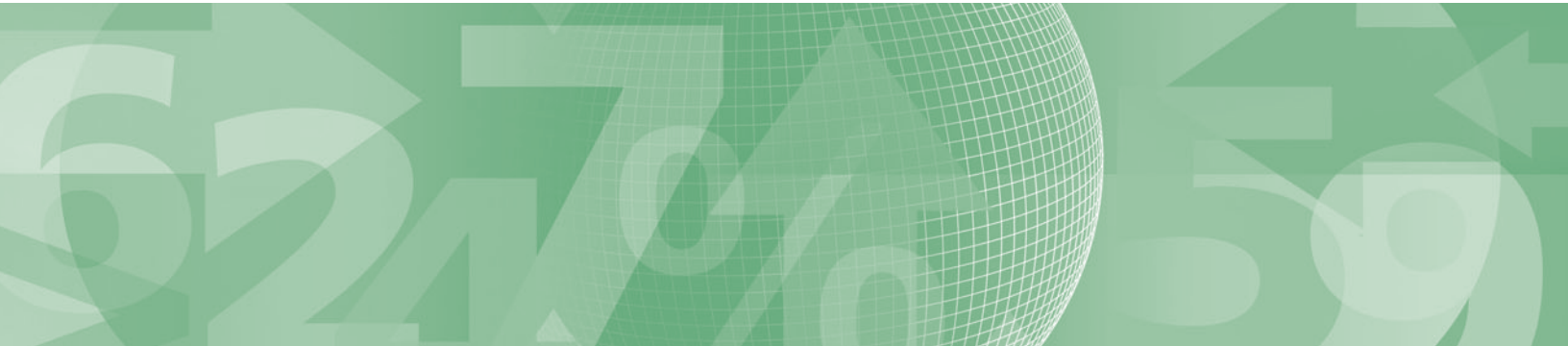


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Yasemin Bal Gündüz, Christian Ebeke, Burcu Hacibedel,  
Linda Kaltani, Vera Kehayova, Chris Lane, Christian Mumssen,  
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Cover design: IMF Multimedia Services Division

**Cataloging-in-Publication Data**  
**Joint Bank-Fund Library**

The economic impact of IMF-supported programs in low-income countries /  
Yasemin Bal Gündüz ... [et al.]. – Washington, D.C. : International Monetary Fund,  
2013.

p. : col. ill., col. map ; cm.

Includes bibliographical references  
Occasional papers series ; no. 277

1. International Monetary Fund – Developing countries. 2. Economic assistance – Developing countries. 3. Poverty – Developing countries.
4. Poverty – International cooperation. 5. Developing countries – Economic conditions. I. Bal-Gündüz, Yasemin. II. International Monetary Fund.

HG3881.5.I58E26 2013

ISBN: 978-1-48439-471-7 (print)  
ISBN: 978-1-47555-903-3 (ePub)  
ISBN: 978-1-48438-651-4 (Mobipocket)  
ISBN: 978-1-47553-701-7 (PDF)

Disclaimer: The views expressed in this book are those of the authors and should not be reported as or attributed to the International Monetary Fund, its Executive Board, or the governments of any of its member countries.

Publication orders may be placed online, by fax, or through the mail:  
International Monetary Fund, Publication Services  
P.O. Box 92780, Washington, DC 20090, U.S.A.  
Tel.: (202) 623-7430 Fax: (202) 623-7201  
E-mail: [publications@imf.org](mailto:publications@imf.org)  
Internet: [www.elibrary.imf.org](http://www.elibrary.imf.org)  
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This paper is based on studies that were conducted in 2012 and 2013 as part of the IMF's review of its lending facilities aimed at low-income countries. The work was headed by Chris Lane and Christian Mumssen, with Yasemin Bal Gündüz, Christian Ebeke, and Linda Kaltani responsible for the econometric work and Joseph Thornton for much of the drafting. Burcu Hacibedel and Nkunde Mwase provided case studies, Vera Kehayova provided research assistance, and Mercedes San Pedro-Pribram finalized the text, figures, and tables. Hugh Bredenkamp provided overall supervision.

The authors are indebted to Dane Rowlands and Graham Bird for their helpful thoughts on the econometrics, as well as to numerous members of Fund departments for their detailed comments on the paper. David Einhorn edited the paper; Joanne Johnson and Michael Harrup of the Communications Department coordinated publication; and Jeremy Mark of the same department offered valuable assistance to the authors in navigating the publication process. The paper also builds upon previous work by IMF staff members on the role of the institution in low-income countries.

The opinions expressed in the paper are those of the authors, and do not necessarily reflect the views of national authorities, the IMF, or its Executive Directors.

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CFF	Compensatory Financing Facility
CPIA	Country Policy and Institutional Assessment
ECF	Extended Credit Facility
EFF	Extended Fund Facility
ENDA	Emergency Natural Disaster Assistance
EPCA	Emergency Post-Conflict Assistance
ESAF	Enhanced Structural Adjustment Facility
ESF	Exogenous Shocks Facility
FDI	foreign direct investment
GEE	Generalized Evaluation Estimator
HAC	High Access Component
HIPC	Heavily Indebted Poor Countries
IEO	Independent Evaluation Office
IMF	International Monetary Fund
LICs	low-income countries
MDRI	Multilateral Debt Relief Initiative
ODA	official development assistance
PRGF	Poverty Reduction and Growth Facility
PRGT	Poverty Reduction and Growth Trust
PSI	Policy Support Instrument
PSM	Propensity Score Matching
RAC	Rapid Access Component
RCF	Rapid Credit Facility
SAF	Structural Adjustment Facility
SBA	Stand-By Arrangement
SCF	Standby Credit Facility
SDR	Special Drawing Right
STF	Systemic Transformation Facility



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The last 25 years have witnessed a profound transformation in the economic fortunes of low-income countries (LICs). A marked improvement in macroeconomic policies has resulted in improved fiscal performance, stronger external positions, and, most importantly, significant long-term increases in real GDP per capita growth and reductions in poverty. While some of the achievements occurred in the context of an unusually benign global environment, LICs continued to grow during the global financial crisis.

This paper assesses how the involvement of LICs in IMF-supported programs may have affected these economic developments. Chapter 2 examines the evolution of IMF-supported programs over the past quarter-century. During this period, the IMF has engaged in financial or nonfinancial arrangements with more than half of all LICs, and more than three-quarters of all IMF-supported programs have been with LIC members. The nature of IMF engagement has also undergone significant change over this time, evolving from more prescriptive structural adjustment programs toward support for country-led development agendas, in part reflecting changes in the LICs themselves. This paper presents a series of country case studies to highlight developments in the nature of IMF-supported programs.

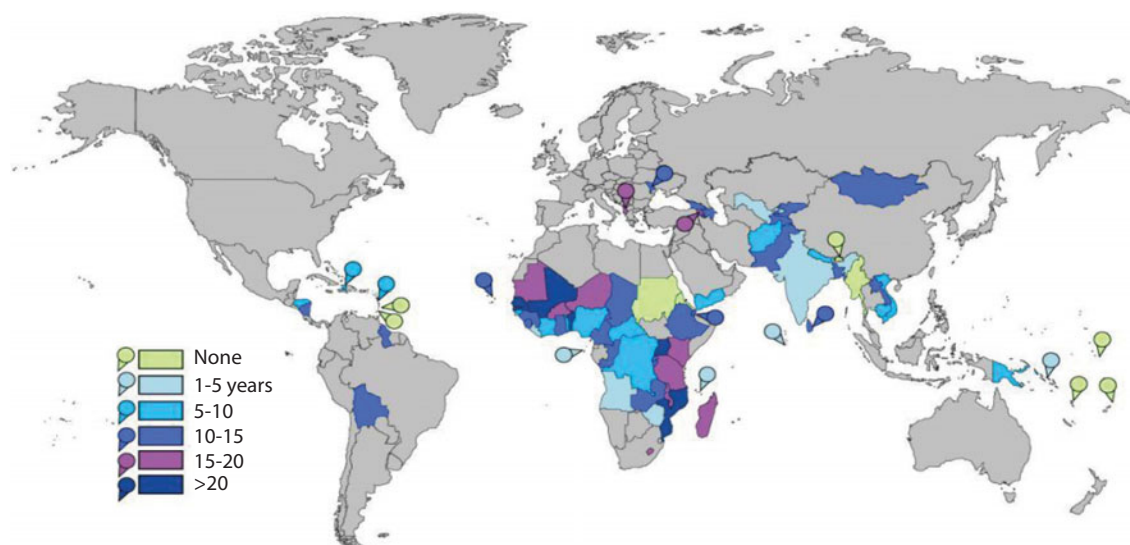
Disentangling the specific impact of IMF support from broader economic and development trends in LICs is no easy task. The vast academic literature on this subject—which has typically focused on a mixed sample of LICs and middle-income economies—has found both positive and negative effects of IMF-supported programs on economic performance, depending on the econometric methodology and sample used (Chapter 3).

The fundamental methodological challenge in assessing the impact of IMF-supported programs is selection bias: countries that approach the IMF often do so because they are already facing economic difficulties or expect to experience problems in the near future. Thus, a simple comparison of performance of IMF-supported program countries with nonprogram countries can be misleading.

Another difficulty in evaluating IMF support is the vast differences in country characteristics and situations. The literature has typically used country samples that mix LICs and middle-income economies. These samples tend to overlook the particular characteristics of LICs as well as the distinct nature and objectives of Fund engagement in these countries. LICs face a number of challenges that differentiate them from other economies, including the following:

- **Nature of shocks.** While emerging market economies may experience “sudden stop” types of capital account crises, LICs are more vulnerable to other domestic and external shocks that tend to occur more frequently and reflect the countries’ lack of economic development and diversification.
- **Access to financing.** LICs have less access to domestic or external financing, making them dependent on donor assistance and, periodically, on IMF-supported programs that can help catalyze such assistance.
- **Longer-term challenges.** IMF-supported programs with LICs tend to focus more on medium- or longer-term objectives that are important for poverty reduction and growth, and which tend to extend well beyond the duration of an individual program. In this context, these programs emphasize more capacity building and institution building rather than just provision of financing and short-term policy advice.

As a result of these factors, IMF-supported program engagement with most LICs has generally been less episodic than with other countries, and more continuous in nature. Consequently, analyzing the impact of IMF support by looking at snapshots of performance right before and after an individual program, as most studies do, tends to ignore the repeated nature of Fund engagement with most LICs and does not measure progress toward the longer-term objectives pursued under these programs (Figure 1.1).

**Figure 1.1. Low-Income Countries: Number of Years of IMF-Supported Program Engagement, 1986–2011**

Source: IMF staff calculations.

A related limitation of the existing literature is that it has generally not differentiated IMF-supported programs by types of instruments. To tailor its support to member countries, the Fund offers a diverse range of instruments—medium-term support, episodic short-term and emergency financing, precautionary financing, and nonfinancial policy support. Economic objectives tend to differ under these instruments. In particular, medium-term instruments place greater emphasis on addressing entrenched imbalances and institutional weaknesses, while short-term instruments are more focused on financing and adjustment to shocks. These differences can have important implications for the examination of the impact of Fund engagement on macroeconomic outcomes.

In recent empirical work, the Fund staff has sought to shed light on the impact of IMF-supported programs in LICs, taking the above methodological challenges into account (IMF, 2012b; Mumssen and others, 2013). This empirical work breaks down IMF-supported programs with LICs into two subsets: those aiming to provide more prolonged support, and those aiming to provide short-term financing in response to shocks (Chapter 3). This paper also proposes a number of other refine-

ments to the existing literature, including taking into account the implementation of IMF-supported programs and examining a wider range of macroeconomic and social outcomes using Propensity Score Matching (PSM) to correct for selection bias.

Using these techniques, our evidence suggests that longer-term IMF program support may indeed have helped LICs sustain economic growth and boost resilience by building fiscal buffers. The findings indicate that while the majority of LICs improved their longer-term macroeconomic performance, this tendency was more pronounced for those with longer-term IMF support (at least five years of program engagement per decade). Specifically, controlling for selection bias, the paper shows that between 1986 and 2010, IMF-supported LICs experienced, on average, significantly higher real per capita GDP growth, fiscal balances, foreign investment, and social spending compared to LICs without such support. Countries with longer-term IMF engagement also tended to attain significant reductions in poverty, income inequality, inflation, and growth volatility relative to their control group.

A further noteworthy finding is that, controlling for the presence of longer-term IMF engagement,

the scale of Fund financing does not appear to be significant in determining outcomes over long time frames. The paper therefore considers how IMF engagement may have supported long-term growth and poverty reduction beyond the provision of finance, such as through the role that programs play in helping to develop a consistent policy framework, and through the impact of surveillance and technical assistance activities (Chapter 3).

This is not to suggest that concessional financial support from the IMF necessarily takes a back seat to policy support or other forms of assistance. During the global financial crisis, for example, the sharp increase in Fund disbursements helped relax liquidity constraints in LICs, which allowed many to preserve vital spending and facilitated a more rapid recovery than would otherwise have been the case. In this vein, this paper also presents evidence from a longer sample period that suggests that IMF financial support has the greatest impact when LICs are faced with substantial short-term

imbalances or shocks. Specifically, after controlling for selection bias, stepped-up IMF financing through augmentations of existing programs or short-term and emergency facilities is positively associated with short-term growth and indicators of macroeconomic stability.

The final chapter of this paper reviews the implications of the findings for IMF engagement in LICs going forward, and suggests ways in which the Fund's facilities will need to evolve further if the institution is to remain relevant to its LIC members. While the IMF has played a helpful, if ancillary, role in supporting the growth and development process in LICs over the last quarter-century, ongoing changes in LICs and in the broader global economy will require the Fund to become more responsive if it is to remain relevant for LICs in the quarter-century that lies ahead. By the end of that period, half of the current LICs should graduate out of concessional finance and into emerging market status.

