively influence the structure and, in particular, the emergence and growth of SMEs.
- Recent evaluations point to the limited impact of isolated institutional reforms and stress the importance of accounting for the synergies between complementary reforms, the differences between various types of SMEs, and the medium- and long-term effects of financial and enterprise development policies.

Despite the fact that, in recent years, the Latin American and Caribbean (LAC) region has managed to combine greater growth and macroeconomic stability with a significant reduction in poverty, the productivity gap between the region and more advanced regions has widened. This broadening gap is due, in part, to growth that is based on the accumulation of human and physical capital rather than on technological or managerial innovations (Daude and Fernández Arias, 2010). In fact, average productivity in the region is approximately half that in the United States, and its slow rate of progress is jeopardizing long-term growth and convergence with more developed regions. Therefore, in recent years, productivity growth has come to the fore as a central question of political economy.

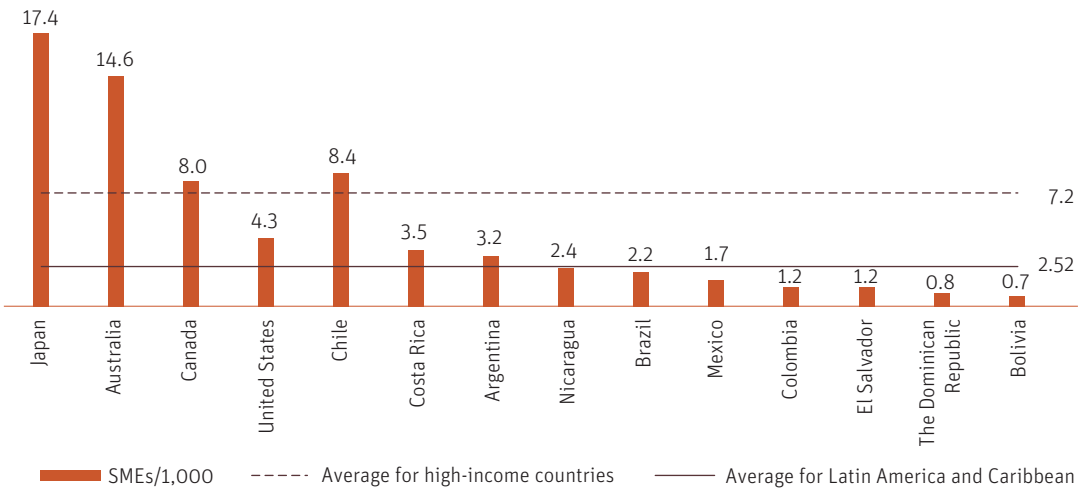
From a micro perspective, growth in productivity involves the shift of factors of production toward more industrious enterprises, reducing the dispersion of the marginal returns to capital and labor within specific sectors (Hsieh and Klenow, 2007). At the structural level, this process entails growing inter- and intra-sector productivity, because not only does output increase in each sector, but also, the most productive sectors become more important in the overall economy (McMillan and Rodrik, 2011). The thesis of this chapter is that institutions that promote competition and facilitate access to credit can prevent

inefficient companies from unfairly competing (primarily through tax evasion, but also by noncompliance with environmental, safety, and labor regulations), while encouraging more innovative and productive firms to gain a foothold in the economy. The absence of these institutions favors a business structure that is biased toward informal microenterprises and characterized by a general absence of formal small and medium-sized enterprises (SMEs).

In the LAC region, small, informal enterprises predominate, and there is a lack of both SMEs and large, formal corporations. The average number of SMEs registered per 1,000 inhabitants in the LAC region is almost one-third the average number in developed countries (Figure 4.1). This business structure is in line with the regional economy's low productivity levels. Microenterprises (those with less than 10 employees) are much less productive than SMEs and compare even less favorably to big companies. As Lora (2010a and 2010b) points out, firms with more than 100 employees use half of the capital and labor to generate the same value than do microenterprises, and such firms are three times more productive in Brazil, El Salvador, and Venezuela, and four times more productive in Mexico.

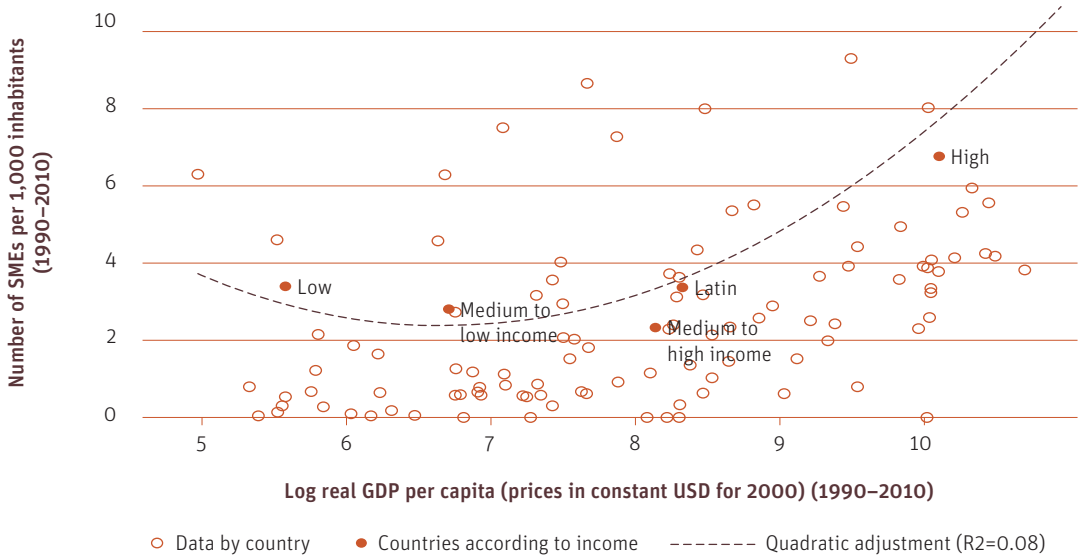
Growth in the number of SMEs forms part of a country's economic development process, in which the size of companies increases commensurate with growth in physical and managerial capital, and as

FIGURE 4.1: TOTAL NUMBER OF SMES IN SELECTED HIGH-INCOME COUNTRIES COMPARED TO THE TOTALS IN LATIN AMERICA AND THE CARIBBEAN



Source: Authors' elaboration, based on IFC data (2011).
Note: The average for high-income countries is based on a greater number of countries.

FIGURE 4.2: SMES AND DEVELOPMENT



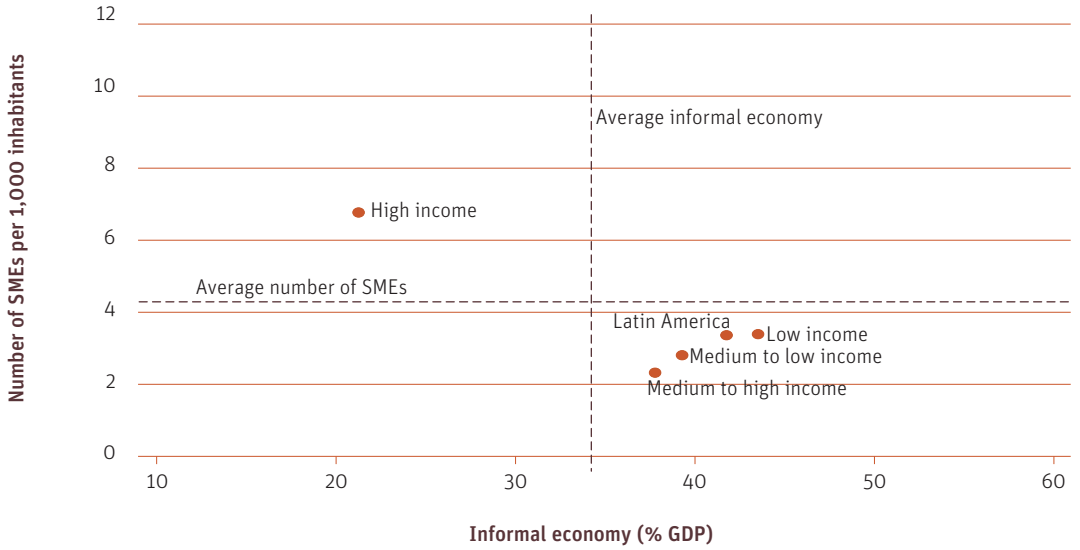
Source: Authors' elaboration, based on IFC data (2011) and the Penn World Tables.

economies of scale come into play (Lucas, 1978). As access to financial markets allows increased investment levels and more challenging entrepreneurial ventures, the existence of management capital is vital to take advantage of economic opportunities and to manage these larger-scale enterprises. From this point of view, the number of SMEs a country has affects its development process, as shown in the relationship with Gross Domestic Product (GDP) (see Figure 4.2).

Likewise, the process of creating and growing SMEs is associated with lower levels of informality (Figure 4.3). Lower informality has positive effects for the overall economy and on productivity, especially as a result of the following:

- Expanding the fiscal space and the capacity to invest in infrastructure, public goods (e.g., the judicial system or respect for property rights), and other policies that are fundamental to the economy's productivity (e.g., education and healthcare).
- Improving market operation, which encourages competitiveness through technological and organizational improvements instead of through tax evasion and noncompliance with regulations (Farrell, 2004). Such improvements increase the incentives to invest in training, technology, and

FIGURE 4.3: SMES AND INFORMALITY



Source: Authors' elaboration based on IFC data (2011); Schneider, Buehn, and Montenegro (2010); and the Penn World Tables.
Note: The dotted lines represent the simple averages for all countries in the sample.

organizational innovation, and enhance the chances that the most efficient firms will survive and grow, instead of favoring firms that evade taxes.[1]

Unfortunately, informality has become a persistent problem in LAC countries and occurs more often than in other less developed regions (Schneider, 2008).[2] Although this informality can sometimes serve as a solution for entrepreneurs and workers seeking to overcome unnecessary and dysfunctional administrative and employment barriers (Zenou, 2008; Bennet and Estrin, 2007), it puts limits on productivity growth and on SMEs that must compete with the informal market. In summary, this vicious cycle in the LAC region is the result of an economic structure that is biased toward microenterprises, informality, and low productivity.

[1] Surveys recently conducted by the Inter-American Development Bank (IDB) and the World Bank in the region's corporate sector show that more than 60 percent of firms in the LAC region consider competition from the informal economy as a serious obstacle to their business success.
[2] In recent years, informality in the LAC region has surpassed 40 percent of GDP (labor informality has surpassed 50 percent), reaching a level similar to Africa's and doubling the rate in Asia.

This chapter describes how institutional and structural factors can affect a company's size, as well as its incentives to formalize and invest. It then analyzes the empirical relationship between the number of SMEs and the quality of the business climate, taxation policy, and financial depth using cross-sectional data from more than 200 countries. Finally, it highlights various examples of institutional reform aimed at supporting SMEs, which were drawn mainly from the literature on impact evaluation.

SMES AND PRODUCTIVITY: AN ANALYTICAL FRAMEWORK

What explains the absence of SMEs in the LAC region? What induces firms to increase their levels of formal production and convert into SMEs? What are the main obstacles to the development of more formal SMEs? Entrepreneurs make business decisions about operating, expanding, and transforming a company based on a cost–benefit analysis. When the cost of financing investments and operating in the market are high, the benefits of evading regulatory burdens by operating in the informal sector grow. This makes being a smaller-sized company, which can escape detection by slipping under the tax radar, more attractive. However, this strategy also limits a firm's potential to exploit economies of scale or carry out more ambitious investment and innovation plans. The principal factors that influence a decision to formalize can be classified as institutional or structural.

- **Institutional** factors affect a company's transaction costs (e.g., business and worker registrations, and the procedures for paying taxes and obtaining licenses) and the relative prices of capital and labor (e.g., financing costs and fiscal costs).
- **Structural** factors relate to the sector structure of an economy, demography, and human capital, which in turn depends on productive endowments, as well as its stage of development, for which long-term policies are required.

Institutions Matter

Economic institutions play a fundamental role in market efficiency because they provide investors credibility and stability, and have a direct influence on the costs of entering into and operating in a market. Moreover, economic institutions can affect both a firm's fixed and variable costs. Institutions that influence fixed costs are those related to the business climate, whereas those that impact variable costs, mainly fiscal and financial institutions (policies), are related to the use of capital and labor.

- **The business climate** impacts the time, effort, and costs of the necessary procedures to start up or shut down a business, pay taxes, obtain a building or a health and safety permit, or hire and fire

workers. These are principally fixed costs that can decrease a firm's interest in becoming formal. As these costs are not proportionate to company size, they affect smaller enterprises more than larger ones. It is therefore not surprising that a high-cost business climate can encourage informality among microenterprises, instead of promoting an increase in dynamic formal SMEs.

- **Access to credit**, or the price of capital, directly affects an enterprise's operations and investment possibilities. In the LAC region, nearly 80 percent of formal SMEs do not have access to the financial markets (IFC, 2010). Lack of financing reduces investment in technology and productive improvements, as well as the incentives to formalize (Cãtao, Pagés, and Rosales, 2009). By limiting the growth of productive SMEs, lack of financing also enhances the survival chances for unproductive enterprises. Thus, any credit expansion must be accompanied by adequate supervision to avoid the risks associated with financial reversions, to which all SMEs are particularly vulnerable.
- **Fiscal policy**, the level of taxation, and the quality of fiscal supervision directly impact the incentives for companies to declare sales, profits, and employees. For example, while large corporations have access to tax breaks, SMEs are more directly affected by fiscal costs, which might motivate them to maintain a lower level of production—taking less advantage of economies of scale and scope—and realize only slight productivity growth.[3]

Although there are microenterprises that could not become formal, even if they wanted to, because of high transaction costs in the formal market (the *romantic view* of informality), many companies voluntarily use informality as a means of competing and surviving (the *opportunist view*).

Structural Factors

An economy's structural factors also influence the size distribution of businesses. Participation by SMEs is largely related to natural resources endowments and human capital, and to demographic and migration patterns. For example, if a country exploits raw materials such as hydrocarbons or metals, the efficient scale of business increases and there may be a tendency toward a dual structure where there are highly productive businesses in the mining sector, and lower productivity firms outside the dominant sector.

Likewise, a lack of entrepreneurship and low levels of physical capital reduce the optimum size of a company and lead, in the initial stages of development, to the emergence of numerous small, informal enterprises (Lucas, 1978; Rauch, 1991) with levels of productivity that are significantly below those found

[3] Another alternative for an enterprise to reduce costs is to make use of self-employed workers. This is particularly profitable for both the enterprise and the worker if the latter has access to the public healthcare and social security systems without having to pay employment contributions. Levy (2008) points out that this situation is prevalent in Mexico.

in large, formal businesses (Jones, 2008; Perry, 2008). Finally, demographic pressures and migration from the countryside to the city (Harris-Todaro, 1970) can also influence the business structure, as migrant workers tend to concentrate in service sectors that are characterized by low productivity and smaller enterprises (such as street vendors).[4]

SMES, PRODUCTIVITY, AND INSTITUTIONS: EMPIRICAL EVIDENCE[5]

Table 4.1 compares the levels of key variables, such as productivity, informality, the business climate, financing, and taxation, in the LAC region and the rest of the world. This data shows the region, on average, in a very unfavorable light, especially in variables related to business climate and financial depth.