This chapter reviews the evolution of the IMF's financial engagement and policy support in LICs over the past quarter-century.<sup>1</sup> While program engagement constitutes the most intensive interaction a member country may have with the IMF, it is just one end of a much broader spectrum of engagement through which the Fund can support capacity building and policy formulation. In fact, IMF financial and policy support is framed by a broader role that encompasses surveillance of economic policies (notably, the regular Article IV consultation), provision of technical assistance to support policy development and institution-building, and on-the-ground representation in most program countries by Resident Representatives.

### The Origins of IMF Engagement

Prior to the mid-1970s, in a context of broadly satisfactory growth, inflation, and external performance, developing countries were expected to access IMF financial support in the same manner as richer countries. IMF-supported programs were designed to stabilize imbalances over a relatively short period of time, typically 12 to 24 months, and on nonconcessional financing terms.<sup>2</sup> With the advent of the oil price shocks and the sharp terms of trade movements of the late 1970s and early 1980s, however, it became increasingly clear that the IMF's traditional mechanisms for engagement were no longer appropriate (Figure 2.1).

After rising by 12 percent per year from 1970 to 1980, commodity prices dropped sharply in the early 1980s. Faced with a collapse of exports and government revenues, many LICs responded by increasing their external borrowing (Figure 2.2).

<sup>1</sup>See IMF (1993, 1998) and Boughton (2012), on which this chapter draws, for more comprehensive treatment.

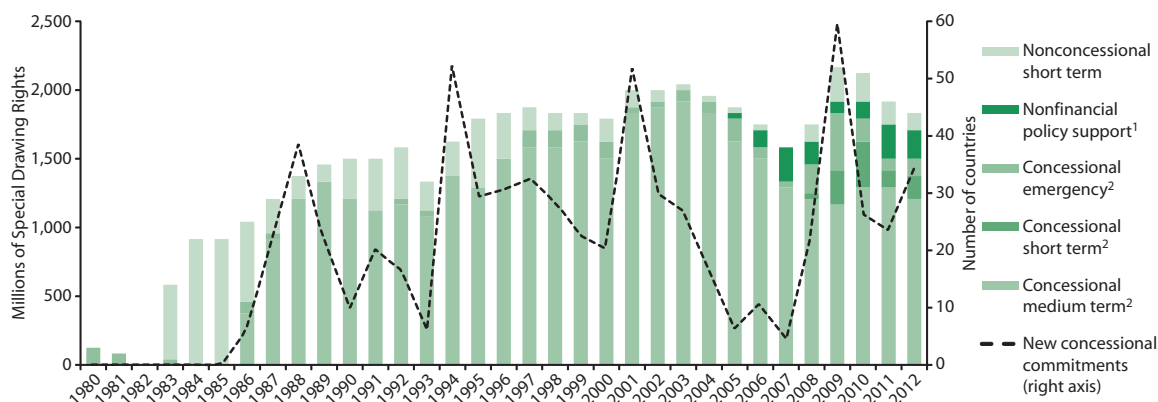
<sup>2</sup>Nonconcessional financing terms comprised a floating Special Drawing Right (SDR) interest rate and a short grace period and maturity.

With commodity prices remaining low, the large current account and fiscal deficits resulted in a rapid buildup of debt burdens, in many cases exacerbating already-existing problems of low savings, overvalued exchange rates, high government spending, and heavily regulated economies. With many official creditors willing to provide loans, including support for the countries' domestic industries, the 41 LICs that would later be considered for comprehensive bilateral and multilateral debt rescheduling saw their total indebtedness increase from \$60 billion in 1980 to \$105 billion in 1985 and \$190 billion in 1990. Many began to build up external payments arrears, or were able to avoid doing so only through debt rescheduling under the auspices of the Paris Club of official sector lenders.

In this context, the IMF's relatively short-term programs proved to be inadequate to address entrenched structural issues, and, in any case, the heavy external indebtedness of many LICs precluded their borrowing from the Fund on the usual non-concessional terms. The IMF therefore responded by introducing new facilities designed specifically for LICs: the Structural Adjustment Facility (SAF) in 1986, followed by the Enhanced Structural Adjustment Facility (ESAF) one year later. These facilities were designed to provide medium-term support through three successive annual programs. The financial support under the SAF and ESAF was provided on concessional terms,<sup>3</sup> funded by proceeds of earlier sales of IMF gold as well as grants from donors administered by the ESAF. The new facilities were based on the concept of protracted balance of payments needs in LICs. This indicated that the resolution of balance of payments problems would take place over a number of years due to the need to build institutional capacity and reduce dependence on aid.

The countries that sought support under the SAF and ESAF usually had worse initial conditions than

<sup>3</sup>A fixed interest rate of 0.5 percent, with repayments over 10 years and a grace period of 5½ years.

**Figure 2.1. Number of Low-Income Countries with an IMF Facility in Place, and New Concessional Commitments**

Source: IMF staff calculations.

Note: Each bar shows one facility per country, based on the length of use in the year and new commitments for countries eligible for IMF concessional financing (78 countries until 2009, and 72 countries afterwards).

<sup>1</sup> For countries with concurrent Policy Support Instrument and short-term financing, only the latter is counted: Senegal, 2008–12; Mozambique, 2009–10; and Tanzania, 2009–10 and 2012.

<sup>2</sup> Including blends.

LICs that did not seek medium-term support from the IMF (Figure 2.3). SAF- and ESAF-supported countries typically had accumulated deep-seated economic problems over an extended period, and came to the IMF in circumstances of persistently weak growth, often chronically high inflation, and fragile external positions. In the five years prior to the introduction of the SAF (1981–85), real per capita growth in subsequent ESAF countries averaged –1.1 percent, compared with 0 percent in non-ESAF developing countries. Savings rates in subsequent ESAF countries were half the average of other developing countries, and these countries had larger budget deficits, higher inflation, higher levels of external debt, more distorted foreign exchange systems, faster population growth, and more adverse social indicators.

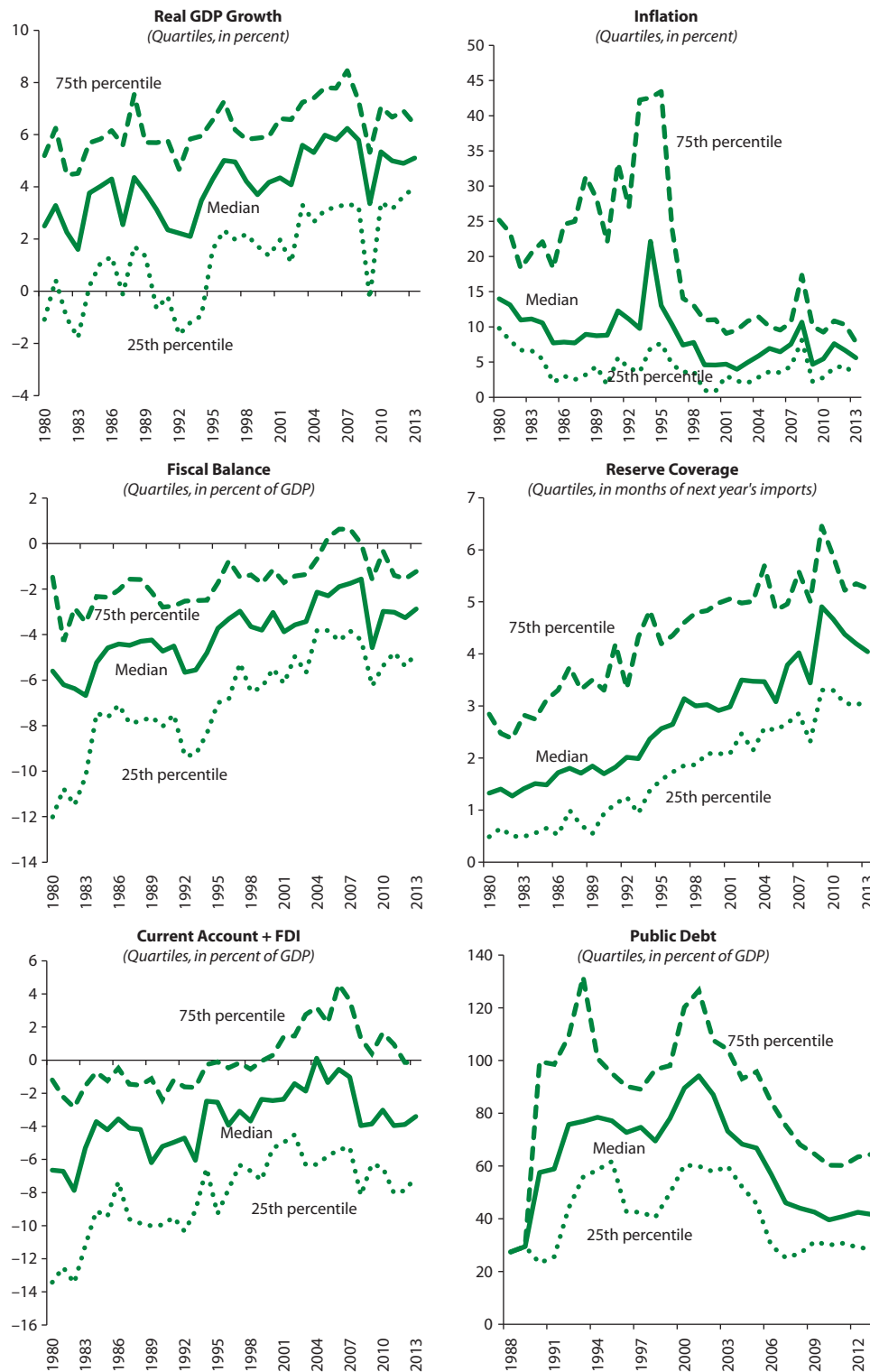
The core objectives of the ESAF were to promote external viability and higher output in a balanced manner by reducing domestic and external imbalances, mobilizing external resources, and improving resource allocation. The weak economic performance and structural characteristics of those countries that requested IMF and World Bank support were seen as necessitating a wide range of policy changes and reforms that became known as the “Washington Consensus” (Williamson, 1990). Policy reforms

typically encompassed attempts to streamline the public sector, reform and privatize public enterprises, reform or abolish marketing boards, and liberalize price controls and exchange and trade systems. Financial sector policies were often aimed at constraining credit growth, particularly to the public sector, while enhancing the role of market mechanisms in allocating credit.

Initially, IMF-supported programs in LICs had no explicit goal of poverty reduction. Moreover, there was not a systematic effort to assess the impact of Fund-supported programs on the poor. However, over time IMF-supported programs did begin to pay greater attention to the social dimensions of adjustment.<sup>4</sup> Many of the structural reforms themselves were instituted with the expectation that they would help to reduce poverty. Increases in agricultural producer prices and reforms of marketing boards, for example, sought to contribute to both higher production and the redistribution of economic rents back to poor farmers. Reduced inflation was also seen as supporting the poor, since they typically paid

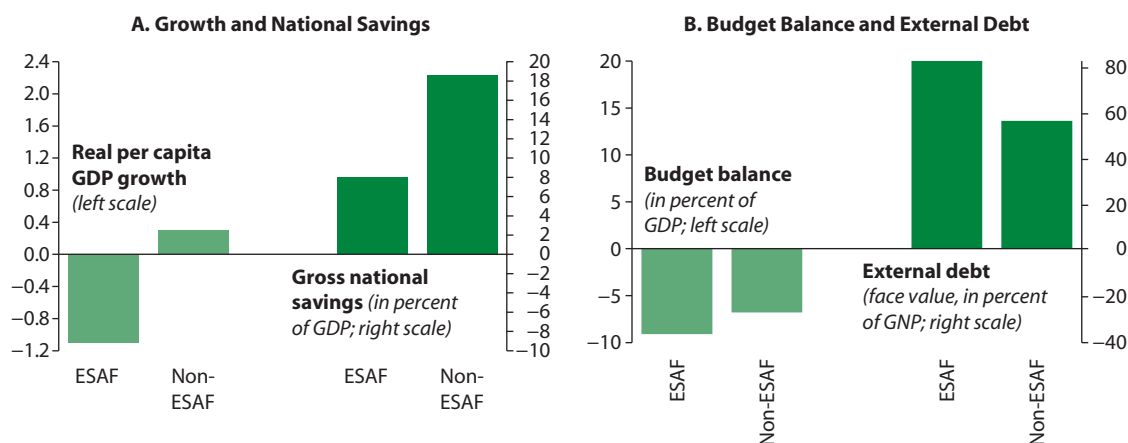
<sup>4</sup>In part this was a response to external analysis that emphasized the social costs of adjustment. See Cornea, Jolly, and Stewart (1987).

**Figure 2.2. Economic Performance of Low-Income Countries**



Source: IMF staff calculations using data from the IMF, World Economic Outlook database.  
 Note: The sample is composed of 75 low-income countries (LICs). FDI = foreign direct investment.



**Figure 2.3. Economic Performance of ESAF and Non-ESAF Low-Income Countries, 1981–85***(In percent)*

Sources: IMF, World Economic Outlook, International Financial Statistics databases; and World Bank.

Note: ESAF = Enhanced Structural Adjustment Facility.

a disproportionate share of the inflation tax. Where policies involved social costs, many programs made provision for compensation schemes and safety nets. In countries such as Bolivia, The Gambia, Senegal, and Uganda, where adjustment involved retrenchment of employment in the public sector, programs built in severance pay and/or retraining programs. In countries such as Bangladesh, Mozambique, and Sri Lanka, where subsidies on consumer items were reduced or abolished, programs often sought to introduce targeted compensation through such initiatives as income supplements and food distribution schemes.

Given the scale of the debt problems in many LICs, the restoration of external viability was difficult and arduous to achieve without comprehensive debt relief. However, prior to 1987, official creditors that accounted for the large majority of LIC debt had not supported any write-down in the value of their claims (Box 2.1). With support under the SAF and ESAF, countries were able to demonstrate adherence to a comprehensive stabilization framework, and on this basis could represent the need for external support in the form of debt relief. Once this principle that a reduction in the present value of the debt would be essential to restore sustainability was established, countries were able to request a series of increasingly concessional debt reschedulings with IMF support.

The fall of the Berlin Wall in 1989 and the dissolution of the Soviet Union in 1991 led to a rapid increase in the membership and work of the IMF.<sup>5</sup> The Fund played a significant role in supporting structural transformation in the countries of the former Soviet bloc as they transitioned from central planning to market-driven economies. (See Box 2.2 for the case of Georgia.) This was a difficult process, as the introduction of market mechanisms took place against a backdrop of price instability and a substantial decline in recorded output. Of the former Soviet Union countries, Armenia, Azerbaijan, Georgia, the Kyrgyz Republic, Moldova, and Uzbekistan became eligible for support from the IMF's concessional financing window, as did Albania, Bosnia and Herzegovina, and the former Yugoslav Republic of Macedonia in the Balkans.

While the ESAF had some success in supporting fiscal discipline and reducing external imbalances, the initial impact on growth was disappointing. Average real GDP per capita fell by 0.3 percent per year in the early 1990s in countries with ESAF programs. In part this reflected an unfavorable external environment for many LICs. During the late 1980s and early 1990s, most SAF/ESAF-supported

<sup>5</sup>In the course of three years IMF membership increased from 152 to 172 members.



### Box 2.1. Debt Relief

The initial approach of the international community to the debt problems that began to emerge in many low-income countries (LICs) during the early 1980s was to provide nonconcessional rescheduling of the debts falling due through the Paris Club, combined with the extension of new loans from official bilateral and multilateral creditors. As the decade unfolded, however, it became increasingly clear that these approaches were not addressing the fundamental issues of solvency.

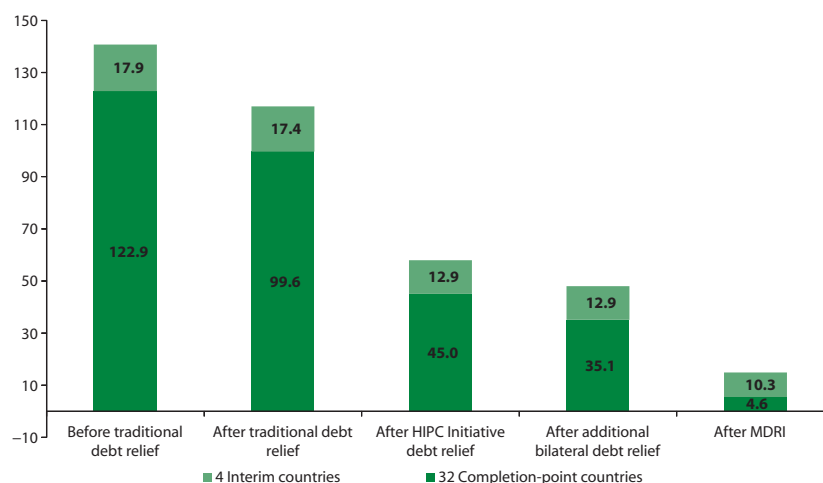
The series of increasingly concessional terms for rescheduling debt flows began with the Toronto terms in 1987. When they failed to restore external sustainability, the Paris Club introduced the Naples terms in 1994, under which the debt stock could be written down by two-thirds. However, traditional debt relief mechanisms still left the multilateral debts untouched and in many cases, even after Naples stock relief, debt levels remained elevated.

The Heavily Indebted Poor Countries (HIPC) Initiative was therefore launched in 1996 to provide comprehensive debt relief, and multilateral lenders including the IMF and World Bank began providing debt relief where necessary to reduce a country's debt burden to sustainable levels. However, initial progress was slow and insufficient in the view of nongovernmental organizations campaigning for comprehensive debt relief. In 1999, a review of the HIPC Initiative led to faster, deeper, and broader debt relief and strengthened the links between debt relief, poverty reduction, and social policies.

In 2005, to help accelerate progress toward the United Nations Millennium Development Goals, the HIPC Initiative was supplemented by the Multilateral Debt Relief Initiative (MDRI). The MDRI allowed for 100 percent relief on eligible debts by three multilateral institutions—the IMF, the World Bank, and the African Development Fund—for countries completing the HIPC Initiative process. In 2007, the Inter-American Development Bank also decided to provide additional (“beyond HIPC”) debt relief to the five HIPCs in the Western Hemisphere.

By 2012, 36 countries had received debt relief under the HIPC Initiative, and total debt relief committed under the initiative amounted to around US\$128 billion in nominal terms, of which about US\$51 billion was under the MDRI (Figure 2.1.1).

**Figure 2.1.1. Post-Decision-Point Debt Stock of Heavily Indebted Poor Countries at Different Relief Stages**  
(In billions of U.S. dollars in end-2010 present value terms)



Sources: World Bank; and IMF staff estimates.

Note: HIPC = Heavily Indebted Poor Countries; MDRI = Multilateral Debt Relief Initiative.

### Box 2.2. IMF Engagement in Georgia

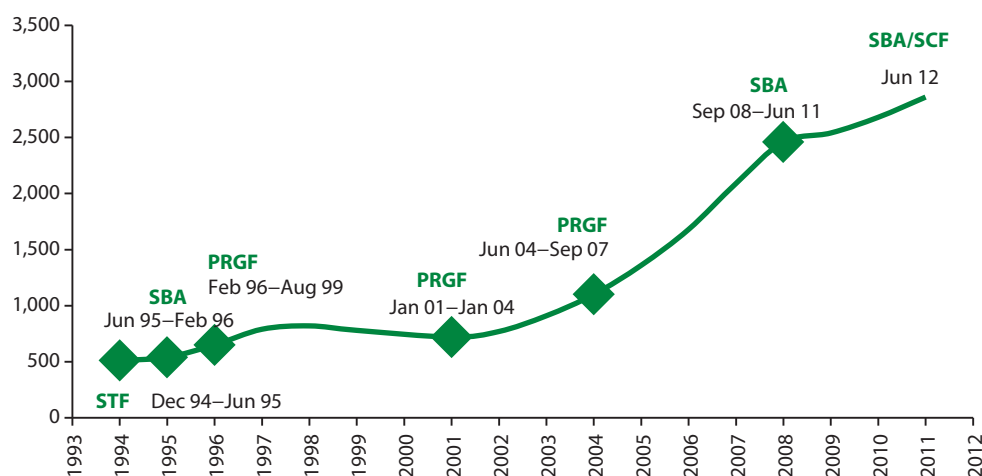
After the breakup of the Soviet Union in 1991, Georgia was beset by political instability and regional unrest, which was compounded by economic crisis. The country suffered a severe decline in output, hyperinflation, and a disintegration of public infrastructure. With the support of the IMF and World Bank, the authorities began to implement a comprehensive stabilization and structural reform program in mid-1994 aimed at halting hyperinflation, strengthening public finances, and establishing the necessary economic conditions for the resumption of economic growth (Figure 2.2.1).

In the decade that followed, Georgia was largely successful in attaining its stabilization goals under a number of IMF programs. Hyperinflation came to an end, and GDP, which had contracted severely from 1991 to 1994, started growing again in 1995. However, progress in many areas remained slow as policymakers were unable or unwilling to implement many of the structural and revenue measures. Widespread tax evasion undermined attempts to improve revenue mobilization, and program implementation was hampered by pervasive corruption, political fragmentation, and low institutional capacity.

Following the “Rose Revolution” of 2003, the new political leadership had strong ownership of the reform agenda and put in place policies that transformed the Georgian economy. Engagement with the IMF deepened, and the period that followed saw improved economic growth and strengthened revenue performance. With the support of IMF technical assistance, the revenue administration was reorganized and tax policy streamlined. The resulting increase in the tax-to-GDP ratio was significantly higher than expected and compared to country peers. Structural reforms paved the way for modernization of the economy with a more efficient public sector, and an economic and legal environment more conducive

**Figure 2.2.1. IMF Arrangements in Georgia**

(GNI per capita in current U.S. dollars)



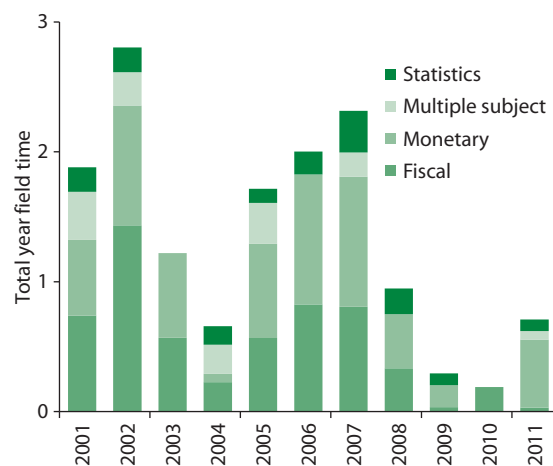
Source: IMF staff calculations.

Note: GNI = gross national income; PRGF = Poverty Reduction and Growth Facility; SBA = Stand-By Arrangement; SCF = Standby Credit Facility; STF = Systemic Transformation Facility.

**Box 2.2. (continued)**

to entrepreneurship. The new government undertook forceful measures to fight corruption, restored the financial and technical viability of the electricity sector, and launched an ambitious privatization program. IMF technical assistance also played an important role in the monetary, financial, and statistical areas (Figure 2.2.2).

With per capita income now well above the relevant threshold, Georgia recently graduated from access to concessional IMF financing. The Fund can still play an important role in Georgia by providing policy advice and supporting the completion of the adjustment process, while recently approved precautionary financial support helps guard against external vulnerabilities.

**Figure 2.2.2. IMF Technical Assistance to Georgia by Sector**

Source: IMF staff calculations.

countries saw a sizable deterioration in their terms of trade. The countries for which tea, coffee, or cocoa was the principal export—almost one-third of all ESAF users—suffered from a 60 percent drop in world beverage prices between 1986 and 1992. Other nonfuel commodity prices weakened from 1988 through the advanced economy recession of 1991–93. A number of countries continued to suffer from political instability, which also undermined growth. (See Box 2.3 for the case of Rwanda.)

In the latter half of the 1990s, however, the external environment improved for all LICs, and for the first time the growth performance of LICs in longer-term IMF-supported programs equaled that of nonprogram LICs. Nevertheless, at 1.6 percent per year, average per capita growth in the late 1990s remained lower than what was needed in many countries to achieve significant reductions in the poverty rate and improvements in social indicators, including health and education. Furthermore traditional debt relief mechanisms through the Paris Club, though increasingly concessional, were proving unable to restore debt sustainability even in

well-performing LICs, suggesting that a new approach was necessary.

**Strengthened Focus on Poverty Reduction**

In 1999, after more than two years of internal and external debate, the IMF replaced the ESAF with the Poverty Reduction and Growth Facility (PRGF) (Table 2.1). This was part of a broader overhaul of the international development architecture—called for by many nongovernmental organization campaigners, LICs themselves, and development practitioners—that put country ownership and poverty reduction squarely at the center. As part of this reform, it was envisaged that the overall macroeconomic framework for PRGF arrangements would be drawn from a country's own poverty reduction strategy, as set out in its Poverty Reduction Strategy Paper. Conditionality would be more selective and focused on actions that are critical to achieving the program's macroeconomic objectives (Box 2.4). Fiscal targets would make appropriate allowance for increases in public expenditure to support a country's Poverty Reduction Strategy.

**Box 2.3. IMF Engagement in Rwanda**

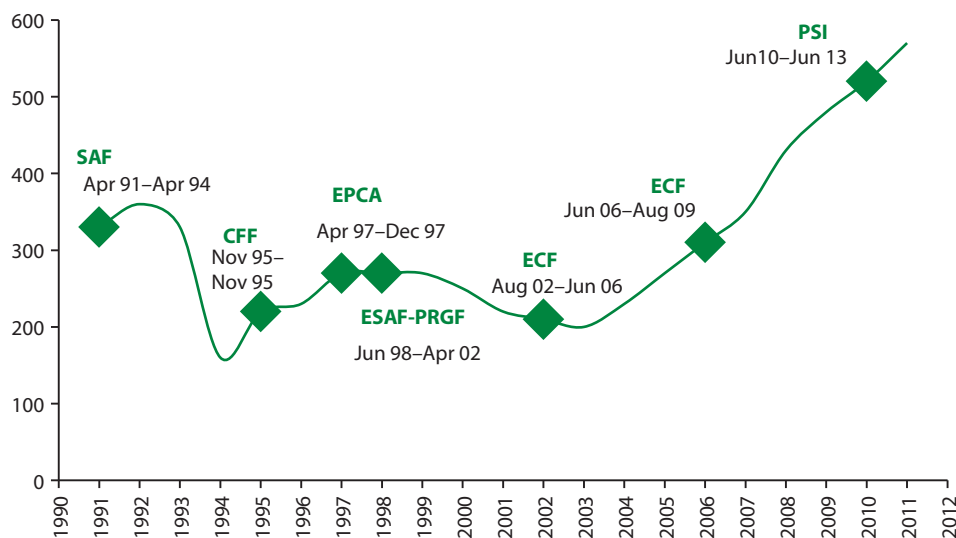
The 1994 conflict in Rwanda, which killed 800,000 people and displaced about 2 million, also inevitably had consequences for development and resulted in a “lost decade” for growth, with GDP declining by 1.4 percent per year on average over 1990–2000. The IMF reengaged in Rwanda in 1995 and has had continuous program engagement ever since (Figure 2.3.1).

During the period from 1995 to 2006, efforts were directed to rebuilding the country and restoring the functioning of the state. Rwanda undertook an impressive national rehabilitation plan with the strong support of the international community. Alongside the crucial objective of reestablishing national peace and dialogue, the macroeconomic agenda focused on institutional capacity-building for growth and poverty reduction. The IMF supported the implementation of structural reforms in key areas such as strengthening the National Bank of Rwanda, establishing a public revenue authority in 1998, and introducing a value-added tax in 2000.

By 1999, economic activity had recovered to its 1993 level, while inflation had been drastically reduced and official reserves reconstituted. The progress continued in the 2000s with debt relief obtained under the completion point of the Heavily Indebted Poor Countries Initiative in 2005, and with education and health spending experiencing significant upward trends. Results from the latest household expenditure survey show that robust economic growth led to a fall in the poverty headcount ratio from 56.7 percent in 2005/06 to 44.9 percent in 2010/11.