- The numbers of procedures and days needed to start a business in the LAC region, to pay taxes, and to enforce contracts are among the highest in the world.
- Real interest rates in the region have been higher than the world average, and the levels of financial depth (measured as credit provided to the private sector as a percentage of GDP) are below average. Whereas the simple average of credit to the private sector in the region is 38.1 percent of GDP, in North America it is 173.2 percent and in Asia it is 62.2 percent.
- The broad relative availability of information stands out at an above-average level, principally due to the expansion of credit bureaus, especially in Argentina, Chile, Ecuador, Honduras, and Paraguay.
- With regard to the tax burden, the total estimated tax rate for a typical SME (including social security costs payable by the employer and taxes on profits) is comparable to the world average, although it is 11.3 percentage points above Asia and 4.9 percentage points above North America. However, tax collection reaches only 22.8 percent of GDP, compared with nearly 35 percent in the OECD. The difference can mainly be attributed to lower levels of personal income tax collection and social security contributions (Figure 4.4).

[4] The demographic structure also influences informality through the channel identified by Galiani and Weinschelbaum (2011): an increase in the number of workers in a household is associated with an increase in informality because some workers, whose household already enjoys medical and other coverage thanks to a formally employed worker, prefer to take more flexible employment.

[5] This section is based on cross-section data for the period 2000–10 for a sample of 210 countries (which includes 26 LAC countries).

TABLE 4.1: WHERE ARE WE IN TERMS OF PRODUCTIVITY AND SMES? 2000–10
(REGIONAL AVERAGE)

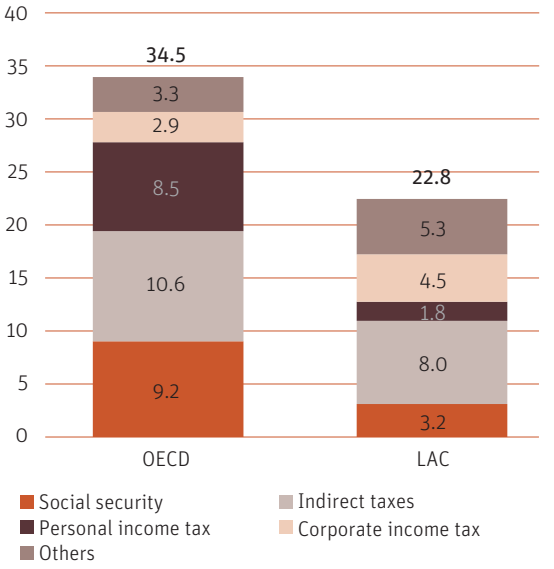
			BUSINESS CLIMATE							FINANCING AND TAXES			
			COMPANY REGISTRATION			PAYMENT OF TAXES		CONTRACT ENFORCEMENT		CREDIT			TAXES
Region	Per capita GDP (constant USD 2000)	Informal economy (% of GDP)	Business climate index	Number of procedures to start a business	Time to start a business (days)	Number of taxes and contributions paid by a business each year	Time to prepare and pay taxes (hours)	Number of procedures to enforce a contract	Time to enforce a contract (days)	Real interest rate (%)	Credit flow to private sector (% of GDP)	Credit information index (0 = low; 6 = high)	Total tax rate (percentage/ profit)
latin America and the Caribbean	4,267	41.9	102.4	10.8	82.6	37.2	466.7	38.2	751.9	9.8	38.1	4.0	49.8
World	8,594	34.6	92.3	8.9	43.9	31.7	304.1	38.2	617.1	8.1	48.4	2.7	50.4
North America	42,109	12.6	6.5	3.8	4.9	9.5	188.5	34.2	435.0	3.0	173.2	6.0	44.9
Europe and Central Asia	16,196	30.7	54.3	7.7	25.7	31.7	297.0	34.6	478.4	5.0	70.4	3.7	46.3
South Asia	949	34.6	117.0	8.1	35.6	31.2	295.9	43.5	1.049.6	6.0	30.2	1.9	40.5
Sub-Saharan Africa	1,044	42.1	137.7	10.3	55.6	37.8	326.1	39.4	661.3	16.1	19.2	1.3	70.9
East Asia and the Pacific	8,238	27.9	78.4	8.1	42.7	24.0	250.7	36.0	515.4	5.5	62.2	2.3	38.5

Source: See Appendix 4.1.

Table 4.2 demonstrates how these variables are correlated, although this does not necessarily imply a causal relationship.

- The number of SMEs for every 1,000 inhabitants is negatively correlated with informality and positively correlated with labor productivity. Economic informality and labor productivity display the strongest and most significant negative relationship: 0.7 at the world level and 0.5 in the LAC region.[6]
- The business climate variables behave with the expected sign and significance, which indicates that higher transaction costs are associated with lower productivity and fewer SMEs.
- Fiscal and financing costs are also strongly related to informality, productivity, and the number of SMEs. More limited and costly financing is associated with fewer SMEs, greater informality, and lower productivity. In turn, the total tax rate is positively associated with greater levels of informality, lower productivity, and fewer SMEs, although the latter correlation is insignificant.
- Structural factors also influence the number of SMEs. In particular, the level of human capital (measured as the average number of years spent in education) is significantly and positively associated with labor productivity and the number of SMEs per 1,000 inhabitants, and negatively associated with informality.

FIGURE 4.4: TAX REVENUE COLLECTION IN LAC AND OECD COUNTRIES
(PERCENTAGE OF GDP)



Source: OECD, IDB/CIAT.

[6] When the sample is limited to the region, the strong relationship between the level of economic informality and the importance of SMEs in the total number of businesses in the country stands out. This relationship does not occur in the sample taken at the global level and might indicate the significance of informality in blocking SMEs from assuming a greater weight in the region's economies.

TABLE 4.2: BASIC CORRELATIONS BETWEEN PRODUCTIVITY, SMES, AND INFORMALITY

INSTITUTIONAL AND STRUCTURAL FACTORS			
	REAL LABOR PRODUCTIVITY	SMES / 1,000 INHABITANTS	INFORMAL ECONOMY (% OF GDP)
Productivity, SMEs, and informality			
Labor productivity	1		
SME /1,000 inhabitants	0.25***	1	
Informal economy	–0.67***	–0.22**	1
SME/Total MSMEs (percentage)	–0.13	0.31***	0.16
Institutional variables			
Transaction costs			
Business climate index	–0.63***	–0.29***	0.51***
Number of procedures to start a business	–0.34*	–0.16*	0.34***
Time needed to start a business (days)	–0.17*	–0.12	0.18**
Minimum capital to start a business (% of income per inhabitant)	–0.47***	–0.19**	0.48***
Time needed to prepare and pay taxes (hours)	–0.28***	–0.13	0.29***
Fulfillment of contracts			
Number of procedures to enforce a contract	–0.25***	–0.06	0.25***
Time needed to enforce a contract (days)	–0.18**	–0.16*	0.16**
Credit Information Index (0=low to 6=high)	0.39***	0.26***	–0.28***
Factor costs			
Credit to private sector	0.64***	0.29***	–0.61***
Real interest rate	–0.20**	–0.01	0.25***
Real tax rate	–0.21***	–0.1	0.21***
Structural variables			
Average number of years in education	0.57**	0.24**	–0.42**
Exports of goods and services (% of GDP)	0.41**	0.01	–0.28**
Exports of minerals and metals (% of GDP)	–0.20***	–0.02	0.18**
Exports of food (% of GDP)	–0.36***	0.05	0.34***
Exports of oil (% of GDP)	0.19**	0.04	–0.04

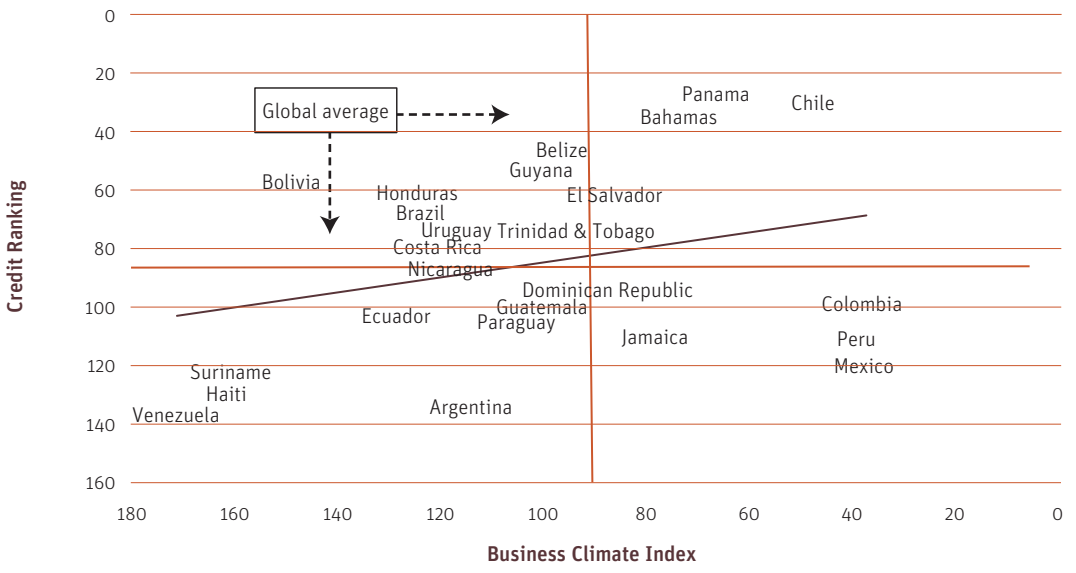
Source: See Appendix 4.1.
Note: * Significant at 90%. ** Significant at 95%. *** Significant at 99%.

TOWARD POLICIES THAT FAVOR PRODUCTIVE DEVELOPMENT OF SMES

Policies for productive development should address the institutional and structural factors that underlie the slower growth of SMEs in the LAC region. Such policies include those intended to reduce transaction costs, improve access to financing and markets, reduce fiscal pressure, and promote structural change. But, logically, not all countries require all the same policies, and not all policies are equally efficient at reducing informality and improving productivity. There is no single instrument that facilitates the emergence and growth of highly productive SMEs, but rather diverse instruments must be combined and adapted to the needs of each country. In turn, each policy should take into account the lessons learned from impact evaluations.

As a starting point, a high degree of heterogeneity is noticeable in the region with regard to the factors correlated with productivity, informality, and the number of SMEs. Figure 4.5 illustrates this variation in terms of the rankings of business climate and credit depth among different LAC countries. Whereas

FIGURE 4.5: THE LAC REGION IN THE POLICY RANKINGS



Source: Authors' elaboration based on World Bank data (*Doing Business* 2000–10).

some countries, such as Chile and Panama, rank high with regard to business climate and financial markets,[7] others, such as Haiti, Suriname, and Venezuela, are at the other end of the scale.[8]

Likewise, other countries, such as Mexico and Colombia, enjoy comparatively good business environments (Mexico is the top LAC country in the global business climate ranking, and Colombia is the fifth best country in terms of investor protection), but there are some significant obstacles in terms of access to finance.[9] In contrast, some countries lack economic institutions or efficient regulations governing market entry and exit, although they have more developed capital markets. This is true of Brazil, which has a developed credit market that is above the worldwide average, but suffers from excessive bureaucracy, requiring the most hours to prepare and pay taxes (2,600) and the highest number of procedures needed to start a business in the LAC region.

Lower Transaction Costs

Business climate reforms include a wide range of measures to improve markets, leading to better regulation and more efficient economic institutions. These measures include simplifying and improving the regulations concerning market entry and exit (e.g., company registers, bankruptcy laws, and investor protection); reducing the operating costs for businesses in their dealings with the State (e.g., worker registration, procedures for paying taxes, as well as building permits and health and safety permits); and providing greater judicial security for economic and financial transactions (e.g., property registers and mercantile laws and registries).

Given the inherent complexity of estimating the effects of changes in regulations and institutions (for which the use of experimental techniques is more complicated and microdata from various sources is required), there are few evaluations in this field. The existing studies are based on regression discontinuity analysis or on differences-in-differences models applied to market entry and exit. This means that better evaluations of reforms to the legal system are still pending.

The evaluations provide mixed results with respect to setting up and operating companies. Bruhn (2008) and Kaplan, Piedra, and Seira (2007) examine the simplification of company registers in Mexico

[7] According to *The Global Competitiveness Report 2010–2011* prepared by the World Economic Forum (2010), Chile ranks fifth in the world for banking soundness and ranks within the top 20 countries for availability and accessibility of financial services. Panama's positions are higher in all financial market-related indicators, and the country is considered the fourth best in the world in terms of access to financial services. Also, in comparison with other LAC countries, Panama requires the fewest number of procedures to start a business.

[8] For example, Venezuela occupies the lowest positions worldwide in various business climate indicators (170 in the number of procedures needed to start a business, 169 in the total number of taxes paid by an enterprise, and 139 in property rights) as well as in access to credit (176).

[9] According to the World Economic Forum indicators (World Economic Forum, 2010), Mexico ranks 105th out of the 139 countries in terms of access to financial services.

using the Rapid Business Start Up System (Sistema de Apertura Rápida de Empresas, SARE) and observe very limited effects on reducing informality but somewhat greater, albeit short-term, effects on the creation of new businesses, employment, and prices. Similarly, Ronconi and Colina (2011) evaluate the simplification of labor registration and the payment of social contributions in Argentina (known, respectively, as *My Simplification* and *Your Registration*) and also found a limited effect on formalizing existing workers, although there was a slightly greater impact on new worker registrations. In contrast, the Inter-American Development Bank (IDB) (2010) assesses the combination of simplifying procedures and reducing taxes in Brazil (through the project "Simples") and encounters significant effects on business formalization. Klapper and Love (2010) point out that, on a more macro level, in order to have noticeable effects on enterprise growth, so-called business climate reforms must reduce the number and cost of the procedures to register companies and obtain permits by almost half.

The results published by Giné and Love (2006) with regard to regulating governing market entry are more encouraging. These authors discovered that reform of the bankruptcy laws in Colombia reduced the cost of reorganizing viable enterprises (as a result of greater efficiency in the process) and diminished the number of profitable firms that had to be liquidated.

Regulatory improvement and procedural simplification call for coordination between different government levels and departments, and are subject to major complementarities with other institutional reforms. For example, simplifying corporate registers (and single windows in general) involves government at the local, regional, and national levels, as well as the other agencies required to facilitate digital signatures or property registers. Likewise, the efficiency of bankruptcy law reforms calls for complementary improvements in operating mercantile courts, training judges, registering movable and non-movable property guarantees, and preparing university students.