Rwanda has recently transitioned from IMF financing to a nonfinancial relationship (using the Policy Support Instrument), under which the authorities envisage strengthening domestic revenue mobilization to offset a gradual decline of external grants, and promoting economic diversification.

**Figure 2.3.1. IMF Arrangements in Rwanda**  
(GNI per capita in current U.S. dollars)



Source: IMF staff calculations.  
 Note: CFF = Compensatory Financing Facility; ECF = Extended Credit Facility; ESAF = Enhanced Structural Adjustment Facility; EPCA = Emergency Post-Conflict Assistance; GNI = gross national income; PSI = Policy Support Instrument; SAF = Structural Adjustment Facility.

**Table 2.1. Evolution of Eligibility for IMF Concessional Financing**

	Entrants			Graduates						
1995	Eritrea	Azerbaijan	Congo, Rep. of	St. Kitts and Nevis	Dominican Republic	Philippines				
1996	Bosnia and Herzegovina									
1997–98										
1999	Moldova									
2000				China	Equatorial Guinea	Egypt				
2001–02										
2003	Papua New Guinea	Timor-Leste	Uzbekistan	Macedonia, FYR	Bosnia and Herzegovina					
2004–09										
2010				India	Pakistan	Sri Lanka	Albania	Angola	Azerbaijan	
2011										
2012	South Sudan									

Source: Prepared by IMF staff.

**Box 2.4. IMF Program Conditionality**

All IMF programs involve conditionality, the purpose of which is to safeguard the Fund's resources by ensuring that the program is successful—that is, the borrowing country's balance of payments improves sufficiently that the country is able to repay the loan. Until the early 1980s, IMF conditionality tended to be limited and focused on macroeconomic policies. However, as the Fund became increasingly involved in low-income countries and transition economies in the late 1980s and 1990s, the complexity and scope of structural conditions increased. IMF programs sought to address the severe structural problems that were seen as hampering economic stability and undermining the potential for growth. The number of prior actions, performance criteria, and indicative targets in IMF-supported programs increased correspondingly.

In the 2000s, however, the IMF sought to return to a more focused approach to conditionality. The 2002 guidelines, introduced following a major review, entrenched the principal of parsimony in the use of conditions, and reaffirmed that member countries have primary responsibility for selecting, designing, and implementing the policies that will make the IMF-supported program successful. All conditionality under an IMF-supported program must be “macro-critical”—that is, critical to the achievement of the program's macroeconomic program goals—and must be tailored to a country's individual circumstances.

In 2007, the IMF moved away from setting conditions on the size of the government wage bill. This departure reflected the institution's view that the use of medium-term expenditure frameworks and strengthened budget and payroll systems would gradually obviate the need for such ceilings. Program design focused on overall spending and priority spending, leaving specific decisions on spending allocations to country authorities.

In March 2009, the IMF further modernized its conditionality framework. Structural performance criteria, which required formal waivers for a review to be completed if they were not met, were abolished. Structural reforms are now assessed by reviews of overall program performance, and more IMF-supported programs make use of *ex ante* conditionality. This approach emphasizes achievement of the underlying objectives of the reforms, while giving countries more room for maneuver in how the reforms are implemented.

Against a backdrop of rising public pressure in developed countries to increase and improve financial support to low-income countries, creditors also resolved to make greater efforts to restore debt sustainability and fiscal space in LICs by providing comprehensive debt relief. Under the Heavily Indebted Poor Countries (HIPC) Initiative, multilateral debt could for the first time be written down, including debts owed to the IMF itself. To ensure that debt relief was put to good use, a country had to establish a successful track record under IMF-supported programs, and have a Poverty Reduction Strategy in place through a broad-based participatory process.

The new architecture coincided with a period of unusually favorable global trends. Together with strengthened macroeconomic policymaking in LICs and a more supportive aid environment, this led to GDP growth in most LICs at levels not seen since the 1970s. Other macroeconomic indicators also improved considerably during this period. From 2003 to 2005 compared to the 1980s and 1990s, government revenues as a percentage of GDP were 5 percent higher, foreign direct investment (FDI) as a share of GDP doubled, and the reserve coverage of imports increased by 50 percent. Most importantly, the improved macroeconomic performance began to feed through to significant progress in poverty reduction in many countries. Moreover, several countries moved to low-access PRGFs, as financing needs declined, while continued program engagement was sought to support macroeconomic policies and catalyze donor flows to help boost growth and reduce poverty. Progressively, countries started to graduate from IMF concessional support.

In 2005, the IMF approved the Multilateral Debt Relief Initiative (MDRI) to provide significant further debt reduction beyond the HIPC Initiative, and the Fund also established two new modes of engagement: (1) the Policy Support Instrument (PSI) to provide policy support and signaling for “mature stabilizers,” that is, those countries that had attained external and domestic macroeconomic stability such that they no longer needed continuous Fund financial assistance; and (2) the Exogenous Shocks Facility (ESF) to provide rapid assistance in the event of an exogenous shock for countries without a PRGF arrangement in place.

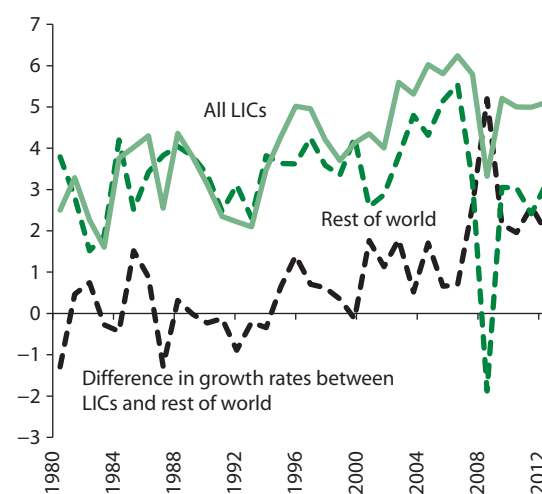
## The Global Financial Crisis and the IMF’s Response

The supportive external environment that had characterized the mid-2000s came to an end in 2007–08. A surge in food and fuel prices weakened trade balances and official reserves positions for most LICs except oil exporters. This prompted the need for increased social spending to mitigate the impact on the poorest, for whom food costs already constituted a large proportion of expenditure. The food and fuel crisis had just begun to abate when the collapse of Lehman Brothers heralded the escalation of the global financial crisis.

While the crisis originated in the advanced economies, it was soon transmitted to LICs through several major channels: demand for their exports dropped, foreign exchange markets grew more volatile, trade finance and other forms of credit tightened, and FDI and remittance flows slowed. The global gloom and uncertainty cast a chill over domestic investment as well. Global GDP growth, which had been running at 3–4 percent in the mid-2000s, fell below 1 percent (Figure 2.4).

**Figure 2.4. Real GDP Growth, 1980–2012**

(Median, in percent)



Source: IMF staff calculations using data from IMF, World Economic Outlook database.

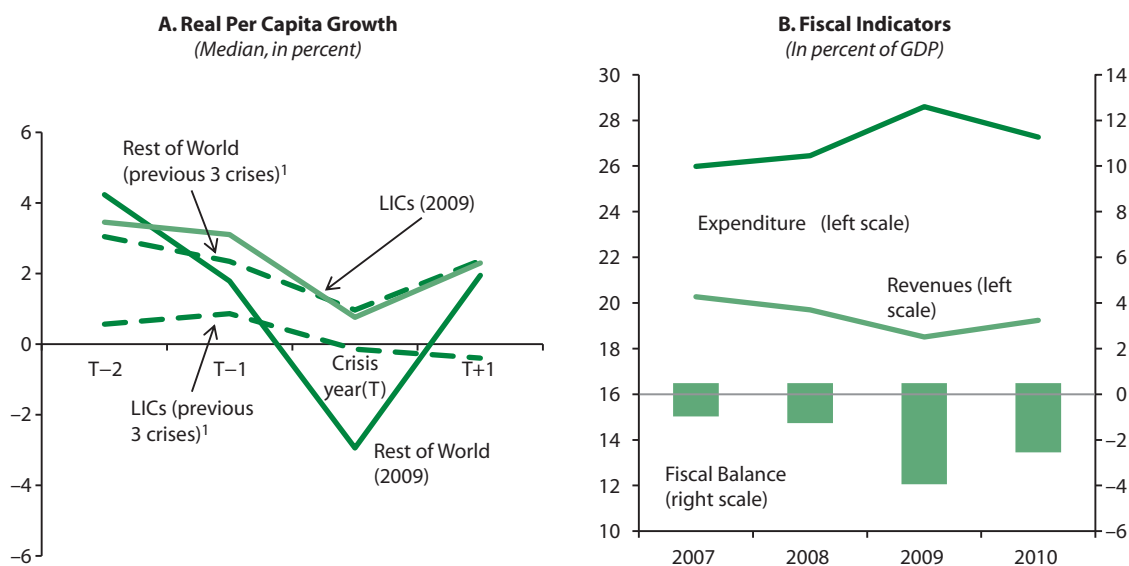
Note: LICs = low-income countries.

The IMF responded to the crisis by advocating and supporting a vigorous countercyclical fiscal response in many LICs. This largely reflected the improved macroeconomic position of LICs themselves. Official reserves in the typical low-income country were about double their level at the start of earlier crises. Inflation rates, fiscal deficits, current account deficits, and external debt levels stood at about half of where they were at the start of earlier crises (Figure 2.5). During earlier crises, such as in 1982 and 1991, LICs had cut their fiscal deficits. In 2009, the typical LIC increased its fiscal deficit by 2.7 percent of GDP. Real spending rose 7 percent. While more than half of the financing needs resulting from the higher fiscal deficits were met from domestic sources, external creditors also stepped in to provide large amounts of concessional and other financing.

The IMF itself was able to play a significant role in providing this external financing and policy support thanks to a major overhaul of its facilities. The evolution of the Fund’s support instruments for LICs had left some gaps in the toolkit, and

also created a number of overlaps (Table 2.2). The three major missing elements were (1) fully flexible short-term financing, since use of the ESF–High Access Component (HAC) was limited to shocks with exogenous causes; (2) a concessional precautionary instrument; and (3) flexible emergency financing. Emergency assistance was available for LICs under three different instruments: Emergency Natural Disaster Assistance (ENDA) for LICs hit by natural disasters; the ESF–Rapid Access Component (RAC) for LICs affected by exogenous shocks; and Emergency Post-Conflict Assistance (EPCA) for LICs emerging from conflict. But the Fund lacked a streamlined tool to provide rapid emergency assistance for urgent balance of payments needs, irrespective of their cause. Moreover, access levels had severely eroded over the preceding decade, and access policies were not consistent across instruments. These factors had contributed to an increasing number of LICs reverting once more to Stand-By Arrangements (SBAs), which are nonconcessional and thus generally not an appropriate form of financing for LICs.

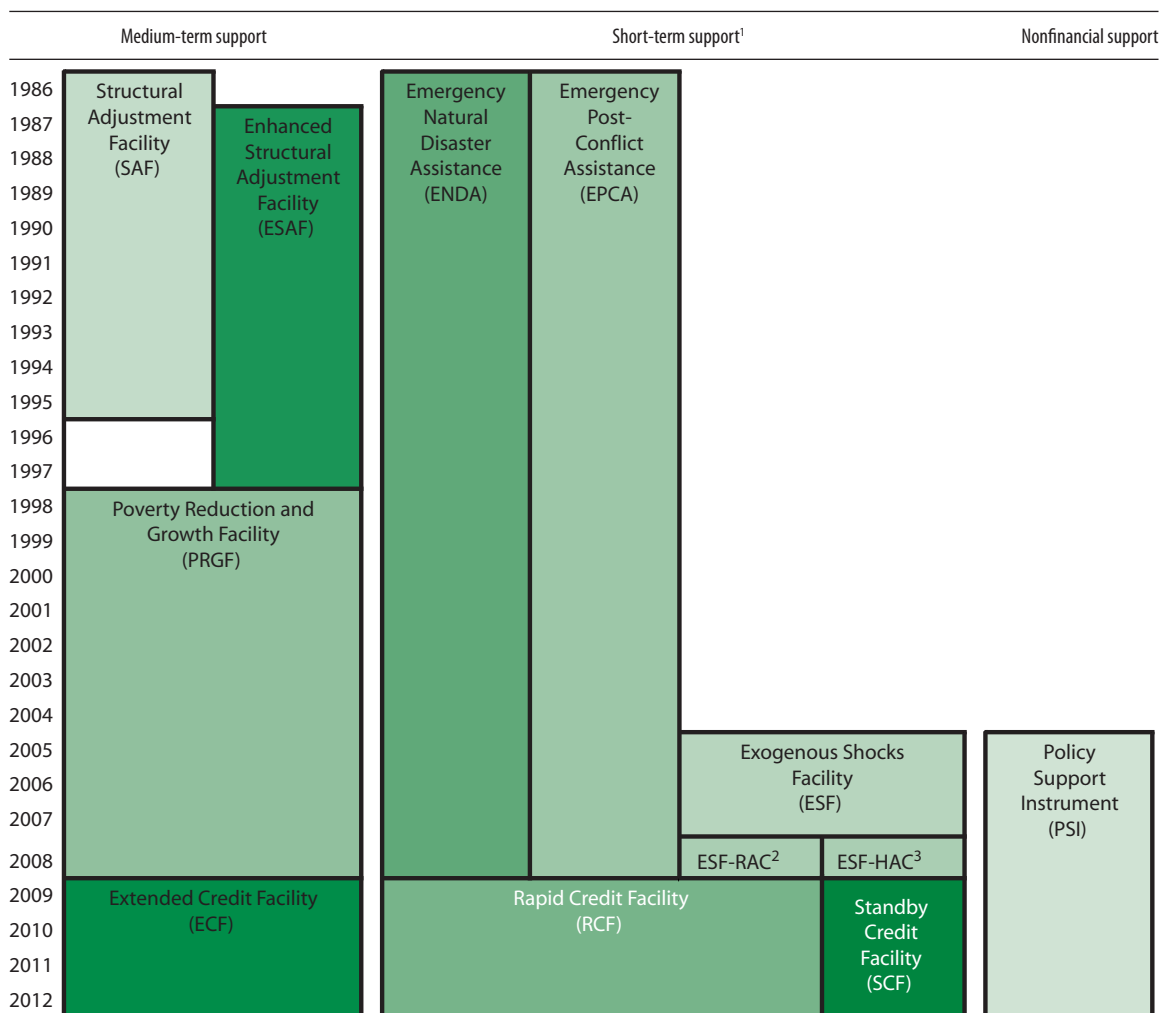
**Figure 2.5. Real Per Capita Growth and Fiscal Indicators**  
(In percent)



Sources: IMF, World Economic Outlook database; and IMF staff estimates.  
Note: LICs = low-income countries; LHS = left-hand scale; RHS = right-hand scale.  
<sup>1</sup> Previous crises are 1975, 1982, and 1991.



**Table 2.2 Evolution of the IMF’s Concessional Facilities**



Source: Prepared by IMF staff.

<sup>1</sup>The RCF and SCF reduced overlaps and closed gaps between facilities.

<sup>2</sup>Exogenous Shocks Facility—Rapid Access Component.

<sup>3</sup>Exogenous Shocks Facility—High Access Component.

The 2009 reforms created a new architecture of concessional facilities aimed at providing more flexible and tailored support to meet the diverse needs of LICs. The Extended Credit Facility (ECF) replaced the PRGF as the main tool for addressing protracted balance of payments problems. The Standby Credit Facility (SCF) was created to provide support to LICs with short-term balance of payments needs, akin to that provided under SBAs, with the possibility of using it on a precautionary basis. The Rapid Credit Facility (RCF) was created to provide rapid low-access financing with

limited conditionality to meet urgent balance of payments needs, widening the scope of emergency assistance to cover needs arising from domestic factors and streamlining existing emergency instruments used by LICs (ENDA, EPCA, and ESF-RAC) under one facility. The PSI was kept largely unchanged.

Interest rates were reduced to zero on all concessional facilities as a temporary measure in response to the crisis—a measure that has been extended through end-2014. Access levels were doubled, and new access limits and norms were designed to ensure



consistency across the three facilities.<sup>6</sup> Other modalities were made more flexible, including the debt limit policy and structural conditionality.

In addition, the international community endorsed a financing package to more than double the IMF's concessional lending capacity to SDR 11.3 billion (\$17 billion) for the period from 2009–14. Most of the additional subsidy resources were mobilized from the Fund's internal resources, including those linked to gold sales, but they also include new bilateral contributions. Also, the general and special SDR allocations agreed upon during the height of the crisis provided more than SDR 8 billion (\$12 billion) to bolster LICs' foreign exchange reserves and help alleviate financing constraints during the crisis.<sup>7</sup>

With the new architecture and financing in place, the IMF was able to quadruple disbursements to LICs in 2009 and support their countercyclical fiscal policies. As a result, countries were able to maintain their planned increases in expenditures and preserve valuable social spending at a time when it was most necessary. Unlike in advanced economies, where per capita income fell, per capita income growth remained positive in LICs.

In contrast to previous crises, the post-2009 recovery in LICs has been swift and synchronized with the rest of the world, reflecting strong export demand from trading partners. While advanced economies still account for a large share of LICs' trading partners, a number of fast-growing emerging markets have played an increasing role

in supporting growth in LICs. In addition to the usual trade channels, through which higher growth in emerging markets contributes to a rise in demand for LIC exports, some emerging markets have become major contributors to LIC growth more recently through remittances, FDI, and other financial linkages. Driven also by strong growth in domestic demand, real GDP growth for the median LIC is projected to grow at around 6 percent over the next five years, following the strong performance in 2011–12.

However, despite this strong growth performance, vulnerabilities remain elevated in LICs, suggesting the potential need for continued strong IMF support over the medium term. Though LICs started to rebuild policy buffers as their recovery began in 2010, progress on this front has halted and even been partially reversed over the past two years. As a result, many LICs have more limited fiscal space and larger current account deficits than prior to the crisis.

To summarize, over the course of the last quarter-century the IMF has had intensive program engagement with a significant proportion of LICs, as well as nonprogram engagement through surveillance and technical assistance with many more. Over this same time frame most LICs have made solid, if at times uneven, progress in liberalizing and diversifying their economies. The next chapter attempts to assess the role of the IMF in this process, and proposes new techniques to advance the existing methodologies for estimating program impact.

<sup>6</sup>Access limits determine the maximum amount of assistance the Fund can provide to each country, while access norms provide an indication of the usual amount of assistance each country could expect to receive, which could be increased or decreased if merited by a country's individual program or needs.

<sup>7</sup>An SDR allocation effectively increases members' international reserves, since it represents a potential claim on hard currency, thereby allowing members to reduce their reliance on more expensive domestic or external debt for building reserves.

While there is a large literature on the macroeconomic consequences of IMF-supported programs, country samples have varied significantly across studies, and very few papers have focused exclusively on LICs. However, regardless of the country sample, the main challenge of these studies has always been the treatment of the endogeneity/self-selection issues related to the participation in IMF-supported programs, and the identification of relevant macroeconomic outcomes of such programs. Initial economic conditions differ systematically between program and nonprogram countries. Countries that approach the IMF often do so because they are already facing economic difficulties. Structural vulnerabilities such as commodity dependence or poor governance may also lead to longer-term use of Fund facilities, and may result in increased exposure to shocks and a decreased ability to implement appropriate macroeconomic policies in the face of these shocks.

If econometric estimations of the impact of IMF-supported programs ignore these systematic differences between program and nonprogram countries, the estimated effect of the Fund's engagement on growth and other macroeconomic indicators will likely be biased. In order to disentangle the different factors—and, hence, isolate the specific contribution of IMF engagement—many studies begin by attempting to assess the determinants of countries' participation in IMF-supported programs.<sup>1</sup> While early research emphasized the economic determinants, the low predictive capacity of these models increasingly led researchers to include political variables that would affect the “supply” side of programs.<sup>2</sup> Evidence

on the significance of these factors is again mixed.<sup>3</sup> Steinwand and Stone (2008, p. 129) conclude that “the variety of models used to explain participation in IMF programs and the plethora of contradictory results they produce indicates that existing models are far from definitive. This unfinished business is the strongest reason to urge caution in rushing to judgment about the effects of IMF lending.”

Recently, two studies analyzed the determinants of LIC participation in IMF-supported programs. Bird and Rowlands (2009) report significant differences between the specifications for low- and middle-income countries, though results for the LIC specification are weak.<sup>4</sup> Bal Gündüz (2009) focuses on a specific subset of IMF arrangements with LICs that addresses policy and exogenous shocks and reports various economic variables as being statistically significant. While the literature has primarily focused on explaining the participation in IMF-supported programs in any given year, a few studies look into factors behind the prolonged use of Fund resources.<sup>5</sup> Overall, this limited literature suggests that repeated use is peculiar to LICs and explained by both economic and structural variables.

The large empirical literature has reached some consensus that IMF-supported programs are associated with significant improvement in the balance of payments and have some effect on inflation, but results are mixed regarding the impact on growth (Table 3.1). A few observations are noteworthy: (1) most of the previous research examines only non-concessional programs; (2) only a few studies explore the impact of prolonged engagement on long-term

<sup>1</sup>See Bird (2007) and Steinwand and Stone (2008) for comprehensive surveys.

<sup>2</sup>Andersen, Hansen, and Markussen (2006), Barro and Lee (2005), Oatley and Yackee (2004), Dreher, Sturm, and Vreeland (2006), Dreher and Jensen (2007), Stone (2002, 2004), and Presbitero and Zazzaro (2012) explore the impact of various political variables, including the size of governments, quotas at the IMF, various instruments for U.S. and European influence, and the number of veto players.

<sup>3</sup>Although some individual political factors appear to be significant, they do not significantly improve the predictive power of models (Bird and Rowlands, 2001).

<sup>4</sup>Only three variables are significantly related to participation in IMF arrangements in LICs—previous Fund arrangements, high inflation, and the rescheduling of debt—and explanatory power vis-à-vis middle-income countries is weaker.

<sup>5</sup>Bird, Hussain, and Joyce (2004), Conway (2007), Joyce (2005), and Independent Evaluation Office (2002).

**Table 3.1. Summary of Literature on the Impact of IMF-Supported Programs, 2000–12**

Outcome variables	GDP		Fiscal	Current account	Monetary	Gini	Education	Health	Poverty	Period	Countries	Type of programs	Selection correction	Method
	growth	Inflation	deficit	balance	growth	coefficient	spending	spending						
Bordo and Schwartz (2000)	–	+		+						1973–1998	14 emerging markets	SBA EFF	No	
Dicks-Mireaux, Mecagni, and Schadler (2000)	+*	–								1986–1991	61 LICs	ESAF	No	
Garuda (2000)						+*/–* <sup>a</sup>				1975–1991	39 countries	Mixed	Yes	PSM
Przeworski and Vreeland (2000)	–*									1970–1990	79 countries	Mixed	Yes	Heckman
Evrensel (2002)	+* <sup>b</sup>	–		+*	+/-					1971–1997	91 countries	Mixed & by program	No	
Hardoy (2003)	–									1970–1990	109 developing countries	Mixed	Yes	PSM PSM (DID)
Hutchison (2003)	–*									1975–1997	67 countries	SBA EFF	Yes	Heckman <sup>c</sup>
Vreeland (2003)	–*									1961–1993	110 countries	Mixed	Yes	Heckman
Dreher and Vaubel (2004)			–*		–*					1975–1997	94 countries	Mixed	No	
Hutchison (2004)	+									1975–1997	25 emerging markets	SBA EFF	Yes	PSM Heckman
Independent Evaluation Office (2002)	+*/– <sup>d</sup>									1975–1999	82 prolonged versus temporary users	Mixed & by program	Yes	IV
Barro and Lee (2005)	–*									1975–1999	130 countries	SBA EFF	Yes	IV
Butkiewicz and Yanikkaya (2005)	–*									1970–1999	100 developing countries	Mixed	Yes	IV
Easterly (2005)	0 <sup>e</sup>		–		–					1980–1999	20 repeated users	Mixed	Yes	IV <sup>f</sup>
Atoyan and Conway (2006)	+/-		–*	+*						1993–2002	95 developing countries	Mixed	Yes	PSM Heckman
Dreher (2006)	–*									1970–2000	98 developing countries	SBA EFF	Yes	IV
Nooruddin and Simmons (2006)							–*	–*		1980–2000	98 countries	Mixed	Yes	
Eichengreen, Gupta, and Mody (2008)	–*									1980–2003	24 countries with sudden stops	SBA EFF	Yes	Heckman
Marchesi and Sirtori (2011)	–* <sup>g</sup>									1982–2005	128 developing countries	Mixed	Yes	IV
IMF (2012d) <sup>h</sup>	– <sup>i</sup>	–	+		0					2002–2011	44 MICs	SBA EFF	Yes	PSM
Clements, Gupta, and Nozaki (2013)							+*	+*		1985–2009	LICs and MICs	Mixed & by program	Yes	
Oberdabernig (2013)						+* <sup>j</sup>			+* <sup>j</sup>	1982–2009	LICs and MICs	Mixed	Yes	IV

Source: Draws on Steinwand and Stone (2008), expanded by authors to include selected key aspects of previous studies as well as recent literature.

Note: DID = difference-in-difference; EFF = Extended Fund Facility; ESAF = Enhanced Structural Adjustment Facility; Heckman = Heckman two-step estimator for correcting selection bias; IV = instrumental variable estimator; LICs = low-income countries; MICs = middle-income countries; PSM = Propensity Score Matching; SAF = Structural Adjustment Facility; SBA = Stand-By Arrangement. +\* Significantly positive; –\* Significantly negative; + Positive but nonsignificant; – Negative but nonsignificant; 0 Very close to zero.

<sup>a</sup> Countries with low propensity scores show improvement, while for those with high propensity scores inequality deteriorates.

<sup>b</sup> Significant only for SAF/ESAF, positive but nonsignificant in mixed sample.

<sup>c</sup> This study applies Heckman correction to growth equation, however, the inverse Mills ratio (IMR) turns nonsignificant. The author notes that his participation equation is not strong. Therefore, it is difficult to know whether the nonsignificance of the IMR is because a stable participation equation is not identified or participation is random.

<sup>d</sup> Finds significant negative effect for prolonged users only, while the impact on growth is nonsignificant for temporary users.

<sup>e</sup> Results from IV regressions are very close to zero.

<sup>f</sup> Easterly (2005) notes that his instruments are weak.

<sup>g</sup> They report a significantly positive impact from the interaction of IMF and World Bank programs.

<sup>h</sup> Based on descriptive comparison vis-à-vis the control group constructed by the PSM, therefore, significance level is not reported.

<sup>i</sup> Positive effect is reported for years following the initiation of programs.

<sup>j</sup> The findings are reversed for the period 2000–09 with IMF programs leading to lower poverty and lower inequality.

growth;<sup>6</sup> (3) although the literature widely acknowledges that whether IMF-supported programs are fully implemented or not is a key issue in properly assessing their impact, most studies do not take into account compliance with programs;<sup>7</sup> and (4) correcting for selection bias has become a standard component of the analysis only more recently, with most studies having applied either the Heckman two-stage methodology or instrumental variable (IV) regressions.<sup>8</sup>

The use in the earlier literature of the Heckman two-step approach and the IV strategy faced the principal challenge of identifying exclusion restrictions, namely, variables that appear in the selection equation but not necessarily in the structural model (for example, a low level of reserves would increase both the likelihood of IMF-supported programs and the need for adjustment, resulting in a negative impact on growth should an adverse exogenous shock materialize).<sup>9</sup> The more recent literature builds on techniques borrowed from the microeconomic impact evaluation literature. Under this approach, each IMF-supported program-country observation is matched to a counterfactual nonprogram-country observation with a similar predicted probability of having a program, and their macroeconomic outcomes are then compared. Using this technique, Atoyán and Conway (2006) found little statistical support that IMF-supported programs contemporaneously improve real economic growth in participating countries (though the programs did improve the fiscal and current account balances), but found

stronger evidence of an improvement in economic growth in years following a program.