In summary, the effects of bureaucratic simplification measures on business growth (and especially on reducing informality) are limited, and reform strategies must be sufficiently integrated if they are to achieve significant impacts. Therefore, reducing transaction costs is a necessary condition to promote private sector growth—especially among SMEs—albeit insufficient on its own. Rather than concentrating on simplification measures (especially of a partial nature) or rankings, an overall view of the importance of economic institutions and of the complementarities inherent in institutional reform must be maintained.

Better Financial Markets

Limited access to finance constitutes a significant obstacle for SME growth. As they have less information at their disposal and fewer guarantees, SMEs often end up with short-term loans at high interest rates. The heterogeneity of SMEs also results in diverse financial problems. Medium-sized firms can access the banking system with relative ease to finance their current operations and replenish working capital,

although they may encounter problems in financing capital expansion, increasing the scale of operations, or investing in new technologies. In contrast, small enterprises often struggle to finance their day-to-day operations (e.g., commercial discounts, factoring, or leasing), which creates cash flow problems that can jeopardize a company's survival.

For a financial market to function well, there needs to be a basic institutional infrastructure to resolve information asymmetries that exist between the financial sector and the SMEs. This infrastructure includes credit bureaus (that establish a reputable credit history), regulatory frameworks, registries of secured transactions, and creditor protection. Bank credit risk evaluation mechanisms are also important. Although these often fail to discriminate between different-sized companies and do not consider the enormous heterogeneity of SMEs, promising new techniques exist based on psychometric tests (similar to those developed by human resources agencies and departments), which are useful to evaluate credit risk according to the abilities and ethics of the entrepreneurs themselves.[10]

Impact evaluations of financial development policies have concentrated on microcredit programs, whose beneficiaries are typically microenterprises and not SMEs. The principal policies aimed to improve credit access for SMEs are guarantee schemes, long-term loans with affordable interest rates, and policies to develop capital markets. Although fewer impact evaluations of these policies or capital market programs have been conducted, recent studies show some interesting results.

Aivazian, Booth, and Cleary (2003), and Ono, Sakai, and Uesugi (2008) have examined the guarantee systems and have found that, when put into place, restrictions on credit declined and investment levels in the beneficiary firms improved. Llisterri (2006) studied guarantee systems in eight LAC countries and observed a substantial impact due to public support, but also found that the systems fulfill a rather residual role in the financial system concentrating only on small companies. Furthermore, Meléndez and Eslava (2009), and Eslava, Maffioli, and Meléndez (2012) evaluated long-term credit policies with subsidized rates using quasi-experimental techniques in Brazil and Colombia, and found positive effects on growth in sales and productivity among the beneficiary companies. It is worth highlighting the importance of how these policies are designed in order to avoid benefiting less-productive enterprises and potentially displacing the more dynamic ones. To this end, policies should focus on market failures and specific sectors linked to strategic value chains that have the potential for significant productivity increases.

Finally, a key policy is the development of the capital markets to support SME growth and development. State financial and regulatory support can resolve coordination problems and drive development

[10] As part of its program Better Conditions for Productivity (MAP), which is financed jointly with the Spanish General Cooperation Fund (FGE), the IDB is financing experiments with this method alongside the Entrepreneurial Finance Lab in Argentina and Peru.

of these markets, for example by encouraging linkages among stock markets, fostering alternative markets for SMEs, or creating seed capital funds for "gazelle" SMEs. Capital markets not only add to a country's financial depth, but they also foster the development of new markets and products, such as insurance and derivatives, which might have strategic importance for areas like food security or overseas trade.

Friendlier Fiscal Policies

A country's taxation policy should take into account its effects on firms in general and on SMEs in particular. In this way, tax policy can achieve the greatest possible impact in terms of growth and productive employment. In the LAC region, tax revenue collection is lower than in other regions of the world and even lower than might be expected given the level of development in the majority of LAC economies.[11] Low tax collection, however, is not due to low tax rates. Rather, it is a reflection of tax bases limited by exemptions, convoluted tax payment processes, and high tax evasion. In effect, tax evasion is a subsidy for low-productivity enterprises (IDB, 2010) and has an influence on the quality of jobs created and on aggregate productivity.

One commonly used policy to encourage enterprises to formalize has been the use of special tax regimes for micro and small enterprises with simplified procedures and reduced company tax rates. In general, these special regimes collect only a small percentage of total tax revenue, which varies between 0.1 percent of total revenue in Bolivia and more than 6 percent in Brazil (Arias, 2009). Although these systems have increased the number of formal companies in some countries, they have also encouraged the phenomenon of "fiscal dwarfism" whereby entrepreneurs use diverse strategies to stay small and thus avoid paying more taxes (Chong, Guillén, and Ríos, 2009; McKenzie, 2009; Granda-Carvajal, 2011).[12] In general, fiscal policies, or others, that lack progressivity tend to produce these "border effects." For example, in South Korea, policies limited the availability of a number of governmental benefits to companies based on the number of employees, which meant that there was a marked bias toward companies concentrating at just below the 300-employee threshold.

Evaluations of fiscal policies tend to concentrate on their impact on growth, equity, or welfare; exceedingly rare are those studies that examine their effect on business productivity using microdata. One available study, by Galindo and Pombo (2011), finds that the impact of the corporate tax rate on the level of investment and total factor productivity is more significant for medium- and large-sized firms. Another, by Franklin, Carletti, and Márquez (2005), highlights the fact that the design and supervision of fiscal

[11] Argentina and Brazil are exceptions in this case.

[12] Similar effects are found in the employment laws that specifically apply only to firms of a certain size (Leonardi and Pica, 2006; Abidoye et al., 2008).

policies for SMEs is a relevant policy issue, which needs special attention given the differential abilities of these companies to either absorb or elude fiscal costs.

Structural Change

In contrast to Eastern and Southern Asia, in recent decades, the LAC region has been characterized by a pattern of negative structural change. In other words, the majority of new jobs have been generated in the least productive sectors (McMillan and Rodrik, 2011). Therefore, although the overall productivity of each sector has grown, the productivity of the countries and the region as a whole has fallen. In recent years, in response to this situation, industrial policies (or productive development policies) have become more prevalent as instruments to promote structural change by allocating factor inputs (especially labor) to more productive sectors. These policies include business development services, support for value chains and clusters, labor and business management training, export promotion, and incentives for research and development.

These productive development policies tend to concentrate on SMEs, given that microenterprises often lack sufficient scale to undertake productive improvements.[13] The preliminary evidence from the impact evaluations of these policies points to significant positive effects (see Appendix 4.1; McKenzie, 2009; López-Acevedo and Hong, 2010). For example, Bloom, Draca, and Van Reenen (2011) highlight the potential positive impact of entrepreneurial development consultancy services (in logistics, operations, quality control, marketing, finances, or strategy) designed to improve sales and productivity in a given sector. Likewise, Fujita, Krugman, and Venables (1999); Pietrobelli and Rabelloti (2004); and Rodríguez-Clare (2005) find positive effects in the externalities of knowledge and lessons learned, network effects in the value chain, and cluster programs. Finally, diverse studies show the positive impact of training at the company level (Bassanini, 2004), commercial promotion (Álvarez and Crespi, 2000; Lederman, Olarreaga, and Payton, 2006; Volpe, 2010), and the programs aimed at fostering research and development (Benavente and Crespi, 2003; González et al., 2010). One common characteristic of these results is that the positive effects on sales, exports, and productivity occur within a period of six to 10 years, and, in some cases, even longer periods. These positive effects are based on a combination of specific policies and programs, in which a mix of financial services with business development and training services is most favorable. Finally, to perform a cost–benefit analysis of these programs, it is important to implement methodologies to evaluate the quality of the institutions oriented to productive development and the costs of related services.

[13] In fact, the business development policies that have focused on microenterprises have often become confused with social policies. In this regard, these policies have successfully maintained employment, while failing to increase sales or productivity. Bonilla and Cansino (2011) have drawn this conclusion from the Seed Capital program of Chile's Technical Cooperation Service (Servicio de Cooperación Técnica, or SERCOTEC).

CONCLUSIONS AND FUTURE STEPS

The absence of productive SMEs in the LAC region is related theoretically and empirically to a combination of institutional and structural factors and—more specifically—to the region's business climate and fiscal and financial policies. These factors influence the incentives for entrepreneurs to formalize and expand their productive activities. Although no single factor can address the problems of informality and low productivity, in combination they can contribute to the solution, bearing in mind that these problems are more pressing in some countries than in others.

As a first step toward an integrated approach to tackling productivity issues, public policies must be focused more carefully. In other words, it is important to develop policies that take into account the target sector and firm size. In turn, as the structural factors are, to a large extent, specific to each economy, an ad hoc combination of policies will be needed in each country and region based on lessons learned in other countries or economies.

Policies should reflect the lessons that emerge from different impact evaluations (while not forgetting that many of these cannot be extrapolated or lack external validity), as well as from practical experience. Furthermore, although more and better evaluations—as well as policy monitoring—are required, progress is also needed in cost–benefit and cost-effectiveness analysis, which are key complementary inputs when making a choice between different policies.

A wide information gap must be bridged in order to design future policies to promote productive SMEs in the LAC region. Information on the barriers facing SMEs and their access to financing, or greater homogeneity in data gathering across countries, can contribute enormously to understanding the obstacles faced by these firms according to sector, size, and region. Gathering this information would represent an important step toward a more rigorous analysis of SMEs, and to the design of better policy recommendations.

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APPENDIX 4.1: INDICATORS AND SOURCES

GDP PER CAPITA (CONSTANT USD, 2000)

GDP per capita: Gross Domestic Product (GDP) divided by the population halfway through the year. GDP is the sum of the gross aggregate value of all producers in the economy, plus taxes on products, less any subsidies not included in the product values. It is calculated without making deductions for depreciation of manufactured assets, or of exhaustion or depletion of natural resources. The data is expressed in constant U.S. dollars.

Source: World Development Indicators (World Bank): *http://data.worldbank.org/*.

ANNUAL GROWTH OF GDP PER CAPITA (PERCENTAGE)

Annual growth rate of GDP per capita in constant local currency.

Source: World Development Indicators (World Bank): *http://data.worldbank.org/*.

POVERTY INDEX. THRESHOLD: USD2.00 PER DAY (PERCENTAGE OF THE POPULATION)

Percentage of the population that survives on less than USD2.00 per day, based on international prices for 2005. As a result of the revisions to exchange rates according to Purchasing Power Parity (PPP), poverty rates in individual countries cannot be compared with poverty rates from earlier editions.

Source: World Development Indicators (World Bank): *http://data.worldbank.org/*.

CREDIT TO PRIVATE SECTOR (PERCENTAGE OF GDP)

Internal credit to the private sector refers to the financial resources provided to the private sector, for example, via loans, the purchase of non-participating shares and commercial loans, and other accounts receivable that create a refund request. For some countries, these requests include the credit provided to the public sector.

Source: IMF: *http://www.imf.org/external/data.htm*.

FISCAL REVENUES (PERCENTAGE OF GDP)

Tax revenues refer to the mandatory transfers made to central government for public spending. Certain mandatory transfers, such as fines, sanctions, and many social security contributions, are excluded. Refunds and corrections to wrongly collected fiscal revenues are considered negative revenues.

Source: IMF: *http://www.imf.org/external/data.htm*.

REAL INTEREST RATE (PERCENTAGE)

Inflation-adjusted interest rate for loans, according to the GDP deflator.

Source: World Development Indicators (World Bank): *http://data.worldbank.org/*.

REAL LABOR PRODUCTIVITY

Real GDP per worker (Laspeyres index, internal absorption growth rate).

Source: Penn World Table: *http://pwt.econ.upenn.edu*.

MSME PER 1,000 INHABITANTS

Number of MSMEs participating in the economy per 1,000 inhabitants.

Source: IFC: *http://www.ifc.org/msmecountryindicators*.

SME PER 1,000 INHABITANTS

Number of SMEs participating in the economy per 1,000 inhabitants.

Source: IFC: *http://www.ifc.org/msmecountryindicators*.

NUMBER OF MICROENTERPRISES

Source: IFC: *http://www.ifc.org/msmecountryindicators*.

NUMBER OF SMEs

Source: IFC: *http://www.ifc.org/msmecountryindicators.*

TOTAL NUMBER OF MSMEs

Source: IFC: *http://www.ifc.org/msmecountryindicators.*

INFORMAL ECONOMY (PERCENTAGE OF GDP)

Source: Schneider, Buehn, and Montenegro (2010). Available at: *http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2010/10/14/000158349_20101014160704/Rendered/PDF/WPS5356.pdf.*

PERCENTAGE OF ENTERPRISES FORMALLY REGISTERED WHEN STARTING UP IN A COUNTRY

Source: Enterprise Surveys database: *http://www.enterprisesurveys.org*.

BUSINESS CLIMATE INDEX

Economies are classified by the ease with which business is conducted, from 1 (easiest) to 183 (most difficult). A good (low) score in the business easiness list means that the regulatory framework is favorable for business activities. This index corresponds to the average of percentage classifications in a country over 10 different headings, with the same weighting given to each one. The 2009 ranking is found in "Doing Business 2010: Reforming Through Difficult Times", which covers the period between June 2008 and May 2009.

Source: Doing Business database: *http://www.doingbusiness.org/data/*.

NUMBER OF PROCEDURES NECESSARY TO START A BUSINESS

This number reflects all the necessary procedures to be undergone before a commercial or industrial enterprise can operate legally, including all the interactions to obtain permits and licenses, as well as compliance with all the necessary registrations, checks, and notifications for startup. The data corresponds to limited companies with certain standard characteristics in order to facilitate comparisons between different economies.

Source: Doing Business database: *http://www.doingbusiness.org/data/*.

AVERAGE TIME NEEDED TO START A BUSINESS (DAYS)

The measurement captures the average period that the legal experts in business startups deem necessary to fulfill all the procedures required, with minimum monitoring by public agencies and without having to pay kickbacks. It is assumed that the minimum time required for each procedure is one day and that, although there are procedures that might be conducted simultaneously, these cannot be commenced on the same day. Time is calculated using calendar days.

Source: Doing Business database: *http://www.doingbusiness.org/data/*.

COST OF STARTING A BUSINESS (PERCENTAGE OF PER CAPITA INCOME)

The cost is recorded as a percentage of the economy's per capita income. It includes the official tariffs and fees paid for legal services or professional help if the law so requires. It also includes the tariffs for acquiring and legalizing the corporate ledgers, if required by law.

Source: Doing Business database: *http://www.doingbusiness.org/data/*.

NUMBER OF TAXES AND CONTRIBUTIONS PAID BY A COMPANY EACH YEAR

The tax payment indicator measures the total number of taxes and contributions paid, the frequency of payment, the frequency of tax return declarations, and the number of agencies intervening in a standardized case during the second year of corporate activity.

Source: Doing Business database: *http://www.doingbusiness.org/data/*.