The analysis in this paper contributes to the existing empirical literature on the impact of IMF-supported programs in at least four ways:

- It focuses exclusively on LICs, motivated by the fact that they present unique characteristics that set them apart from other countries as discussed in Chapter 2.
- It studies two homogenous and complementary subsets of IMF-supported programs with LICs (medium-term prolonged support versus short-term episodic support) not examined by the earlier research. This level of disaggregation significantly improves the identification of economic and structural factors in participation models, which is the key step to correct for selection bias, but also makes it possible to distinguish between short-run effects and effects of prolonged use of IMF facilities for LICs.
- Based on a sample covering nearly three decades and ending in 2010, it examines a wide range of macroeconomic and social outcomes using the Propensity Score Matching (PSM) methodology, previously implemented only by a handful of studies for a few outcome indicators and for a mixed sample of countries, to correct for selection bias.
- Finally, the paper investigates a few potential channels of transmission through which longer-term IMF engagement can affect long-term growth and distinguishes between effects due to IMF financing versus the role of its policy advice and capacity development.

### Impact of Longer-Term IMF Engagement in Low-Income Countries

As noted in Chapter 2, macroeconomic conditions have improved substantially over the last two decades for most LICs, regardless of whether they were engaged with the IMF.<sup>10</sup> On average, LICs

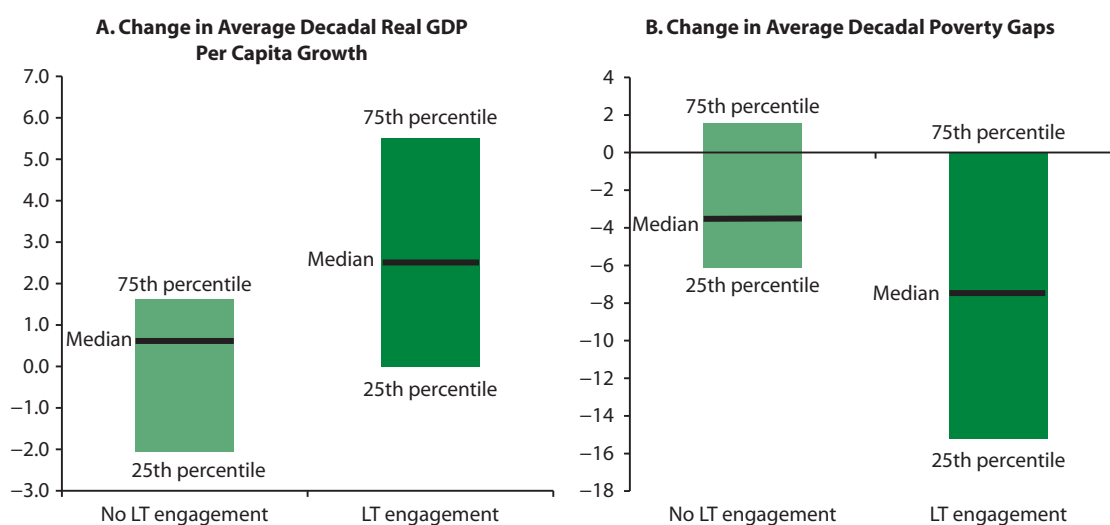
<sup>6</sup>Barro and Lee (2005), Dreher (2006), and Independent Evaluation Office (2002).

<sup>7</sup>Mercer-Blackman and Unigovskaya (2000) report a positive association between growth and compliance in transition economies. Dreher (2006) finds that increased compliance reduces the negative impact of programs on growth.

<sup>8</sup>For early studies Ul Haque and Khan (1998) conclude that those that do not correct for selection bias (before-after and with-without approaches) yield less-favorable results compared to studies using the Generalized Evaluation Estimator (GEE). However, Dicks-Mireaux, Mecagni, and Schädler (2000) largely discredit the validity of the GEE owing to many restrictive assumptions necessary to define the counterfactual based on policy reaction functions.

<sup>9</sup>Barro and Lee (2005) is a prominent example of this literature strand.

<sup>10</sup>The country sample comprises up to 75 of the 78 countries that were eligible to receive the IMF's concessional support as of January 1, 2010. Timor-Leste, Somalia, and Tonga were excluded because of severe lack of data.

**Figure 3.1. Changes in Average Decadal GDP Per Capita Growth and Poverty Gaps, 1986–2010***(In percent)*

Source: IMF staff calculations using World Bank data.

Note: The sample is composed of 75 low-income countries and four overlapping decadal period averages: 1986–95; 1991–2000; 1996–2005; and 2001–10. A country is considered to have longer-term (LT) engagement in a given decade if in five or more years it had a financial arrangement or a Policy Support Instrument in place, for at least six months in each of these years. The figure shows the distribution of decadal changes across countries by quartiles. Poverty gap is defined as the mean shortfall from the poverty line (counting the nonpoor as having zero shortfall), expressed as a percentage of the poverty line. A more negative change in the figure implies a bigger reduction in the poverty gap.

experienced significant long-term increases in real GDP per capita growth, government balances, reserves, current account balances, FDI, exports, institutional quality, and social spending, while also achieving noticeable reductions in economic volatility, inflation, external debt, inequality, and poverty (Figure A2.1). This finding holds across country sizes (small versus non-small economies), geographical groupings (coastal versus land-locked), institutional capacity (as measured by the World Bank's Country Policy and Institutional Assessment—CPIA), and per capita income (Figure A2.2).

LICs with extensive IMF-supported program engagement have experienced, on average, a comparatively strong improvement in longer-term economic performance. Looking at the past three decades, countries with extensive program engagement faced comparatively weaker initial economic conditions in the 1980s, and experienced on average larger increases in real GDP per capita growth, government balance, exports, FDI, and social spending

than countries without such extensive engagement.<sup>11</sup> LICs with longer-term program engagement also achieved a more marked reduction in economic volatility, inflation, and external debt. This stylized fact was first reported in IMF (2009) and continues to hold after updating the data to include the most recent years covering the global financial crisis. The strong economic improvement among extensive program users has largely eliminated the performance gap that existed relative to other LICs around the time when the ESAF was created in 1987. Figures 3.1 and A2.3 show a similar result when looking at the change in decadal averages of economic indicators and splitting the country sample into LICs with longer-term engagement (at least five years within the later decade) and those without such engagement.

<sup>11</sup>While the current account for LICs with longer-term IMF engagement seems to have deteriorated over the last two decades, the current account adjusted for FDI has significantly improved, pointing to the likely high import content of FDI.

### Econometric Analysis

The analysis that follows investigates to what extent the positive association of longer-term IMF engagement and economic performance holds up when controlling for other factors and addressing the sample selection bias. The following two questions are addressed:

1. *How does longer-term IMF engagement affect macroeconomic performance, including growth, and institutional variables?* The approach used is the above-mentioned PSM, which is a two-stage process where (1) a first-stage regression estimates the propensity score (probability) of a country becoming a longer-term user of IMF-supported programs, and (2) the average economic performance of countries over a 10-year period is then compared between longer-term program users and others with similar propensity scores.
2. *What is the longer-term impact of IMF engagement on long-term economic growth, and what are the associated transmission channels?* We run panel regressions based on 10-year period averages that control for the determinants of long-run growth based on explanatory variables that have been commonly studied in the economic literature as well as a dummy variable identifying longer-term IMF engagement. The goal of the panel growth regressions is to identify possible channels through which Fund support may affect longer-term growth performance—namely, macroeconomic stabilization and provision of development financing.

The analysis uses a panel data set of 75 LICs and decadal averages spanning the period 1986–2010. Given the focus on longer-term engagement, we worked with decadal averages where periods share a 50 percent overlap with each other.<sup>12</sup> We also worked with yearly rolling decadal averages, but considered them suboptimal given the serial cor-

<sup>12</sup>This allows for a larger set of observations and also reduces the possible bias from arbitrarily selecting a 10-year period. The periods from which decadal averages are generated are: 1986–95, 1991–2000, 1996–2005, and 2001–10.

relation generated by the repetition of the bulk of the observations. For any given 10-year period, longer-term IMF engagement is captured by a dummy variable that takes the value of 1 if a country has had five or more years of IMF-supported programs in the 10-year period and 0 otherwise. The qualifying programs are all Fund financial arrangements available to LICs, primarily the ECF and its predecessors (PRGF, ESAF, and SAF) but also the SBA, ESF-HAC, and SCF, as well as the nonfinancial PSI. Program years have been purged of episodes when there were prolonged program interruptions.<sup>13</sup>

### The Propensity Score Matching Approach

To control for selection bias, a PSM selection equation is specified to estimate the determinants of longer-term IMF engagement. The independent variables are chosen broadly in line with the approach in the literature of including both demand and supply factors determining IMF support, with the aim of identifying a parsimonious set of variables that achieves a relatively good fit based on the historical data series. Longer-term IMF engagement is assumed to be determined by a country's initial macroeconomic buffers and its structural characteristics, as well as external demand conditions during the period, but also by the role of Fund quotas in determining the country's available financing. Initial macroeconomic buffers are proxied by the reserve coverage and the ratio of foreign aid to GDP at the beginning of each decade. Structural characteristics are proxied by a dummy variable identifying landlocked countries, political connectedness, natural resource rents, and institutional characteristics, with the latter stemming from the more recent empirical focus on political and institutional influences on Fund agreements. Trading partners' real GDP growth captures external demand conditions that are

<sup>13</sup>This is captured by examining cases in which there was a delay of more than six months in completing a review owing to noncompliance with macroeconomic performance criteria. The program interruptions series is taken from Bal Gündüz (2009) and updated by the authors of this study for the period from 2008–11.



entirely exogenous to LICs. Finally, countries' access to IMF resources is proxied by their Fund quota. Annex 1 presents additional discussion and estimation results.

The results of the PSM suggest that longer-term IMF engagement has been associated with improved macroeconomic and socio-institutional outcomes.

Table 3.2 presents the PSM results for dependent variables measured in changes in order to capture relative differences between countries with and without longer-term Fund engagement in their macroeconomic outcomes. The PSM estimations are run using four different matching approaches (nearest-neighbor matching, five-nearest-neighbor

**Table 3.2. Impact of Longer-Term IMF Engagement on Economic Performance**

	Nearest-neighbor matching	Five-nearest-neighbor matching	Radius matching	Kernel matching
GDP per capita growth	3.38 *** (0.80)	3.41 *** (0.73)	3.30 *** (0.75)	3.50 *** (0.68)
GDP per capita growth volatility	-1.85 (1.33)	-2.33 ** (0.99)	-2.02 *** (0.75)	-2.45 *** (0.90)
Inflation	-10.57* (5.60)	-10.46 ** (4.21)	-10.75 *** (3.98)	-9.60 ** (4.22)
Tax revenue	0.47 (0.90)	0.92 (0.73)	1.23* (0.69)	0.93 (0.76)
Government balance	3.58 *** (1.16)	3.52 *** (1.02)	1.59 (1.15)	3.38 *** (0.95)
Reserve coverage	0.18 (0.45)	0.20 (0.35)	0.32 (0.30)	0.15 (0.33)
Current account	-0.21 (1.44)	0.02 (1.08)	0.10 (1.02)	-0.08 (1.04)
FDI	1.76 *** (0.39)	1.86 *** (0.39)	1.06 *** (0.38)	1.85 *** (0.35)
External debt	50.23 (38.77)	-17.53 (27.18)	-4.19 (22.63)	-25.65 (19.90)
CPIA	0.26 (0.23)	0.31* (0.19)	0.14 (0.15)	0.33 (0.18)
Social spending	1.07 (0.67)	1.00* (0.52)	1.06 *** (0.34)	0.91 (0.57)
Education spending	0.78 (0.58)	0.80* (0.44)	1.01 *** (0.27)	0.80* (0.49)
Health spending	0.29 (0.27)	0.20 (0.24)	0.05 (0.16)	0.12 (0.23)
Aid	-0.45 (1.72)	0.17 (1.45)	-0.26 (1.45)	-0.19 (1.32)
Poverty gap	-3.90 (3.00)	-3.98* (2.39)	-3.83 ** (1.89)	-3.89 (2.59)
Poverty rate	-2.16 (3.18)	-2.98 (2.66)	-2.51 (2.43)	-2.49 (2.81)
Gini	-4.94* (2.56)	-3.67* (2.14)	-3.84 *** (1.38)	-3.58* (2.09)

Source: IMF staff calculations.

Note: Bootstrapped standard errors in parentheses. Each coefficient represents a separate estimation. All coefficient estimates share the same first-stage regression on the determinants of longer-term IMF engagement. Analysis is based on four 10-year period averages between 1986 and 2010 where periods overlap by 50 percent. A country is considered to have longer-term engagement in a given decade if in five or more years it had a financial arrangement or a Policy Support Instrument in place, for at least six months in each of these years. Changes in each variable refer to first decadal differences. \*10 percent significance; \*\*5 percent significance; \*\*\*1 percent significance. CPIA = Country Policy and Institutional Assessment; FDI = foreign direct investment.

matching, radius matching, and Kernel matching). The results include the following:

- Longer-term IMF engagement leads to significantly higher long-term real per capita GDP. The panel growth regressions that follow below attempt to identify some of the channels through which longer-term engagement may lead to such outcomes.
- Longer-term IMF users have significantly higher reductions in growth volatility and inflation, corroborating the role of continued Fund engagement in restoring or fostering macroeconomic stability.
- Improvements in the government balance are significantly larger for longer-term users.
- Longer-term IMF engagement is associated with significantly larger increases in FDI.
- The poverty gap decreased more for countries with longer-term IMF engagement. Declines in poverty rates are also larger for countries with longer-term IMF engagement, but they are not statistically significant. Data availability for poverty gaps and poverty rates is limited, especially for earlier years, leading to a significantly smaller regression sample and possibly less variation in the data.
- Longer-term IMF engagement is associated with significantly greater reductions in income inequality. Like the poverty data, data on income inequality are limited for the earlier years. However, the regression coefficients are consistently significant across matching techniques.
- Changes in social spending, in particular education spending, are larger for countries with longer-term IMF engagement. They are also positive but not statistically significant for health spending.
- Changes in reserve coverage, tax revenue, and CPIA are larger for countries with longer-term IMF engagement but are not significantly different from the control group (with the exception of the CPIA under one estimation). The relationship between longer-term IMF engagement and changes in aid, external debt, and the current account is not conclusive under the four estimation techniques.