TIME ALLOWED FOR PREPARING AND PAYING TAXES (HOURS)

This indicator records the number of hours (per year) that a medium-sized firm needs to prepare, present, and pay (or withhold) three principal kinds of tax: income tax, sales or value added tax (VAT), and employment taxes (e.g., as payroll taxes and social security contributions). In order to make the data cross-country compatible, various hypotheses about the firm and the taxes are used in a standard case study.

Source: Doing Business database: *http://www.doingbusiness.org/data/*.

TOTAL TAXATION RATE (PERCENTAGE OF PROFITS)

The total taxation rate measures the whole of obligatory taxes and contributions that a company has to pay in its second year of activity after accounting for the applicable deductions and tax breaks, expressed as a proportion of commercial profits. Withheld taxes are excluded (such as personal income tax) or those withheld by the firms to be thereafter remitted to the tax collection agency (e.g., sales tax, taxes on goods and services, and VAT). The total tax rate is designed to provide an exhaustive measurement of the tax burden that a company faces. The methodology for calculating the total tax rate largely coincides with the PricewaterhouseCoopers Total Tax Contribution Framework.

Source: Doing Business database: *http://www.doingbusiness.org/data/*.

NUMBER OF PROCEDURES REQUIRED TO ENFORCE A CONTRACT

This indicator measures the number of procedures required to resolve a commercial dispute through the pertinent courts of law. It includes the necessary steps to present the claim, the procedural phase, obtaining a verdict, and all the procedures needed to execute it. Those phases of the procedure that take place simultaneously, or are subsumed in other phases, do not count in the total number of procedures. The data is collected through a study of the civil code procedures and other court regulations, as well as through surveys conducted with local trial lawyers and judges.

Source: Doing Business database: *http://www.doingbusiness.org/data/exploretopics/enforcing-contracts*.

TIME NEEDED TO ENFORCE A CONTRACT (DAYS)

This indicator registers the average duration of a commercial dispute through the local tribunals. The time is recorded in calendar days, counting from the moment that the claimant presents the claim at the court until the time of settlement. This includes the number of days for the trial and the waiting times between the different phases. The data is gathered by examining the civil court procedures and other court regulations, as well as from surveys conducted with local trial lawyers and judges.

Source: Doing Business database: *http://www.doingbusiness.org/data/exploretopics/enforcing-contracts*.

CREDIT INFORMATION INDEX (0 = LOW TO 6 = HIGH)

This index measures the regulations that affect the scope, accessibility, and quality of available credit information, either through public or private credit registers. It ranges from 0 to 6, and the highest values represent greater availability of credit information to facilitate decision making on loans. A score of 0 indicates that the register is inoperative or that it includes less than 0.1 percent of the adult population. At the other end of the scale, a score of 6 indicates that the regulations guarantee the right of lenders to accede to the data held in the registers, and that the following information can be obtained as part of a report: (1) both positive and negative credit information, (2) data regarding individuals and companies, (3) data on retailers and public service providers, (4) more than two years of historical data, and (5) data regarding loans beneath 1 percent of per capita income.

Source: Doing Business database: *http://www.doingbusiness.org/data/exploretopics/enforcing-contracts*.

CHAPTER 5

Fiscal Incentives for Business Innovation

Gustavo Crespi

- In the Latin American and Caribbean (LAC) region, fiscal incentives have effectively increased investment in intangible assets by enterprises and leveraged private resources for these investments. The impact on the financial results of enterprises appears to be positive after sufficient time has passed since the approval of the aid.
- The various financing mechanisms have different effects on the diverse beneficiary groups, which must be considered when designing future programs to enhance their effectiveness and minimize moral hazard.
- Further analysis is needed before a balanced judgment can be made about the efficiency and the social consequences of these interventions from the point of view of the cost-benefit analysis.

Since the beginning of the 1990s, public programs designed to foster innovation and technological modernization at the business level have grown systematically in Latin American and Caribbean (LAC) countries. The justification for these programs lies in the market's incapacity to provide the necessary incentives to reach an acceptable level of private investment in innovation activities.[1] Because of this incapacity, LAC enterprises have failed to adopt the modern practices and technologies that would have enabled them to improve their productivity and competitiveness.

In this context, various LAC countries have introduced fiscal incentive programs to stimulate innovation activities and strengthen the connections between firms and other actors in the national innovation system (NIS).[2] The first program of this type got underway in Chile in 1991 and, since then, programs have spread throughout the region. Currently, 70 percent of LAC countries have implemented some kind of fiscal stimulus program aimed at encouraging private investment in innovation.

[1] Investment in innovation activities includes tangible assets (e.g., machines, equipment, and computer hardware) and intangible assets (e.g., research and development, design, and computer programing). This chapter focuses on intangible assets.

[2] Metcalfe (1995) defines a national system of innovation as "that set of distinct institutions which jointly and individually contributes to the development and diffusion of new technologies and which provides the framework within which governments form and implement policies to influence the innovation process. As such, it is a system of interconnected institutions to create, store, and transfer the knowledge, skills, and artifacts that define new technologies. The element of nationality follows not only from the domain of technology policy but from elements of shared language and culture which bind the system together, and from the national focus of other policies, laws, and regulations which condition the innovative environment."

Along with the accumulated experience gained by implementing these programs, there has been an increase in information and methodological lessons learned about the effectiveness of the programs in mitigating the diverse market failures that hamper innovation and productivity in the region. This chapter presents a qualitative meta-analysis of these programs and their respective impact evaluations in order to reach a final verdict on the lessons learned. Further, the chapter presents specific recommendations about public policy design to maximize the impact of policies on business investment and productivity levels.

The first part of the chapter discusses the regional performance in innovation over the last 20 years. This is followed by different arguments that justify public policies regarding business innovation. The third section presents the diverse stimulus policies implemented in the region and describes their principal characteristics. The fourth section provides a comparative analysis of recent evaluations. The final section summarizes the important themes pertaining to the design of future innovation policies.

THE REGIONAL INNOVATION LANDSCAPE

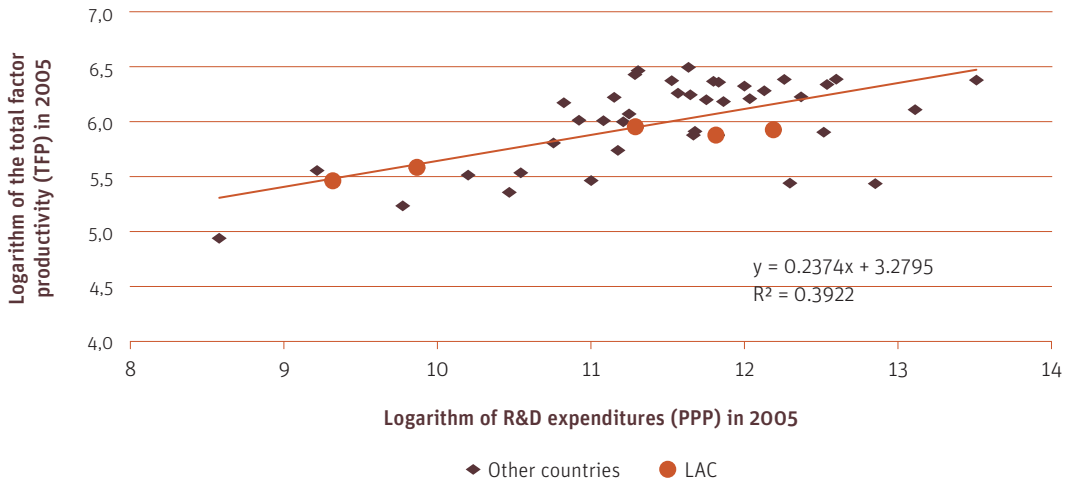
As discussed in Chapter 4, the LAC region has performed very poorly in terms of productivity in comparison with other countries, both developed and developing. This explains the region's modest economic growth over the last 30 years, and the persistence of its relative backwardness, even over the last five years during unusually favorable international conditions.

Innovation, defined in broad terms as the introduction of new products, processes, or organizational methods in businesses, is considered to be a primary driver of productivity growth.[3] Entrepreneurs innovate when, motivated by their expectations of higher earnings, they seek better (i.e., more efficient) productive and management processes that reduce costs and/or improve the quality of production. They also innovate when, having identified an unsatisfied consumer need, they design and launch new products that improve on the quality of existing products.

There is a positive and statistically significant correlation between investment in intangible assets (e.g., research and development, or R&D) and productivity in a wide-ranging sample of countries (Figure 5.1). The strength of this correlation suggests such investment has high social returns. In effect, nearly 40 percent of the variations in productivity among the sample countries can be explained by variations in levels of investment in R&D. However, LAC businesses exhibit seemingly suboptimal levels of investment in innovation (both in tangible and intangible assets, see Figure 5.2). In particular, the average

[3] The OECD and Eurostat (2005) define innovation as "new products, productive processes, and organic changes that create wealth or social welfare."

FIGURE 5.1: R&D AND PRODUCTIVITY



Source: IDB (2010a).

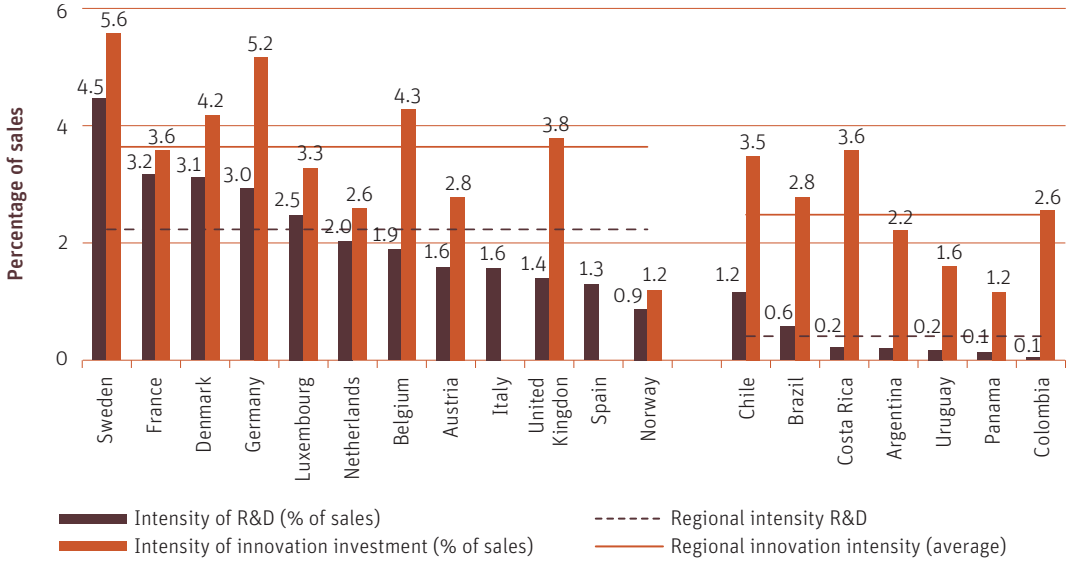
rates of investment in innovation are markedly lower than in the Organisation for Economic Co-operation and Development (OECD) countries, with the investment gap particularly pronounced in intangible assets or, in other words, in R&D.[4]

Not only is the general level of investment in the LAC region low, it is also notable that the public sector directly finances a major part (nearly two-thirds) of this investment (Figure 5.3). This is in stark contrast with the OECD and other rapidly growing economies, where nearly two-thirds of innovation investment comes from private sources. In other words, the region displays clear shortcomings in investment in innovation, especially regarding the private sector's contribution.

This scant interest to invest in innovation is even more astonishing considering that different studies have pointed out the high returns, both private and social, from such investment (Lederman and Maloney, 2003; Crespi and Zúñiga, 2011). This poor performance in terms of the effort that firms make to innovate is attributable to a combination of market failures and institutional management.

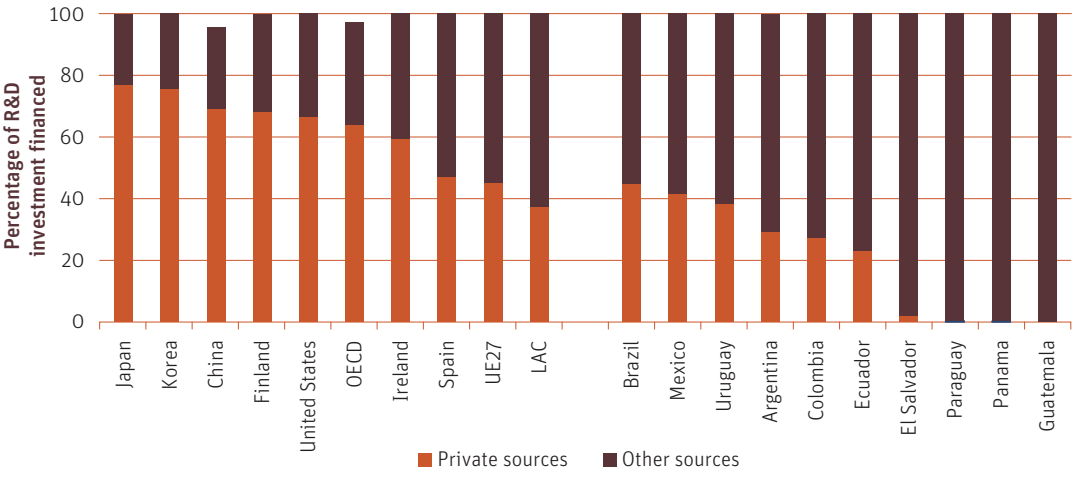
[4] Despite the fact that investments in R&D are normally oriented to introducing innovations with a high novelty value—in other words, innovations that surpass the technological frontier—there is consensus in the literature that a minimum level of R&D is also necessary to create sufficient capacities to seek, adopt, and adapt already existing technologies to local conditions (Griffith, Redding, and Van Reenen, 2004). The disconcerting aspect is that not even this minimum level has been reached in the LAC region.

FIGURE 5.2: TOTAL INVESTMENT IN INNOVATION AND INVESTMENT IN R&D



Source: IDB (2010a).

FIGURE 5.3: SOURCES OF FINANCING FOR BUSINESS INVESTMENT IN INNOVATION



Source: IDB (2010b).

THE RAISON D'ÊTRE OF INNOVATION POLICY

The fundamental premise behind innovation policy is that government intervention is called for when the production benefits and/or improvements in information exchange are lower for the private sector than for society in general. The existing literature regarding the economy of innovation indicates that, for various reasons, this is in fact the case.

Knowledge as a Public Good

Ever since the seminal works by Nelson (1959) and Arrow (1962), knowledge has been considered a non-excludable and non-rival good. When innovators cannot take advantage of all the benefits associated with knowledge creation, a gap arises between social and private returns from related investments and, therefore, the investment in knowledge generation is less than desired. This applies not only to the level of investment in innovation, but also to its orientation. In other words, the argument becomes even more compelling in the case of scientific knowledge than in technological knowledge, given that the latter is more applied, predictable, and linked to a firm's specific assets.[5, 6]

The Problem of Asymmetric Information

The economics of information literature (Stiglitz and Weiss, 1981) indicates that asymmetric information in market transactions (owing to problems of adverse selection and moral hazard) can influence business innovation in two ways. First, innovation projects have unique characteristics that exacerbate the typical problems of asymmetric information that hinder the financing of all investments (Hall and Lener, 2010). In the first place, innovation projects are riskier than physical projects. In the second place, innovators are reluctant to share information about their projects with potential investors to avoid revealing any confidential knowledge. This further magnifies the problem of asymmetric information. Lastly, it is

[5] It is unlikely that projects with a significant basic research component can produce commercially applicable results over the short term. Although this might discourage private investors, the projects might continue to enjoy a high degree of social return as a result of the skills and knowledge generated during their development.

[6] It is also easier to protect technological knowledge by using intellectual property rights. However, this does not imply that an enterprise's investment in generating technological knowledge will be necessarily optimum from a social point of view. There are also cases of incomplete appropriability regarding this kind of knowledge given that the coverage offered by intellectual property rights is always limited. Moreover, there are additional reasons to argue that intellectual property rights are, at best, a second-rate solution. In effect, granting these rights implies a problem of static inefficiency in resource allocation by creating temporary monopolies and, at the same time, a kind of dynamic inefficiency caused by the delay in disseminating the protected technology. It is usually expected that these two distortions—the static and the dynamic—are more than offset by the dynamic earnings that arise from a greater stimulus of innovation. However, there are alternative mechanisms that might have lower social costs in terms of distortions to competition and diffusion, such as collaborative innovation schemes or consortia (Álvarez et al., 2010).

difficult to use intangible assets as collateral. In summary, a gap is created between the normal opportunity cost faced by private sector innovators and the minimum capital cost that they are willing to pay to finance the innovations. The result is that, in the end, some potentially profitable innovations fall by the wayside.

Second, private actors—both producers and users—are now fully aware of the possibilities that a new technology offers. Normally, the one providing the technology has more information about its potential than the person about to acquire it. Given the problems of adverse selection and moral hazard associated with the asymmetric information that affects technology transactions, their distribution ends up being slower than it might otherwise have been. This concurs with two findings of remarkable empirical robustness: (i) there are persistent differences between countries regarding technological performance, meaning that keeping up to date is far from being the automatic process that the idea of knowledge as a public global good might suggest (Fagerberg and Verspagen, 2002), and (ii) the process of technological dissemination, even within industries operating in a concentrated environment, is very slow and produces persistent differences with regard to firms' productive performance (Disney, Haskel, and Heden, 2003).

Coordination and Institutional Failures

The most recent literature on innovation systems emphasizes that the knowledge that underpins any innovation always has critical tacit components, making it very difficult for these systems to emerge without the necessary feedback and interaction among various actors (Lundvall, 1992). Although many interactions occur as a result of market transactions (e.g., when a firm purchases new machinery and receives technical assistance from the supplier for its setup), different institutions govern other interactions, potentially leading to coordination problems (Soete, Verspagen, and Ter Weel, 2010). Difficulties in coordination can occur, for example, in the development of software applications for small- and medium-sized enterprises (SMEs), which usually requires close interaction between the developer and the user because of the limited absorption capacity of the user (Cohen and Levinthal, 1989).[7] In a scenario in which scale is limited and clients are highly heterogeneous, transaction costs can end up hampering the emergence of a software service market oriented toward SMEs. By establishing user groups to coordinate demand and regulating minimum product standards, it may be possible to overcome this limitation. In more general terms, putting a new technology into practice in any productive environment will always require regulatory changes and the coordination of joint investment in indispensable complementary assets, such as human capital, the distribution chain, regulations, and so on (Bresnahan and Trajtenber, 1995; Aghion, David, and Foray, 2009).

[7] Absorption capacity refers to the likelihood that, before exploiting new knowledge, users must jointly invest in human capital or seek direct help from the originator (Steinmueller, 2010).

Insofar as institutions govern the coordination of human interactions, the latest literature on innovation also emphasizes good governance and institutional reform. For example, the literature favors the innovation of institutional designs that promote public–private interactions and that connect the different actors participating in the innovation process (e.g., universities, public research agencies, producers and users of new technologies, and consumers). It is possible to facilitate better coordination by defining new roles for existing institutions (e.g., allowing universities to claim intellectual property rights over the research they conduct or regulating new contract models that support the emergence of a risk capital industry) or by creating organizations to regulate interactions between actors (e.g., by creating university technology transfer offices, business development centers, and public–private technology development alliances) (Steinmueller, 2010). These arrangements can lead to greater equilibrium for several reasons: the innovation costs are not wasted on duplicate efforts that lead to identical results, diverse externalities become internalized, and the coordinated joint investments may turn out to be complementary.[8]

POLICIES TO STIMULATE BUSINESS INNOVATION IN THE LAC REGION

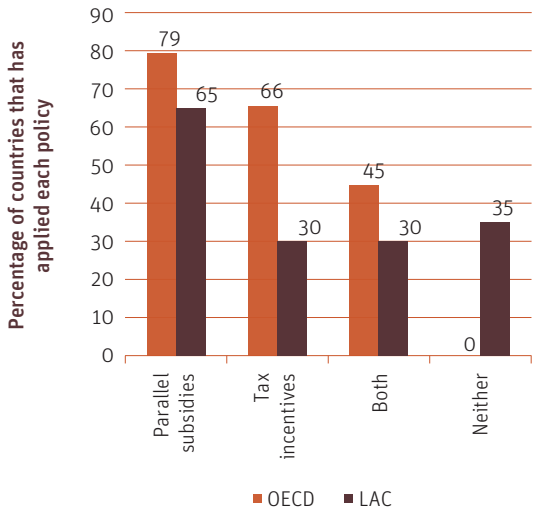
Given the numerous failures that affect business decision making about investing in intangible assets, there are various policy approaches that LAC countries have put into practice to try and solve the problem of underinvestment (David, Hall, and Toole, 2000). First, the supply-side approach, which predominated in the region until the mid-1980s, encourages direct production of knowledge and complementary assets—in particular, human capital and information—by public institutions (e.g., laboratories, research institutes, and universities). Typical instruments used in this approach are scientific research funds, support for technological infrastructure (e.g., technological development centers), development of human capital, and technology transfer programs. According to the international evidence, supply-side approaches are particularly important during the early stages of a system's development.

Second, a demand-side approach emphasizes developing of innovation capacities and adopting new technologies by enterprises. The dominant instruments used in this approach are fiscal incentives that stimulate demand for business innovation. These incentives are normally implemented through technological development funds. This kind of approach has been spreading throughout the LAC region since the mid-1980s and includes not only incentives to invest in intangible assets, but also to adopt new technologies.

[8] The inherent risk in this method is that encouraging firms to coordinate their investments in innovation during the first stage of a project (i.e., the R&D stage) creates the conditions for the firms to collude in the commercialization stage. To avoid collusion, it is necessary to establish rules that oblige the firms to undergo competition during the second stage (e.g., prototype design). For more on this matter, see Martin and Scott (2000), among others.

Third, a systemic approach seeks to generate incentives and reforms that facilitate the coordination of supply with demand and to reduce the transaction costs that hinder better coordination. The programs used in this approach stimulate collaboration among universities, strengthen clusters and value chains, and support technology development alliances and entrepreneurship. One characteristic of this recent approach, which began to spread throughout the region at the end of the 1990s, is the importance that it places on the institutional framework and on strengthening the organizations responsible for designing and implementing innovation policies. Therefore, specialized institutions, such as innovation agencies, innovation councils, and even ministries that specialize in such public policies, are starting to emerge in various countries, giving rise to a varied platform of institutional models (IDB, 2010b).

FIGURE 5.4: FISCAL INCENTIVES FOR BUSINESS INNOVATION

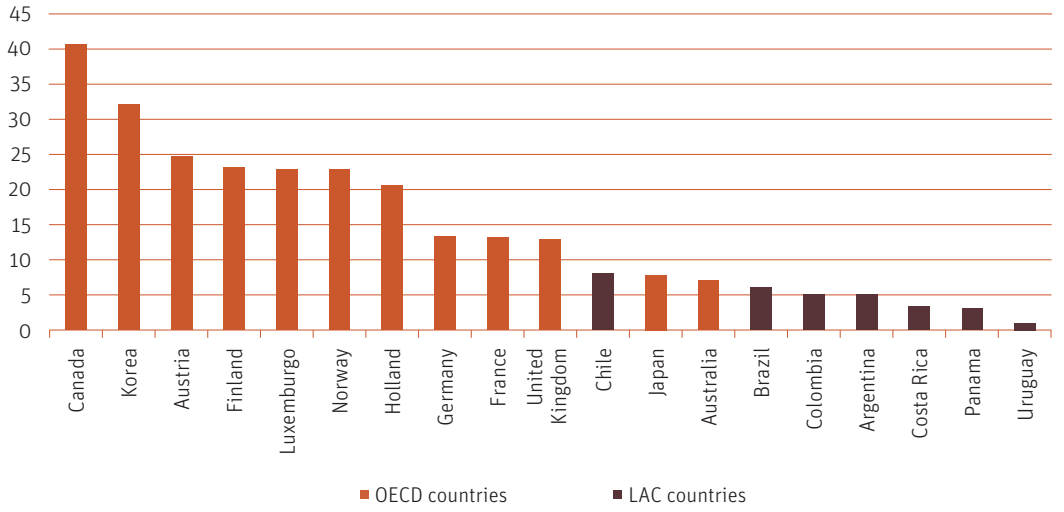


Sources: Author's elaboration, based on UNESCO, IDB (undated), and OECD databases (2010, Table 2.6).

The focus of this chapter is the role that fiscal incentives play in the LAC region as a mechanism to resolve the market failures that hinder firms from investing in innovation and adopting new technologies. In particular, the chapter focuses on direct subsidies (usually partial subsidies or matching grants) and tax incentives. Although there are other kinds of incentive schemes (e.g., public technology acquisition policies, technology extension policies, and programs to encourage entrepreneurs), the empirical evidence and the accumulated lessons learned about the impact of such incentives is much less comprehensive (Steinmueller, 2010; IDB, 2010b).

Figure 5.4 compares the degree of penetration of fiscal incentives for innovation in LAC countries with the degree in OECD member countries. Only 65 percent of LAC countries have created partial subsidy mechanisms, and only 30 percent use tax incentives. Moreover, only 30 percent of the countries have both systems and 35 percent have neither. Meanwhile, nearly 80 percent of OECD countries have established a partial subsidy system, 66 percent have introduced tax incentives, 45 percent have both, and all of them have at least one type of incentive. However, the fact that some countries have these instruments does not necessarily imply that their use is widespread. Figure 5.5 shows the penetration of these programs in terms of the number of enterprises that take advantage of them. It is clear

FIGURE 5.5: FIRMS THAT RECEIVED PUBLIC SUPPORT TO FINANCE INNOVATION ACTIVITIES
(AS A PERCENTAGE OF ALL FIRMS)



Source: IDB (2010a).

that penetration rates in LAC countries are lower than in the OECD countries. It is not, however, only a matter of these rates being low; the volume of public resources mobilized is also particularly low. For example, Chile, a country with one of the more highly developed fiscal incentive systems, only spends about 0.08 percent of gross domestic product (GDP) on fiscal incentives (Maggi, Rivas, and Sierra, 2012). In Argentina, the budget for entrepreneurial innovation programs is less than 0.02 percent of GDP (Angelelli, 2011).

Direct Subsidies

Direct subsidies provide immediate support for business innovation and are awarded to businesses by a public sector agency once an innovation or technology adoption project has been formulated, evaluated, and approved. Direct subsidies reduce a firm's marginal capital costs and can increase the marginal rate of private returns on innovation investment by, for example, encouraging collaboration with other actors that can supply complementary assets (e.g., human capital and information) required to guarantee a project's success. Given that direct subsidies are specific to a project, in theory, they allow public agencies to select only those projects that are expected to have a high social return.

The expected impact of a subsidy is summarized in Figure 5.6, which shows a firm's demand for innovation investment and a supply curve for the funds available to finance this investment. The flat part of the fund supply curve represents the availability of the company's internal funds to finance an investment (e.g., cash flow), which would have a cost equal to the opportunity cost. This figure makes clear that, if the firm had sufficient funds, it would finance the "optimum" investment indicated in the figure, which would turn out to be far superior to what was effectively carried out. This gap is the result of the liquidity restrictions caused by the previously mentioned problem of asymmetric information. In other words, when faced with a lack of internal funds, the business must seek external financing, at a substantially greater cost, which means that potentially profitable projects are not initiated. In this case, a subsidy, as can be seen in the figure, induces a displacement to the right of the fund supply curve, thereby enabling the firm to approach its optimum (private) investment level.[9]

The main dangers associated with direct subsidies are problems deriving from the moral hazard that can result from the asymmetry of information between the public agency and the beneficiaries. In practical terms, this implies that firms without liquidity restrictions and/or appropriability problems, which could therefore finance their own innovation projects, might end up being financed with zero additionality. Furthermore, while the public agency seeks to induce firms to reach the socially optimum size of innovation efforts, private entities may simply be trying to maximize the size of the innovation project, given that size is linked to the amount of the subsidy. However, the problem of moral hazard might be mitigated by a design that includes the following key attributes:

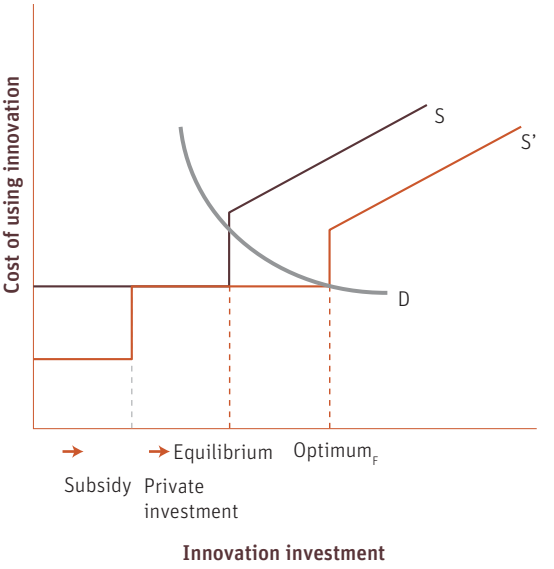
- **A direct partial subsidy scheme** (or matching grants) with maximum limits and a list of admissible costs. In this scheme, to achieve greater alignment between the goals of the firm and the public agency, and to mitigate moral hazard, the subsidy never covers the entire cost of the project.[10] Therefore, if the beneficiary wants to increase the size of the innovation project, then he or she will have to shoulder the higher costs. Furthermore, the existence of private verifiable co-financing will encourage the entrepreneur to seek to invest in projects with a certain degree of profitability. For co-financing to be verifiable, it is implemented by ex-post disbursement of the admissible approved costs.

[9] The interpretation gets even more complicated in the presence of externalities, which also generate underinvestment from the social point of view (in terms of Figure 5.6, it implies the existence of a social demand curve more to the right).