At first sight some of these findings may seem surprising. For reserves, one possible explanation could be that the presence of an IMF-supported program implies that countries are often able to adjust less, since the availability of Fund financing serves to some extent as insurance when a balance of payments need arises. Therefore, countries may have less need to accumulate reserves, especially considering the high opportunity cost of doing so in countries where development needs are vast. Furthermore, oftentimes LICs requesting IMF financial support face protracted balance of payments needs and the necessity to undertake major structural reforms, so the role of IMF-supported programs may not necessarily be to boost reserves. This is also suggested by the first-stage regression, which links long-term Fund engagement with initial levels of reserves. As for aid and debt, it is quite plausible that the effect of IMF engagement is weakened when measured as an average over the decade but may be nevertheless significant at the start of an IMF-supported program, or at the point when debt relief is granted in the context of the program.<sup>14</sup>

<sup>14</sup>Some evidence of this is provided in the subsequent section on the impact of short-term IMF engagement, which corroborates the catalytic role of the Fund. Regarding debt, alternative participation equations do show that countries that received HIPC/MDRI debt relief face a higher probability of Fund engagement. However, even after controlling for the HIPC/MDRI status of countries in the sample, the second-stage regression results remain broadly the same. Regarding the nonsignificant impact of longer-term IMF engagement on debt, multiple events can be taking place within the span of a decade (which is our unit of measurement). For example, Fund programs may have catalyzed other donor financing on more concessional terms, thus reducing the burden on countries' budgets but increasing the debt-to-GDP ratios. An additional explanation includes the fact that debt relief operations may have allowed many LICs to scale up a significant amount of financing for their large capital spending projects (though in principle under sound debt sustainability analyses) aimed at fostering long-term growth and strengthening countries' capacity to repay.



### Panel Growth Regression

Panel regressions are used as a complementary approach to estimate the impact of longer-term IMF engagement on growth and to identify the associated transmission channels. The starting point for the growth specification follows a large strand of empirical growth literature that seeks to link economic growth performance to economic as well as institutional variables in a panel data set context. The analysis uses a generalized method of moments procedure that addresses endogeneity and controls for unobserved country-specific factors in order to estimate the growth effect of IMF engagement as well as other policy and nonpolicy variables. Under an initial regression specification, a model is estimated where we include as explanatory variables certain growth determinants that have received attention in the literature, but exclude variables that are likely to be under the direct influence of IMF-supported programs. In subsequent regressions, we augment our specification by including explanatory variables that are likely to be influenced by IMF engagement as identified in the PSM analysis above, and we study the change in magnitude of the coefficients associated with the longer-term IMF engagement dummy variable along with the changes in their statistical significance.<sup>15</sup> A variable will be considered a likely transmission channel if the coefficient associated with the Fund dummy variable decreases in size and/or significance relative to the benchmark model. All regressions also control for the endogeneity of longer-term IMF engagement through the inverse Mills ratio estimated in the first-stage PSM regression.<sup>16</sup>

The panel growth regressions corroborate the PSM findings that longer-term IMF engagement appears to support higher real per capita GDP growth. They also help to identify the transmission channels

<sup>15</sup>The variables used to augment the growth regressions must have turned out to be significant in the PSM analysis in conjunction with being common determinants of growth in the literature.

<sup>16</sup>The inverse Mills ratio is the ratio of the probability density function to the cumulative density function of a distribution.

**Table 3.3. Determinants of Long-Term Real Per Capita GDP Growth**

Long-term IMF engagement	3.52*	3.35	3.18*	3.53*
	(2.08)	(2.13)	(1.92)	(2.15)
Inflation		-0.003		
		(0.02)		
Growth volatility			-0.001	
			(0.12)	
IMF disbursements				-0.19
				(1.12)
Initial GDP per capita	0.97	0.79	0.49	0.92
	(2.42)	(2.57)	(2.19)	(2.75)
Trade openness	-0.02	-0.021	-0.01	-0.18
	(0.04)	(0.04)	(0.04)	(0.04)
Education	0.14**	0.13**	0.13**	0.14**
	(0.06)	(0.05)	(0.06)	(0.07)
Change in terms of trade	0.04	0.02	0.04	0.04
	(0.05)	(0.05)	(0.05)	(0.06)
Inverse Mills ratio	-1.80	-1.58	-1.56	-1.80
	(1.23)	(1.27)	(1.14)	(1.29)
Constant	-11.78	-9.55	-8.60	-11.48
	(14.23)	(15.44)	(13.59)	(16.39)
Observations/countries	181/54	178/54	181/54	181/54
Arellano-Bond test for AR(1) in first differences	0.16	0.29	0.20	0.20
Arellano-Bond test for AR(2) in first differences	0.56	0.36	0.43	0.56
Sargan test of overidentifying restrictions	1.00	0.99	0.99	1.00
Hansen test of overidentifying restrictions	0.38	0.41	0.29	0.34

Source: IMF staff calculations.

Note: Robust standard errors in parentheses. Analysis is based on four 10-year period averages between 1986 and 2010 where periods overlap by 50 percent. A country is considered to have longer-term engagement in a given decade if in five or more years it had a financial arrangement or a Policy Support Instrument in place, for at least six months in each of these years. \*10 percent significance; \*\*5 percent significance; \*\*\*1 percent significance.

through which this impact is achieved (Table 3.3). The findings include the following:<sup>17</sup>

<sup>17</sup>Mumssen and others (2013) report robustness of these results. The results presented so far are broadly consistent under four robustness checks entailing (1) changing the periods of analysis; (2) running alternative participation equations; (3) not correcting for IMF program implementation; and (4) including additional controls for the impact analysis, namely, donor aid and HIPC/MDRI. Furthermore, the authors conducted Rosenbaum's analysis for sensitivity to hidden bias and found that the results are less sensitive to hidden bias for all outcome variables compared to relevant thresholds.

- The regression results confirm the PSM finding above that longer-term IMF engagement appears to have a positive impact on long-term real per capita GDP growth.
- Based on the different specifications of the panel regression, it appears that real per capita GDP growth volatility is a significant transmission channel of the IMF's longer-term impact on growth.
- When both longer-term IMF engagement and the size of net Fund disbursements in the decade are controlled for, only the longer-term IMF engagement dummy is significant. This suggests that, for longer-term growth performance, it is the IMF's policy support that matters rather than the overall level of financing provided in this context.<sup>18</sup>

### Impact of Short-Term IMF Financing in Low-Income Countries

This section explores the short-term macroeconomic effects of IMF financial support to LICs experiencing immediate balance of payments needs as a result of policy slippages or external shocks.<sup>19</sup> The nature of Fund support evaluated in this section differs from the more extensive program support provided through successive medium-term arrangements, as discussed above. Here we focus on short-term IMF financial support, either through augmentations of access under existing medium-term financial arrangements or through short-term or emergency financing instruments. Such support would often be called for when a country faces a pressing balance of payments problem that requires a combination of macroeconomic adjustment and external financing. The IMF's engagement in these cases would typically involve understandings on short-term macroeconomic adjustment accompanied

by Fund financing, which could potentially have catalytic effects inducing additional bilateral and multilateral financing.

Sample selection bias is an even greater methodological challenge when the short-term impact of IMF-supported programs is studied. If countries that are experiencing balance of payments crises owing to policy slippages or exogenous shocks are more likely to participate in IMF-supported programs, failing to correct for selection bias could lead to a flawed conclusion that programs “cause” these crises along with adverse effects on macroeconomic outcomes. As in the previous section, this section employs the PSM methodology. In the first stage, the annual probability of participating in IMF-supported programs is estimated conditional on observable economic conditions and country characteristics. The second stage uses these probabilities, or propensity scores, to match program countries to nonprogram countries, and thereby construct a statistical comparison, or control, group (see Annex 1 for details).

### Empirical Analysis

The probability of participation in IMF-supported programs that address policy or exogenous shocks increases with the deterioration in the preshock macroeconomic conditions and the magnitude of the adverse external shocks. The selection model for LIC participation in IMF-supported programs draws on Bal Gündüz (2009). This study finds that lower reserve coverage, a deterioration in the current account balance, weaker real GDP growth, increased macroeconomic instability (evident in higher fiscal deficits, inflation, and exchange market pressures), and adverse terms of trade shocks would increase the likelihood of Fund financing. Moreover, global conditions, including changes in real oil and non-oil commodity prices and world trade, are also significant determinants of participation in IMF-supported programs which could potentially create cycles in demand for Fund financing as a result of adverse global shocks. Finally, persistent differences in the debt service burden and resource inflows among LICs seem to be significantly associated with unobserved country heterogeneity.

<sup>18</sup>The findings remain the same when gross IMF disbursements are controlled for to take into account the fact that over a 10-year period an IMF loan is typically repaid in full.

<sup>19</sup>The set of arrangements include those addressing an immediate balance of payments need arising from policy or exogenous shocks. SBAs, SAF/ESAF/PRGF/ECF augmentations, and Compensatory Financing Facility (CFF), ESF, SCF, and RCF arrangements are included in this set. The sample period covers 1980–2010. More details are provided in Annex 1.

While growth is estimated to be 0.9 percent higher than the control group for the full sample, the impact rises to 1¼ to 1¾ percent and becomes significant only for countries with high propensity scores, which indicate immediate balance of payments problems brought about by existing macroeconomic imbalances or external shocks (Table 3.4).<sup>20</sup> Furthermore, comparative changes in growth are positive but turn out to be significant only for those with high propensity scores.

Overall, program countries attain significantly higher current account balances, and reserve coverage, as well as lower inflation and fiscal deficits compared to their control groups. Moreover, reflecting the stabilization achieved under IMF-supported programs, these variables tend to post significant improvements during the program, with the impact especially pronounced for the high-propensity group. Although program countries tend to have more depreciated real exchange rates, differences with the control groups are not significant. Changes in real health and education spending per capita are not statistically different from those of the control group.

The estimated positive impact on growth could be attributed to IMF financing (along with its potential catalytic effects) easing the burden of the short-term adjustment as well as restoration of macroeconomic stability, especially for countries experiencing significant levels of instability prior to the program. Both commitments and disbursements of official development assistance (ODA) are significantly higher for the program group. Lower differences in disbursements than those of commitments compared to the control

<sup>20</sup>Mumssen and others (2013) report extensively on the robustness of these results to four sensitivity analyses: (1) relaxing the adjustment made for the implementation record of programs; (2) setting the sample to 1980–99 to improve the comparability of results to earlier research; (3) conditioning matching on propensity score and official development assistance disbursements to explore the Fund impact at similar levels of assistance; and (4) conditioning matching on propensity score and lagged GDP growth to examine whether the positive growth impact is driven by a cyclical recovery in program countries having very weak growth prior to the program. Results turn out to be robust to these tests. Further, they conduct Rosenbaum’s sensitivity analysis to hidden bias and find that results are less sensitive to hidden bias for all outcome variables for countries with high propensity scores.

group may suggest room for improving the utilization and predictability of ODA for program countries. However, contrary to the presumed catalytic role of IMF-supported programs, no significant change in ODA is detected. One explanation could be that some countries with high propensity scores could avoid or delay requesting Fund assistance thanks to an ad hoc increase in ODA flows, weakening the estimated catalytic impact for this group. Another explanation could be that ODA provided as budget support may be more responsive to IMF-supported programs than the project support. Additional exploration of this issue is left for further research.

## Channels

The empirical work presented above suggests that IMF program support has benefited LICs’ economies in two distinct ways:

- **Longer-term policy support appears to have helped LICs gradually build macroeconomic buffers.** Longer-term program support by the IMF is positively associated with higher long-term growth rates, less growth volatility, more rapid reduction in poverty and inequality, higher government balances, greater social spending, higher FDI, and lower inflation. Noticeably, this result does not seem to depend on the amount of Fund financing provided over the longer term.
- **Short-term liquidity support to LICs has likely played an important role in mitigating the impact of shocks.** Short-term IMF financial support in the context of shocks and policy slippages is positively associated with higher short-term growth, current account balances, and reserve coverage, as well as lower inflation and fiscal deficits compared to their control groups, with the impact especially pronounced for countries with high propensity scores, which indicate immediate balance of payments problems brought about by existing macroeconomic imbalances or external shocks.

What may explain these empirical results?

## Longer-Term Engagement

The IMF has had program engagement with almost half of all LICs for more than half of the

**Table 3.4. Results: Impact of Short-Term IMF Engagement by Propensity Score Matching**

	All LICs	LICs with weaker fundamentals	
		PS > 0.5	PS > 0.7
<b>Macroeconomic outcomes</b>			
Real GDP growth (%)	0.88 (0.56)	1.24* (0.66)	1.76** (0.75)
Inflation (%)	-12.09*** (4.11)	-14.30*** (4.95)	-15.83*** (5.76)
Reserve coverage (in months of imports)	0.77*** (0.15)	0.99*** (0.16)	0.81*** (0.16)
Current account balance plus FDI (% of GDP)	2.26** (0.98)	2.98*** (1.14)	3.97*** (1.32)
Government balance (% of GDP)	2.23*** (0.63)	2.50*** (0.77)	2.89*** (0.88)
Change in real health spending per capita (%)	8.38* (5.02)	8.59 (6.74)	13.42 (8.41)
Change in real education spending per capita (%)	0.85 (3.16)	-1.85 (4.07)	-3.45 (5.25)
Change in REER	-3.44 (5.8)	-3.40 (6.59)	-5.28 (7.66)
ODA commitments (% of GDP)	2.19*** (0.61)	1.78** (0.7)	1.92*** (0.75)
ODA disbursements (% of GDP)	1.55*** (0.52)	1.31** (0.57)	1.36** (0.62)
<b>Change in macroeconomic outcomes <math>X(t)-X(t-1)</math></b>			
Real GDP growth (%)	0.74 (0.75)	1.41 (0.87)	2.21** (1)
Inflation (%)	-6.45 (4.6)	-10.47* (5.33)	-13.96** (6.22)
Reserve coverage (in months of imports)	0.71*** (0.1)	0.93*** (0.11)	0.79*** (0.12)
Current account balance plus FDI (% of GDP)	1.44** (0.71)	2.03** (0.84)	2.43** (0.97)
Government balance (% of GDP)	0.78* (0.46)	1.06* (0.55)	1.41** (0.59)
Change in ODA commitments (% of GDP)	-0.24 (0.72)	-0.98 (0.87)	-1.04 (1.01)
Change in ODA disbursements (% of GDP)	-0.15 (0.42)	-0.57 (0.49)	-0.73 (0.57)
Number of observations <sup>1</sup>	633	349	293

Source: IMF staff calculations.