[10] In spite of the fact that there are significant variations in the types of expenditures that fulfill the requirements to receive a subsidy, the typical program of partial subsidies covers the variable costs of research (e.g., researchers' salaries, research inputs, and tertiary R&D costs). However, in some cases, a fraction of the fixed costs of laboratory and testing equipment is also included. Some programs also include the costs relating to the acquisition of intellectual property rights, such as the costs of purchasing licenses or patents, and applications for brand registration.

- **A competitive call for proposals process.** A competitive process allows the public agency to identify the best proposals and allocate resources based on evaluation scores normally set by external auditors or peer reviewers. To enhance transparency and diminish the risk of rent seeking, the adjudicating committees are usually made up of government representatives and private, academic, and civil society organizations. The technical evaluation is normally accompanied by a social cost–benefit analysis.

FIGURE 5.6: THE EVALUATION OF SCIENCE, TECHNOLOGY, AND INNOVATION PROGRAMS



Source: Authors' elaboration.

One interesting feature of this shared costs scheme is that the public agencies can adjust the co-financing amount according to project or beneficiary characteristics. For example, the amount may be increased when the project entails the participation of more than one beneficiary—given the greater chance of externalities being generated—or when the project beneficiary is a small enterprise—given the greater intensity of market failures faced by SMEs.[11] Alternatively, subsidies might be aimed at the fixed capital component of an innovation project (e.g., an R&D laboratory or a CAD system) to install these capacities and diminish the costs of future innovation projects.

In spite of their potential, direct subsidies also have drawbacks. The main one is that successful implementation requires significant institutional capacities and, when these are lacking, the efficiency of the operation as a whole diminishes drastically. These capacities include a predictable institutional framework (that allows for policy experimentation, monitoring, and evaluation) and a critical mass of human capital in the agency responsible for implementation and in its support system (e.g., evaluators and peer reviewers).[12] Moreover, subsidy payment administration must be able to be conducted in accordance with the complex regulations that govern all disbursements of public funds (Steinmueller, 2010). For all

[11] Co-financing usually varies between 20 and 70 percent of the total costs of the project.

[12] When these capacities are lacking, the result might be high administration costs, which normally occurs during the early stages of policy experimentation.

these reasons, the implementation of direct subsidies is usually conducted through new, specialized institutions (e.g., innovation agencies).

A second problem is that, given that subsidies are usually paid ex-post, they are inadequate for entrepreneurial innovators with severe liquidity restrictions. Some designs attempt to correct this problem by making partial advances of resources to new enterprises, but even in these cases the cash transfers must be backed by guarantees. A third problem relates to the call for proposals process. Unless several calls are made over the course of the year, a firm might have to wait several months before being able to even ask for funds. This could make the scheme less attractive, especially in sectors where market leadership is a key asset of competitiveness, or in sectors in which there are attractive technological opportunities.[13]

Finally, a fourth problem is that, when the direct subsidy schemes are implemented in a context of low relative development, their success depends on the firms' capacities to identify an innovation opportunity and to codify it in a coherent project proposal. This kind of capacity on the demand side of the scheme is not something that can be taken for granted. Some of the programs in the LAC region have attempted to mitigate this problem by providing small amounts of aid for project formulation or by creating two-stage public calls for proposals—a call to present the conceptual notes and a second one for the proposal.[14]

The direct subsidy programs in LAC have evolved over time in line with the transition in innovation policy in the region. First, they have moved slowly toward a more selective objective-based approach, centered on specific sectors or technologies. This evolution seeks to avoid distribution of the limited resources available to promote innovation and increase the chances of reaching a critical volume of projects that make an impact on the targeted sectors or technologies. Programs are also oriented toward developing more made-to-measure interventions based on the lessons learned about the principal market failures and other limitations faced by firms wishing to innovate. For example, there is noticeable growth among those schemes that promote collaboration or cooperation between actors, whenever there is the chance that externalities can be generated.

[13] To mitigate this limitation, some agencies also function using an "open window" system, wherein firms can present project proposals at any time. The proposals are evaluated from the technical point of view and from the cost–benefit perspective, and if they reach a minimum points score, they are sent to the adjudication committee for approval. The main difference between this method and the calls for proposals system is that competition is weakened because the firms that send in their proposals earliest stand the best chance of obtaining financing.

[14] In fact, a healthy tendency has been observed in some countries toward segmenting the aid into various phases. Although this increases transaction costs, segmentation allows disbursements to be "tied" to achieving success at the different stages of the project (beginning with the conceptual note, followed by research and then more applied development, prototype production, intellectual rights protection, and so on).

Second, another interesting evolution has to do with the coexistence of grants with subsidized credit lines or conditional loans. At the beginning of the 1990s, different countries experimented with these kinds of loans, which, following the traditional Israeli model (Trajtenberg, 2005), could be partially or totally forgiven according to the success or failure of the project, the nature of the beneficiary, and the project's technical risk level. However, the emergence of direct subsidy programs significantly curtailed firms' interests in this kind of conditional loan, which has led to their elimination.

Recently, subsidized loans have reemerged in certain countries, but they are focused more on financing the adoption of innovative technologies in businesses, above all for machines and equipment. However, the justification for these loans is different from that which underpins support for investment in intangible assets such as R&D or design, and mainly resides in the potential positive externalities that the incorporation of new technology might generate for the rest of the sector or the wider economy. It is about solving a problem of asymmetric information with regard to the new technology and, by doing so, accelerating its diffusion. Once the innovator that is adopting the technology has achieved the demonstration effect, the subsidy to finance additional units of the same technology must be discontinued. Therefore, implementation of this scheme calls for the agency responsible to define precisely what should, and should not, be considered an innovative technology. In spite of the challenges of implementation, one positive feature of subsidized loans is that, insofar as the interest rate subsidy is small and does not push the cost of capital below the firm's opportunity cost, it is a powerful instrument for distinguishing between potential innovators (that select themselves due to their genuine liquidity constraints problems) and rent-seekers.

Tax Incentives: An Alternative to Subsidies?

Tax incentives, like direct subsidies, aim to reduce the costs to businesses of investing in innovations. However, in contrast to direct subsidies, in their most conventional form, tax incentives are based on the entirety of business innovation activities, allowing firms to gain support for their entire project portfolio instead of having to submit a separate proposal for each project. Obviously, this drastically diminishes a firm's compliance costs, as well as the innovation agency's administration costs, but it also creates a series of problems.

Tax incentives are varied and include tax credits, tax deductions, and the accelerated depreciation of innovation-related investments. Tax credits permit the amount of tax payable to be directly reduced, whereas deductions and accelerated depreciation raise the tax threshold for taxable corporate earnings. Therefore, the principal difference between the two kinds of mechanisms is that the former directly reduces the tax burden, whereas the latter reduce the tax burden on the corresponding proportion of the current tax rate. In developed countries, tax incentives are normally applied to corporate earnings. However, in LAC countries, indirect taxes—such as value added tax (VAT) or import

tariffs—are also included in the deductions given the greater relative importance of these taxes in relation to income tax.

As in the case of direct subsidies, certain aspects of policy design must be considered before tax incentives are implemented.

- **The target group.** Tax incentives can be made available to all enterprises, or a more generous incentive can be provided to SMEs or specific sectors.
- **The regulatory definition of innovation activities.** Countries usually apply variations of the international standards set out in the *Frascati Manual* (OECD, 2002) or in the *Oslo Manual* (OECD and Eurostat, 2005).
- **The definition of the activities eligible for tax incentives.** For example, tax incentives may be available for R&D staff salaries, research input costs, or capital costs incurred in R&D.
- **The tax credit, tax deduction, or accelerated depreciation to be applied.** These are applied according to the characteristics of the business innovation investment, defining, for example, the tax regime for investments in laboratory equipment or in R&D subcontracted to other actors, both national and international, or even the geographical region where the innovation activities are conducted.

Given that both direct subsidies and tax incentives tend to reduce innovation investment costs for businesses, a simple analysis might suggest that the two instruments are close substitutes. However, more in-depth analysis reveals that there are significant differences from the perspectives of stimulating business innovation and fiscal policy.

From the perspective of innovation policies, there are at least three differences between the effectiveness of tax incentives and of direct subsidies. First, the impact of tax incentives on the marginal capital costs of innovation activities depends on the fiscal environment and will be less significant in a country with low taxes or for groups of actors that are often exempt from paying certain taxes or that contribute at a lower rate. Mainly for this reason, tax incentives are less effective as stimuli for innovation in regions with backward relative development (Harris, Li, and Trainor, 2009) or as stimuli for SMEs, given that simplified tax regimes usually entail lower effective tax rates for such businesses.[15] The fact that tax incentives are biased toward larger businesses is also worrisome, because bigger firms usually have the greatest capacity to take advantage of the benefits of innovation, which might mean that they could manage with a lower incentive.

[15] Furthermore, the final impact of a tax incentive on capital costs will also depend on how the investment is financed. If an investment is financed by a loan and the interest paid is tax deductible, then this also favors the big corporations, given their greater capacity to obtain external financing (Roca, 2010).

Second, the impact of an incentive depends, to a large extent, on the fiscal position of the enterprise itself and on its capacity to generate earnings. As this capacity is typically limited for SMEs and, above all, for enterprises that just entered the market, this instrument has limited power to promote entrepreneurial innovation. In other words, insofar as only larger companies can benefit from the entire tax incentive, the use of such instruments will tend to be regressive.

Third, and perhaps most importantly, the resulting innovation projects may differ, since firms receiving tax incentives generally decide which projects to invest in, whereas central planning authorities exercise greater control over which projects receive direct subsidies. In other words, it is certainly possible that projects financed by tax incentives are better aligned with maximizing private profits, whereas those supported by public subsidies may provide more social benefits. Since profits and social benefits do not always coincide, firms that receive tax incentives could end up executing practically the same projects they would have financed anyway, meaning those with the strongest market signals and less uncertainty, but which may not necessarily offer the greatest social return.

In summary, from the perspective of policies to stimulate innovation, direct subsidies have attributes that make them effective in ways that classic tax incentive programs are not, in particular:

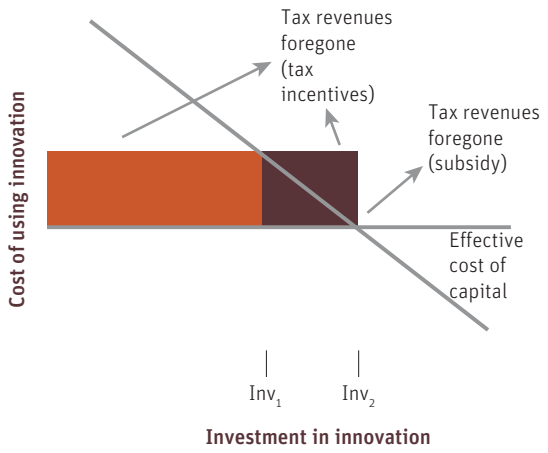
- The capacity to include projects with externalities is much greater in the case of direct subsidies.
- The capacity to focus public resources on those actors in the system that are expected to suffer most from market failures (i.e., innovative SMEs and entrepreneurs) is also a priori higher in the case of direct subsidies.
- The capacity to create greater additionality in relatively underdeveloped areas with a reduced tax burden is also higher for direct subsidies than for tax incentives.

From the perspective of fiscal policy, although both kinds of incentives entail costs, either in terms of cash transfers or tax expenditures, their net fiscal cost depends on the increase in investment in innovation that they achieve, on the impact of that investment on productivity, and on how much fiscal revenue is thereby generated. In this sense, a significant difference between direct subsidies and tax incentives is that subsidies operate "on the margin" (because they are project-based) and tax incentives operate on a firm's total innovation budget (when the design is volume-based). The result is that infra-marginal projects (i.e., projects that the firms could easily have carried out anyway) are also financed, and this obviously has a bearing on the relative efficiency of the two approaches.

To illustrate the efficiency of these two approaches, Figure 5.7 shows the social losses in terms of tax revenue under the volume-based tax incentive scheme in relation to the subsidy scheme. It also illustrates the increase achieved by a firm in its innovation investment level (from Inv1 to + Inv2) contrasted with the reduced cost of capital caused by the application of a tax incentive. It is noticeable that the

tax revenue that is foregone in the scenario that includes a volume-based tax credit is considerably greater than the fiscal cost of a subsidy that targets incremental projects.[16] The reason is that the tax incentive is granted over the total (or a percentage) of the level of R&D investment (in this case Inv1), whereas the subsidy is only for the incremental project. In other words, from an efficiency perspective, there is a clear advantage to project-based direct subsidies over volume-based tax incentives (Parra Torrado, 2011).

FIGURE 5.7: TAX INCENTIVES, SUBSIDIES, AND TAX EXPENDITURES FOREGONE



Source: Authors' elaboration.

Tax incentives, like direct subsidies, also have problems of moral hazard. For example, firms can "redefine" new activities or existing activities to comply with requirements and pass them off as innovation investments. This problem is accentuated in countries where there is limited institutional capacity to audit rigorously, and even more so wherever a deep-rooted culture of tax avoidance and evasion pervades. In other words, implementation of tax incentive schemes also requires the tax authorities to clearly define the auditing processes. The problem is that the authorities at these agencies are not generally experts in technological innovation, which might also prompt firms to include more activities than those that genuinely fulfill the regulatory definition of innovation activities.

In this regard, De Luis (2010) points out that tax incentives make the tax system more complex and create more uncertainty when it comes to interpreting legal regulations. This in itself means the administrative authority needs more resources for auditing, and it also creates more opportunities to manipulate the system to evade taxation. To mitigate these problems, governments are obliged to implement more rigorous auditing processes, which, obviously, increase program administration costs for both the government and the firms. Therefore, to draw a fair comparison, the greater costs of administration and compliance associated with direct subsidies have to be balanced with greater inspection costs entailed by tax incentives.

[16] The fiscal cost of tax incentives in developed countries have systematically increased over the last 20 years, with levels of between 0.06 percent of GDP in the United Kingdom and 0.29 percent of GDP in France (OECD and Eurostat, 2010).

Another feature in favor of direct subsidies from the fiscal policy perspective is that the budgetary process can at least incorporate their gross cost with a high degree of certainty and transparency. However, the cost of tax incentives (through lost tax revenue) depends on a series of decisions adopted by businesses that are entirely beyond the control of the tax authorities.

Finally, tax incentives can cause greater governance problems. In effect, they can come to the attention of powerful and well-organized lobby groups and, at the same time, since they are legally approved, they can become very difficult to eliminate. Moreover, in a world in which innovation activities are highly globalized, tax incentives can ultimately create transfers between different national tax authorities.[17]

In summary, the above discussion clearly shows that, although direct subsidies and tax incentives are closely related, their effects, when it comes to stimulating business investment in innovation, are different. The analysis also establishes that there are sufficient arguments from the perspectives of both stimulating business innovation and fiscal policy to favor direct subsidies over tax incentives. However, insofar as using tax incentives is often a foregone public policy decision, they should be implemented according to certain best practices that can mitigate problems, including the following:

- If an ex-post form is to be used, it should be based on an incremental system rather than a volume-based one, in which case the basis on which growth is to be calculated must be defined (Van Pottelsberghe, Megally, and Nysten, 2009). Although the fiscal cost of growth-based incentives is much lower, their implementation and monitoring is much more difficult. However, according to Hall and Van Reenen (2000), in practice there is no great difference between an incremental tax incentives program and a subsidy program insofar as the verification costs of tax incentives are comparable to the administration costs of a subsidy program.
- They should be granted ex-ante based on the competitive presentation of a specific project and on merit, and paid out only insofar as the project delivers results. Moreover, tax incentives should always represent a lower percentage than the total value of the innovation project in order to align the firm's objectives with the goals of public policy.
- From the perspectives of transparency and fiscal management, a methodology should be incorporated to estimate tax expenditures so that tax benefits can be predicted and monitored; this estimate should also be included in the annual budget. In this way, a fiscal quota could be clearly set, and beneficiaries would be obliged to compete for that quota based on the merits of their proposals. It is equally important to establish a limited life span for these incentives, so that by being temporary, they are less vulnerable to lobbies and can be easily removed if they turn out to be ineffective.

[17] If the country of origin of the investment applies global taxation criteria, then the incentive in the investment-recipient country often translates into greater net final taxation in the country of origin because of the amount of prepaid tax.

They must also be focused on a single tax. In this case, the focus should be income tax, which is the one that most directly influences the capital costs of investment.

- A clear and independent system must be established to monitor and evaluate the impact of these programs in order to assess their effectiveness in terms of additionality and to provide the most accurate measurement possible of their efficiency. Such a system requires extensive coordination between the innovation and tax collection agencies; however, the tax collectors must have the last word when it comes to decision making.
- The "anti-entrepreneurial bias" of tax incentives for innovation can be mitigated using schemes that include tax deferrals, thereby allowing the unused portions of fiscal credit to be transferred into future fiscal periods or to combine these provisions with cash refunds, in which case the tax incentives become a de facto subsidy (Criscuolo, 2009).[18]
- The project–based ex-ante formula increases the possibility of facilitating externalities and, thus, is a step in the right direction; however, it is also possible to stimulate externalities by augmenting fiscal credit for innovation activities that are outsourced to universities or implemented in collaboration with other firms.

It is worth stressing that in most LAC countries in which tax incentives for innovation are being implemented (Argentina, Brazil, Chile, Colombia, and Uruguay) some, or even all, of these best practices can be observed.

WHAT DO THE IMPACT EVALUATIONS TELL US?

Methodological Considerations

Given that innovation is affected by numerous market failures, the implementation of successful policies calls for efficient policy designs that can rectify these faults. Therefore, an optimum policy should vary not only from business to business, but also from project to project. In practice, however, governments suffer from grave information deficiencies (Toivanen, 2009), which can easily lead to incorrect results or to the crowding out of private financing by public aid.

One of the first questions in any impact evaluation should be how and when to measure a program's results. Crépon, Duguet, and Mairesse (1998) distinguish between innovation input indicators and economic performance indicators. Input indicators are most directly affected by the intervention, such as total investment in innovation carried out by the beneficiary. The degree to which innovation policies

[18] For example, this is case for France and the Netherlands.

alter the marginal capital costs for the business and affect its investment will define the degree that they generate an increase in business investment effort (input additionality). Economic performance indicators evaluate the overall results of innovation investment, or their "product additionality." For corporate innovation programs, important variables to measure product additionality include increases in productivity, employment, salaries, and exports.

The question of when these impacts should be evaluated depends on what is being measured. Normally, input additionality is measured over the short term, while the innovation project is being implemented, whereas product additionality is measured some time afterward. In general, the impact of different programs can show very different patterns over time, and an adequate consideration of these patterns is crucial for a satisfactory evaluation.

Even after the relevant indicators have been selected, evaluating the impact of public innovation support programs is no easy task, particularly when the intention is to establish a causal relationship between participation in the program and the results of interest. The definition of causality is based on the counterfactual concept. For example, if an enterprise receives a subsidy to invest in innovation and a certain result is observed, then the subsidy is said to have exerted a causal effect if that result differs from what would have been observed without the subsidy. Although this definition is relatively simple and intuitive, it presents a problem from the empirical point of view because the counterfactual result, by definition, is never actually observed. This problem can be tackled by establishing, alongside the group of firms that take part in a given program (the target group), a group of firms that do not participate in that, or in any other, program (the control group), selected in such a way as to minimize the observable differences between the two groups.

When business innovation support programs are evaluated, however, the approach becomes more complicated because of the nature of the market failures that justify these interventions. In effect, a central element in these interventions is the need to correct, through the presence of associated externalities, the non-rival and non-excludable nature of the knowledge generated. In this sense, a complete impact evaluation of these programs should not only identify their impact on the direct beneficiaries, but also other possible effects exerted on any indirect beneficiaries of the program. Counterfactual groups of both direct and indirect beneficiaries are therefore required. It is precisely by identifying these externalities that the limitations of the impact evaluation of fiscal incentives for business innovation programs are discovered, and the empirical evidence is only recently beginning to be developed.

All the evaluations examined in this chapter were based on relating primary beneficiary information with official corporate register databases (e.g., industrial or innovation). This approach allowed the participating firms in each program to be identified accurately and a control group to be generated for each program based on observable similar characteristics. The search for possible firms for the control group

was done using statistical pairing mechanisms, whereas the impact measurements make use of difference-in-differences methodologies, fixed effects on panels of enterprises, and, in some cases, on instrumental variables.[19] All the evaluations were conducted at both the beneficiary and project levels.

The remainder of this section summarizes the results of the described evaluations with regard to input additionality, observing the impact of different programs on the investments firms make in innovation and attempting to infer up to what point there might have been inducement or displacement effects on private investment. The evaluation results are then summarized with regard to product additionality, observing the impact of different programs on productivity over a much longer period of time. It is important to remember that, due to the heterogeneous nature of the available information and the data sources, the evaluations herein described are not based on identical techniques, which means that their results are not comparable in every case. Furthermore, due to a lack of information when the evaluations were conducted, no measurements of the impact of indirect effects are included.

Input Additionality

The preferred approach to impact evaluations in the LAC region has been to evaluate input additionality. Table 5.1 presents the results of the 13 evaluations conducted in the region using this method.

The top half of Table 5.1 summarizes seven studies where the principal dependent variable to indicate impact is the absolute value of investment in R&D or innovation in the enterprise (in logarithms). In five of these cases, the principle dependent variable is private R&D (or net R&D after subsidies), whereas in the other two cases it is the total investment in innovation or R&D. The bottom half of the table summarizes six studies where the principle indicator is the intensity of innovation or, in other words, spending on innovation or R&D as a fraction of sales or of total investment. In two of these cases, the indicator is calculated net after subsidies, whereas in the remaining cases total innovation is used.

Some interesting points arise from Table 5.1. First, the different studies clearly demonstrate that fiscal incentives have effectively stimulated innovation or investment in R&D. In all cases, there was an average treatment effect on the treated that was positive and significant (e.g., the businesses that received fiscal support increased their investments in innovation). This suggests that, in general, the programs have been well focused, with a target group made up of businesses with appropriation problems or financial difficulties, or both. When these restrictions are eased, the businesses react favorably by increasing their innovation investment.

Second, the impact is noticeably positive and significant in the seven evaluations where the principal indicator is private investment in innovation or in R&D, thereby demonstrating that firms receiving

[19] For more details, see Hall and Maffioli (2008) and Crespi et al. (2011).

TABLE 5.1: EVALUATION OF THE INPUT ADDITIONALITY, SELECTED LAC COUNTRIES

COUNTRY	EVALUATION PERIOD	NAME OF PROGRAM	INTERVENTION	BENEFICIARIES	INDICATOR	IMPACT	ATTRACTION/ EXCLUSION	METHOD
Argentina (1)	1994–2001	FONTAR–TMP1	Subsidized loan	Businesses	Investment ln (total *R&D*)	0.15**	Attraction	FE–IV
Argentina (2)	1998–2006	FONTAR–ANR	Parallel subsidies	Businesses	Investment ln (private innovation)	0.18*	Attraction	FE–CS
Panama (3)	2000–2003	FOMOTEC	Parallel subsidies	Businesses	Investment ln (total *R&D*)	0.15**	No evidence	FE–CS
Uruguay (4)	2000–2006	PDT–I	Parallel subsidies	Businesses	Investment ln (private innovation)	0.84**	Attraction	FE–CS
Mexico (5)	2004–2007	EFIDT	Fiscal credit R&D	Businesses	Investment ln (private R&D)	0.25**	Attraction	FE
Colombia (6)	2000–2002	Fiscal incentives	Fiscal credit R&D	Businesses	Investment ln (private R&D)	0.06**	Attraction	SM
Argentina (7)	1995–2001	FONTAR CFF	Fiscal credit R&D	Businesses	Investment ln (private R&D)	0.13***	Attraction	FE
Argentina (8)	2001–2004	FONTAR–ANR	Parallel subsidies	Businesses	Total intensity *R&D* (%)	0.18**	No evidence	DID–PSM
Brazil (9)	1996–2003	ADTN	Subsidized loan	Businesses	Private intensity *R&D* (%)	0.66**	Attraction	PSM
Brazil (10)	1999–2003	FNDCT	Parallel subsidies	Businesses & Universities	Private intensity *R&D* (%)	1.63**	Attraction	PSM
Chile (11)	1998–2002	FONTEC	Parallel subsidies	Businesses	Total intensity *R&D* (%)	0.74*	Partial exclusion	DID–PSM
Panama (12)	2006–2008	SENACYT	Parallel subsidies	Businesses	Total intensity *R&D* (%)	0.13**	Attraction	PSM
Colombia (13)	2002–2003	Cofinanciación	Parallel subsidies	Businesses & universities	Total intensity *R&D* (%)	1.20*	Attraction	PSM

Sources: (1) Chudnovsky et al. (2006); (2) López, Reynoso, and Rossi (2010); (3) Maffioli, Pusterlay, and Ubfal (2011); (4) López and Rossi (2010); (5) Calderón-Madrid (2010); (6) Mercer-Blackman (2008); (7) Binelli and Maffioli (2007); (8) Chudnovsky et al. (2006); (9) De Negri, Borges Lemos, and De Negri (2006a); (10) De Negri, Borges Lemos, and De Negri (2006b); (11) Benavente, Crespi, and Maffioli (2007); (12) Crespi, Solís, and Tacsir (2011); and (13) Crespi, Maffioli, and Meléndez (2010).
Notes: Methods: FE–IV (fixed effects, instrumental variable), FE–CS (fixed effects, cross section, and common support), FE (fixed effects), SM (structural modeling), DID–PSM (difference-in-differences, propensity score matching), PSM (propensity score matching). In the case of the evaluation of SENACYT in Panama, the intensity total of R&D is calculated as R&D over the total of innovation sales. ***Significance level of 1%; ** Significance level of 5%; *Significance level of 10%.

fiscal support also react by increasing their innovation investment. This might be the result of various different transmission mechanisms. It might be that the fiscal support is directed toward riskier projects, thereby inducing private financing of less risky, related investments. Or, it might be that the goal of public support is to encourage infrastructure projects, thereby diminishing the capital costs of all subsequent projects. Finally, it might be that the fiscal incentive has a signal effect on the quality of the project and on the research team, thereby enabling the business to leverage additional funds in the financial markets. The qualitative interviews included in the evaluation of Chile's FONTEC project seem to suggest that the signal effect there has been significant (Benavente, Crespi, and Maffioli, 2007).

With regard to displacement or crowding out, only in one case is there some (weak) evidence of a partial displacement of private investment. There are two other cases in which the increase in innovation investment coincides with the amount of the subsidy, but there is no additional inducement effect toward greater private financing. The only three cases in which there is no observable evidence of inducement effects on private financing correspond to variants of the partial subsidy system, which suggests that insofar as the subsidy programs provide financing at zero cost, the potential multiplier effect of the financing on private investments might be reduced. In contrast, the conventional loan or tax credit schemes seem to be more efficient at generating these multiplier effects.

There is, however, an important exception. In two cases, it is the partial subsidy designs that had the greatest impact on investment of all the instruments, and the greatest multiplier effect with regard to leveraging private investment in innovation (see the impact column): Brazil's FNDCT and Colombia's Cofinanciación. The principal characteristic of these projects is that financing is linked to collaboration between businesses and universities. Therefore, the subsidy programs seem to be ideally suited to encouraging links between different actors in the innovation system. This particular characteristic might have contributed to overcoming both the technical and the financial limitations (e.g., lack of human resources, specialized research infrastructure, and technical knowledge), and this mitigation might have produced the multiplier effect on private financing.

An important limitation of the evaluations is the small sample sizes, which means that it cannot be established whether the impact of the program evaluated varied according to business subgroups. However, in the case of Argentina's FONTAR–ANR program, the sample size was large enough to evaluate if its impact varied according to a firm's prior experience in managing innovation projects. It is revealing that the evaluators discovered a substantial increase in private investment in R&D by new innovators (and some evidence of displacement of resources in the case of more experienced innovators). In other words, although very limited, evidence suggests that partial subsidies had a favorable impact on those firms with limited experience in formulating and executing innovation projects (Chudnovsky et al., 2006).

Finally, the various evaluations do not find that tax credits and subsidized loans have systematically different impacts. In both cases, there are multiplier effects of attraction and similar impacts on total

innovation investment by businesses, although these effects are concentrated in the sphere of the larger or more mature companies.

Methodologically, most of the studies use techniques based on measuring the propensity to participate in order to find matching pairs for controls. This allows the principal determinants of the probability of being chosen for any of these programs to be evaluated. According to various studies, the firms with higher levels of human capital, or with previous experience in administering R&D and innovation programs, have the greatest chances of being selected. This is only to be expected, given that in every case the technical evaluators of the agencies always place greater importance on these two indicators when it comes to assessing each proposal.

The problem of a selection system based on antecedents of excellence is that what might be considered a good result in the short term might also trigger unexpected dynamic effects over the long run. A highly meritocratic evaluation system might lead to only the very good candidates being selected, who might then be reselected after future calls for proposals. This might give rise to a dynamic "Matthew effect," which can lead to open competition and fairness being jeopardized by the formation of powerful elites. More research is needed to assess whether or not these endogamy effects are present, but it is a subject that requires monitoring in the near future. It is important to have unambiguous exit strategies for the different schemes and to make it clear to participating firms that the support has a limit. This ceiling should be fixed at exactly the right level to promote excellence without compromising on variety. Subsidies seem to be especially apt for maintaining the correct balance between excellence and diversity.

In general, the results from the LAC region are not significantly different from other international evidence. Various studies on the impact of fiscal incentives on business investment in innovation also tend to reject the displacement hypothesis. David, Hall, and Toole (2000) and Klette, Møen, and Griliches (1999) present exhaustive reviews of the main empirical studies that measure the impact of public financing on innovation investment by businesses during the 1990s in developed countries. According to David, Hall, and Toole (2000), two-thirds of the studies find that public financing of R&D substitutes for private R&D investment. Furthermore, Aschhoff (2009) presents an updated review of the most important results of the numerous analyses that proliferated in the previous 10 years, thanks to growing data availability. The majority of these results confirm the absence of displacement effects and some provide evidence of multiplier or inducement effects on private investment. In summary, the LAC evaluations are in line with the international evidence about the efficiency of fiscal incentives with regard to input additionality.

Product Additionality

At the international level, there are fewer studies that analyze the effect of public support on the product of innovation investment (e.g., patents, number of new products, or sales of new products) or on

business performance. The results of existing studies are less conclusive, although some positive effects have been identified. The principal difficulty in evaluating the effects of fiscal incentives on product additionality is that a longer time horizon is needed to detect any effect. In particular, these effects are detectable only after a peak in the innovation, the learning process it engenders, and the distribution of the technology. This implies that a rigorous evaluation of these effects might require panel data for a minimum period of five years after a firm received public funding.

The evaluations in the LAC region are not exempt from this problem. Numerous evaluations, carried out by the Inter-American Development Bank (IDB) between 2005 and 2007 (IDB, 2007) and summarized by Hall and Maffioli (2008), do not find consistent effects either in patent applications or in new products, and the evidence concerning company performance is also mixed, with positive results in terms of growth, but scant impact in terms of productivity.

As previously mentioned, this might be due to the fact that in many of these evaluations product additionality is examined with reference to the same period in which the innovation project was carried out. Therefore, it might be the case that the amount of time passed for evaluating product additionality was too short.

To bridge this information gap, the IDB is currently reevaluating several of the programs in Table 5.1 over a longer time frame, and observing the impact they have had on growth and on labor productivity. The following programs have already been reevaluated: (i) the Cofinanciación program (Crespi, Maffioli, and Meléndez, 2010); (ii) the Business Technology Modernization Fund (Fondo de Modernización Tecnológica Empresarial, or FOMOTEC) (Maffioli, Pusterlay, and Ubfal, 2011); (iii) Chile's National Fund for Technological and Productive Development (Fondo Nacional de Desarrollo Tecnológico y Productivo, or FONTEC) (Álvarez et al., 2011); and (iv) Chile's Scientific and Technological Development Support Fund (Fondo de Fomento al Desarrollo Científico and Tecnológico, or FONDEF) (Álvarez et al., 2011).

Implementing these long-term evaluations required closer coordination between national statistics offices. In reality, one of the inconveniences of the previous evaluations was that they were based on connecting beneficiary data with innovation surveys. Although the innovation surveys are important instruments for gathering data on innovation investment (and for evaluating input additionality), their samples are often based on repeated cross sections of randomly selected enterprises. This makes it almost impossible to monitor these companies over longer periods of time. To solve this problem, the evaluators have worked with the national statistics offices to establish connections between beneficiary data and the data from commercial registers, thereby enabling monitoring of firms over a prolonged period of time. Even so, data inter-connection can only be constructed with already existing databases, which in this case limits the results to the analysis of manufacturing firms and enterprises with more than 10 employees.

The results of the four reevaluated programs are summarized in Table 5.2. All the programs were evaluated using the same methodological approach and the principal product indicator was labor productivity. In every case, the principal dependent variable is expressed in logarithms.

The results suggest that fiscal incentives have had a significant impact on business performance, with increases in labor productivity ranging from 13 percent in Panama to 15 percent in Colombia. The results are statistically significant for the standard levels. The productivity increases for the two Chilean programs were 9 percent for FONTEC and 12 percent for FONDEF.

Having two programs in the same country is also interesting because it enables closer comparisons. Specifically, the presence or absence of significant synergies between the two programs can be established by identifying those beneficiaries that have participated in both programs. In effect, by reevaluating the Chilean programs, while bearing in mind whether their beneficiaries had used the other program or not, established solid evidence of synergies. The firms that received support only from FONTEC showed a 6 percent (and insignificant) increase in productivity; the firms benefiting only from FONDEF showed a 10 percent (and significant) increase in productivity; and the firms benefiting from both programs showed a 24 percent (and significant) increase in productivity.

There are differences in the main characteristics of FONTEC and FONDEF. FONTEC is a partial subsidy program whereby projects are chosen based on an open window system. In contrast, FONDEF gives subsidies for collaboration between universities and private sector firms, and its selection process is based on competitive calls for proposals. This might explain why FONDEF has had a systematically greater impact than FONTEC on business productivity. Even so, given the important complementary effects of both programs, their combination seems to provide the ideal option: the incentive for collaboration between universities and businesses could overcome coordination failures while, at the same time, incentives for businesses might tackle the problem of a lack of funding or appropriation problems.

For Cofinanciación and FOMOTEC it has been possible to follow the trail of the impacts throughout the time elapsed since exposure to the program. It was discovered that these effects linger and, in some cases, even increase over time. They also become more significant between three and five years after the firms began to receive support. These results demonstrate the utility of long-term impact evaluations. They do not imply that the final impact evaluations need necessarily be conducted five years after the project execution, but rather that monitoring of the first generation of supported enterprises must be maintained over time. This was exactly the approach adopted by the United States Congress to evaluate the Small Business Innovation Research Program (SBIR) when it called on the Small Business Administration to monitor the first three generations of supported firms throughout the following decade (Lerner, 1999).

TABLE 5.2: EVALUATION OF THE PRODUCT ADDITIONALITY IN CHILE, COLOMBIA, AND PANAMA

COUNTRY	EVALUATION PERIOD	NAME OF PROGRAM	INTERVENTION	BENEFICIARIES	INDICATOR	IMPACT	METHOD
Colombia (1)	1995–2007	Cofinanciación	Parallel subsidies	Businesses & Universities	Labor productivity	0.15***	FE–CS
Chile (2)	1998–2006	FONTEC	Parallel subsidies	Businesses	Labor productivity	0.09***	FE
Chile (2)	1998–2006	FONDEF	Parallel subsidies	Businesses & Universities	Labor productivity	0.12***	FE
Chile (2)	1998–2006	FONTEC only	Parallel subsidies	Businesses	Labor productivity	0.06	FE–CS
Chile (2)	1998–2006	FONDEF only	Parallel subsidies	Businesses & Universities	Labor productivity	0.10***	FE–CS
Chile (2)	1998–2006	FONDEF+FONTEC	Parallel subsidies	Businesses & Universities	Labor productivity	0.24***	FE–CS
Panama (3)	2000–2003	FOMOTEC	Parallel subsidies	Businesses	Labor productivity	0.13*	FE–CS

Sources: (1) Crespi, Maffioli, and Meléndez (2010); (2) Álvarez et al. (2011); and (3) Maffioli, Pusterlay, and Ubfal (2011).
Notes: FE–CS (fixed effects, cross section, and common support) and FE (fixed effects). ***Significance level of 1%; **Significance level of 5%; *Significance level of 10%.

EMERGING THEMES

The review of the different evaluations alongside the institutional lessons learned in the region leads to a series of questions about the design of policies that seek to promote business innovation by using fiscal stimuli. This review also raises issues for inquiry in the future.

Federalism and Innovation Policies

Various LAC countries—above all, the largest—have taken significant steps toward decentralizing public policy decision making and moving it to provincial and local governments. This is what already happens in countries such as Argentina, Brazil, Chile, Colombia, and Mexico. In these countries, national or federal fiscal incentive programs are beginning to coexist with subnational schemes. The coexistence of innovation interventions at various levels also characterizes some important territorially developed countries, such as Canada and the United States.

Based on the experience in OECD countries, although in principle subnational fiscal incentives for innovation increase the total generosity of the support offered to local firms, their overall effect is unclear, above all bearing in mind the potential negative effect of innovation on the neighboring jurisdictions (OECD and Eurostat, 2010). With regard to the proliferation of fiscal incentives for R&D at the state level in the United States, Wilson (2009) concludes that, although these incentives efficiently increase R&D in the states where they are granted, almost all of the increase is due to the R&D attracted from other states (which suggests zero aggregate results). The risks that LAC countries might end up in a similar position cannot be ignored. Therefore, further research must be conducted, and a better system for gathering data should be established in the region, in order to evaluate the innovation policies at multiple layers of government.[20]

Innovation Policies and Encouragement for Dynamic Entrepreneurship

Diverse obstacles make it difficult to use innovation policies to promote dynamic entrepreneurship. First, since the subsidies are normally paid ex-post, entrepreneurs experiencing credit flow problems might not find this kind of financing to be of much help. Second, it might be that the speed at which decisions are normally made within the framework of the region's innovation agencies might be too slow for newly formed companies (Toivanen, 2009). Third, the evidence from developed countries shows that the cost of soliciting subsidies diminishes as the size of the firm increases. Finally, tax incentives are not very efficient for enterprises that are just starting out and have yet to generate taxable earnings.

Despite these limitations, direct subsidies can support dynamic entrepreneurship through two potential channels. First, since direct subsidies are granted for a single project, they might activate a signal effect in the financial sector about the quality of the innovative idea, thereby mitigating the severity of the financial limitations (Lerner, 1999). Second, the agencies responsible for implementation might design subsidies that favor collaboration between new enterprises and the large, established businesses or the universities, which could contribute to reducing limitations. Up to what point direct subsidies can also stimulate dynamic entrepreneurship is an empirical question; however, the limited evidence on the subject that arises from the FONTAR–ANR program indicates that partial subsidies might have the potential to support new innovators.

Even so, it might be that subsidies are not the best intervention to foster entrepreneurship, especially if the binding constraints are a lack of business culture and human capital (as seems to be the case in many developing countries) or a lack of sufficient financial instruments (e.g., capital guarantee funds or

[20] The problem of data gathering is not minor given that recent research about regional innovation systems in LAC countries point out that the microeconomic data in the region often lacks sufficient geographic scope (IDB, 2011).

capital risk funds). The efficiency of partial subsidies in promoting dynamic entrepreneurship will depend on their complementarities with financial instruments and the availability of human capital.

The Special Characteristics of the Service Sector

In spite of the fact that services dominate economic activity, they have been the subjects of much less research by innovation policy analysts. However, during the last 10 years, there has been increasing interest in understanding innovation in the service sectors of developed countries. The results from these investigations show that services innovate differently than manufacturing firms (e.g., innovations are less based on R&D and more focused on informal arrangements, information and communication technologies, and user–producer interactions), and that a single solution for innovation in services might be inefficient, given that it is a diverse set of sectors, both with regard to production and to innovation (Tether, 2003).

In contrast, there are still no systemic studies of this kind in the LAC region. The urgency to understand the determinants of innovation in services, and to evaluate those market failures that might jeopardize it, is evident given that the service sector employs a significant portion of the labor force, and its low growth in productivity seriously affects aggregate growth performance in the region (IDB, 2010). The dilemma for public policy making is clear: if services innovate differently than manufacturers, the stimulus required in this sector might require new policy and program design. To bridge the knowledge gap between the determining factors of innovation and productivity in services, efforts to gather data must be improved. Although some countries in the region have begun to collect information about innovation in the services sector, the emerging evidence has yet to be fully evaluated.

From Input-Based Incentives to Results-Based Incentives

In general, the majority of fiscal incentives reviewed in this section focus on the idea that if the problem is underinvestment, then the incentive must seek to increase investment. In practice, this is complicated, since the final impact of a greater investment in innovation on productivity is not necessarily guaranteed if the investments themselves are not highly productive, or if they displace, albeit partially, other similar or more productive investments. Although the different impact evaluations reviewed suggest that, in general, this greater investment level is also productive, the question arises whether or not it is possible to enhance the effectiveness of interventions by generating incentives that turn out to be linked less to inputs and tied more to results. More and more frequently, in the developed world, countries are starting to experiment with results-based tax incentives, such as the revenues generated by innovated products or by the sale of licenses for patented technologies (e.g., HM Treasury Patent Box proposal in the United Kingdom). This latter case is particularly interesting, given that the incentives are associated with technology dissemination activities by its original owner; in other words, it is precisely the generation of externalities that is rewarded. Some LAC countries are also taking the first steps in this direction by segmenting

the support for inputs associated with intermediate results and/or by linking earnings from intermediate technologies to the royalties associated with the transferred technology. However, this is still in the incipient stage, and more research is called for to measure the impact of these reforms on the general efficiency of the system.

CONCLUSIONS

This chapter presents the most recent trends in designing and evaluating public policies aimed at promoting business innovation in the LAC region. Although innovation policy is quite broad and complex, this chapter focuses on fiscal incentives as an instrument to stimulate business investment in innovation. Various LAC countries have experimented with fiscal incentives since the beginning of the 1990s. In contrast to OECD countries, LAC countries display a clear bias in favor of direct transfers to the private sector, and only a few have commenced more recently in experimenting with tax incentives. The fiscal budgets allocated to these programs are insubstantial and affect only a small number of firms in the region. In this sense, it might be said that business innovation policy in the region is really only just in its infancy.

This chapter provides a description of the principal advantages and disadvantages of different fiscal incentives, concluding that there are solid arguments to use direct subsidies rather than tax incentives to stimulate investment in innovation and fiscal policy. However, the chapter also suggests alternative ideas for a tax incentives scheme that would maximize effectiveness and minimize secondary effects.

In spite of their short life span, various programs in the region have already been evaluated and this chapter takes advantage of the existing studies to provide a qualitative meta-analysis of the pioneer programs functioning since the beginning of the 1990s. The main conclusions are quite clear. First, there is evidence of a positive impact on input additionality (i.e., fiscal incentives have effectively increased investment by businesses in innovation projects and leveraged private resources for these investments). Second, the financing mechanisms have different effects on different beneficiary groups: despite the fact that the risks of displacement of private investment are lower in the case of programs based on subsidized loans or tax incentives, parallel subsidies seem to be the most effective in the case of new innovators or when it comes to promoting connections between businesses and universities, meaning that they have greater potential for reaching a target population. Third, the effects can also be positive with regard to product additionality and productivity, if and when sufficient time has transpired since the subsidy was first granted. In fact, the different studies that analyzed product additionality point out that the positive impacts on labor productivity began to appear only after three to five years had elapsed since a project's inauguration.

Despite the aforementioned results, relatively little is known about the efficiency of tax incentives. It is necessary to conduct more research to identify the effects of these programs on indirect beneficiaries (externalities) and on consumers, as well as their social costs in terms of fiscal resources and the distortions generated on related markets. It is evident that these elements must form part of any future research agenda in the LAC region.

There is a significant ongoing institutional capacity building process in the region with regard to designing and implementing tax incentives to stimulate business innovation, and it is important to

emphasize that many of the findings are gradually becoming integrated into public planning. The hope is that the effectiveness, and perhaps the efficiency, of these programs will continue to grow over time, while their range extends simultaneously.

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