Note: PS stands for the propensity score indicating the likelihood of IMF programs addressing immediate balance of payments needs. Changes in macroeconomic outcomes refer to first differences of the variables in the top panel. The sample is composed of 58 low-income countries (LICs) and covers 1980–2010. \* Significant at 10 percent; \*\* at 5 percent; \*\*\* at 1 percent. Standard errors in parentheses. FDI = foreign direct investment; ODA = official development assistance.

<sup>1</sup> All variables except for health and education spending and change in the real effective exchange rate (REER), for which data are more limited.

last 25 years. Many commentators initially saw the emergence of this longer-term engagement as a sign of failure, believing that it must reflect flaws in either the design or the implementation of IMF-supported programs that resulted in a dependence on Fund financing.<sup>21</sup> However, the results presented above suggest that, rather than being symptomatic of failure, the prolonged engagement may have led to sustained, if gradual, improvements in the macroeconomic performance of most program countries. The fact that the amount of IMF financing is not in itself significant may point to the importance of nonlending aspects of programs in delivering improved macroeconomic results.

There are several nonfinancial channels through which IMF-supported programs may have an impact:

- **Ensuring a consistent macroeconomic framework.** An IMF-supported program can help a country in developing a comprehensive and coherent macroeconomic framework. This important coordinating role ensures that monetary and fiscal targets are mutually consistent and compatible with macroeconomic stability. Countries with repeated IMF-supported programs were therefore less likely to have imbalances manifested in the form of rapid inflation or unsustainable fiscal and current account deficits that could undermine growth.
- **Policy advice and conditionality.** With the IMF undertaking missions to these countries several times a year, countries with programs tend to have a close engagement with the Fund on key policy issues. The Fund's advice goes beyond the core area of ensuring macroeconomic and financial stability. It also covers fiscal issues such as strengthening revenue efforts to reduce reliance on external borrowing, public financial management and natural resource revenue management, and the orientation of spending toward pro-poor and pro-growth projects. Significant attention is also paid to monetary issues such as central bank operations and monetary policy, and broader structural reforms aimed at supporting

<sup>21</sup>See Independent Evaluation Office (2002) for such a discussion.

the country's development strategy. In this way the IMF may have provided a useful independent source of advice to country authorities that could have resulted in improved outcomes.

- **Debt relief.** The IMF has played a major role in supporting the debt relief process that eased the burden of many LICs—first in its role at the Paris Club, and later through participation in and support of the HIPC Initiative and MDRI. By making an IMF-supported program a precondition for debt relief, the international community undoubtedly increased the demand for engagement with the Fund. To some extent, the reduced debt burden that resulted from the debt relief process may also have supported better economic outcomes.
- **Capacity building.** While all member countries are able to benefit from IMF technical assistance (see below), those with programs have traditionally been the most intensive users. The deep engagement implied by IMF-supported programs can bring to light particular weaknesses that the Fund can then help advise on how to solve.
- **Catalytic role.** There is some evidence that an IMF-supported program can encourage additional aid flows from other donors.<sup>22</sup>

The relative importance of these factors has varied from country to country and over time. In the case of Senegal, for example, the Fund's most intensive engagement came in the aftermath of the 1994 devaluation of the CFA franc, as the authorities sought to restore the conditions for growth and external balance (Box 3.1). In Mozambique, under somewhat different circumstances, the Fund's initial value added was in providing a framework for macroeconomic stabilization and supporting market-oriented structural reforms in a post-conflict situation where the state had played a dominant role in the economy (Box 3.2). In more recent years, as the initial imbalances in both countries were addressed, IMF support

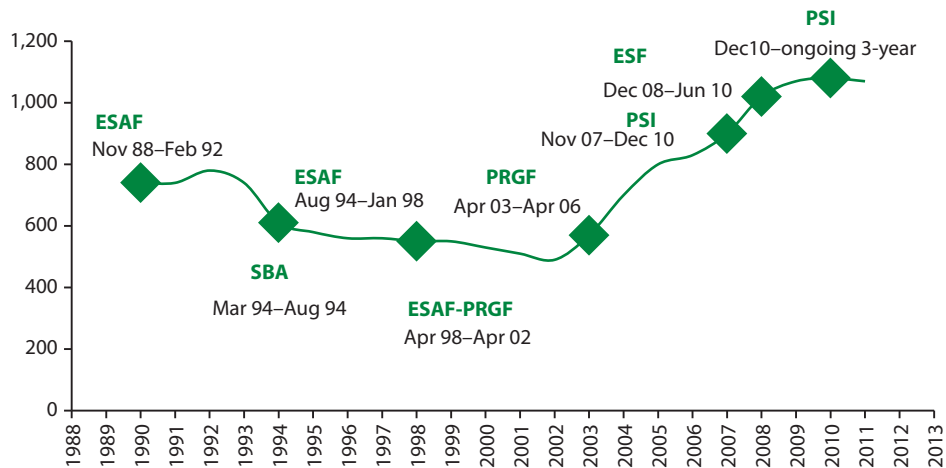
<sup>22</sup>Bird and Rowlands (2007) explore the extent to which the IMF has had a catalytic effect on official development assistance and the potential channels through which catalysis might work. They find strong evidence of a positive association between participation in IMF-supported programs and ODA and suggest that this may have more to do with conditionality than with the provision of IMF resources.

**Box 3.1. IMF Engagement in Senegal**

In the early 1990s, unfavorable trade developments combined with weaknesses in fiscal and financial policies led to a deterioration in the macroeconomic situation in a number of countries in the CFA franc zone, which was pegged to the French franc. With the fiscal and balance of payments situation worsening, the countries of the CFA franc zone decided to seek to restore competitiveness by devaluing the exchange rate on January 12, 1994, from CFA francs 50 to CFA francs 100 per French franc. This decision also reflected the advice of the IMF and other donors, which had pointed out the increasing costs of relying on internal adjustment alone.

Following the 1994 devaluation, the government of Senegal undertook a series of adjustment and economic reform programs aimed at restoring the conditions for strong, sustainable economic growth and ensuring domestic and external financial viability. These programs were based on strict management of domestic demand to bring inflation and the government deficit quickly under control, and on implementation of wide-ranging structural reforms aimed at liberalizing the economy, reducing the size of the public sector, and fostering private sector development. The programs also involved implementation of ambitious plans to improve the provision of health and education services and, more generally, to raise the living standards of the most disadvantaged social groups. In this effort to thoroughly restructure its economy, Senegal received substantial assistance from the international community, particularly the IMF (Figure 3.1.1), World Bank, European Union, and several bilateral partners. The implementation of the reform program was coupled with a deepening of the democratic process, decentralization, and the transfer of responsibilities to local governments.

**Figure 3.1.1. IMF Arrangements in Senegal**  
(GNI per capita in current U.S. dollars)



Source: IMF staff calculations.  
 Note: ESAF = Enhanced Structural Adjustment Facility; ESF = Exogenous Shocks Facility; GNI = gross national income; PRGF = Poverty Reduction and Growth Facility; PSI = Policy Support Instrument; SBA = Stand-By Arrangement.



### Box 3.2. IMF Engagement in Mozambique

Twelve years after independence in 1975, a legacy of war, socialist experiments, and weak institutions had left Mozambique ranked as the world's poorest economy. Tax revenue and export earnings had collapsed, the debt burden had spiraled out of control, and physical and human capital had collapsed. A development strategy focused on large state farms and import-substitution had failed to deliver growth, and had fostered inefficiencies and rent-seeking that compounded the unfavorable external environment, exacerbated the ongoing conflict, and led to faltering agricultural and industrial production. With the central planning system increasingly questioned, the authorities sought support from the IMF and World Bank on economic reforms (Figure 3.2.1).

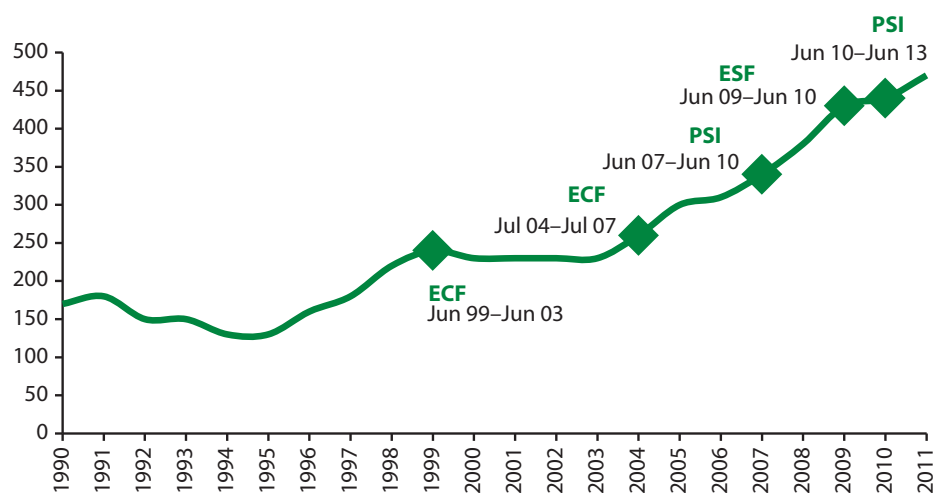
Early IMF programs focused on reestablishing a system of market prices as a precondition for economic stabilization and output recovery. Measures included adjustments of the official exchange rate and a progressive reduction in the number of commodities subject to price control, tariff reforms, and the phasing out of import licensing schemes and export retention schemes. Subsidies on consumer items were replaced by food distribution as well as income supplements for the urban poor. Fiscal measures focused on improving revenue mobilization and containing recurrent expenditure.

The move to a market-based economy in 1987 led to a sustained economic recovery. Real GDP growth reached an average of about 7 percent from 1987 to 1991, and inflation declined from more than 160 percent in 1987 to below 35 percent in 1991. Growth increased following the cease-fire in 1992, driven by large industrial projects (“megaprojects”) financed by foreign direct investment. Real GDP grew by an average of 8 percent between 1993 and 2012. However, while poverty rates have declined, growth has become less pro-poor, as it has relied on the role of megaprojects, which have had a limited effect on generating employment and fiscal revenues. Reflecting Mozambique’s strong policy track record of reform, the country received over \$6 billion in debt relief under the HIPC Initiative (2001) and MDRI (2006). It is also one of the largest recipients of aid and has benefited from Fund advice on management of scaled-up aid and, more recently, on the management of natural resources.

Recent IMF programs have placed a greater emphasis on poverty reduction. The structural objectives include strengthening government revenue, enhancing the efficiency and transparency of government operations, and improving bank supervision and financial sector intermediation. Mozambique is working closely with the Fund to strike a balance between addressing pressing infrastructure bottlenecks and taking into account the risks entailed in a rapid expansion of external debt.

**Figure 3.2.1. IMF Arrangements in Mozambique**

(GNI per capita in current U.S. dollars)



Source: IMF staff calculations.

Note: ECF = Extended Credit Facility; ESF = Exogenous Shocks Facility; GNI = gross national income; PSI = Policy Support Instrument.

has become more focused on public financial management, scaling up infrastructure investment, and health and education spending.

Moreover, to the extent that IMF engagement across the membership can deliver some of these benefits, the results presented above may understate the impact of Fund support. The IMF carries out bilateral surveillance of the entire membership through the annual Article IV process, which can be particularly useful in the case of LICs, where alternative sources of comprehensive macroeconomic information are often scarce. These discussions can also provide an important opportunity for the authorities to assess the coherence of their domestic and external policies. A survey by the IMF's Independent Evaluation Office (2012) reported that three-quarters of LIC authorities found that the Fund had been "effective" or "very effective" in contributing to the development of policy frameworks. The published Article IV reports are widely used by the donor and investor community as an input in their aid and investment decisions.<sup>23</sup>

Similarly, the impact of the IMF's work on capacity-building is not limited to program countries, since the Fund provides technical assistance in its areas of core expertise to the entire membership. On average, around 40 percent of IMF technical assistance is provided to LICs. IMF Resident Representatives can also provide frequent and timely policy advice. In countries where aid is an important source of finance for the budget and the balance of payments, the Resident Representative often plays a significant role in working with the authorities and the donor community in support of aid effectiveness and harmonization. While most Resident Representatives are in program countries, with a presence in over 80 countries, many countries

without or between programs also have Resident Representatives.

### Short-Term IMF Financial Support

The impact of short-term financial support is somewhat easier to discern. For example, the global SDR allocation along with the IMF's sharp increase in financial assistance in 2009—doubling access and increasing commitments to roughly four times the historical average—helped relax countries' liquidity constraints at the height of the global financial crisis, which allowed them to preserve or even increase spending.<sup>24,25</sup> The combination of stronger pre-crisis buffers and crisis financing allowed most LICs to mount a countercyclical fiscal policy response in 2009—a first for these countries, which in past crises tended to cut spending and tighten the fiscal stance (sometimes also running arrears).<sup>26</sup> This domestic response facilitated a rapid economic recovery in LICs, which in past crises had lagged behind the rest of the world.

<sup>23</sup>In recent years, the IMF's surveillance has become increasingly transparent. In 2011, 98 percent of member countries agreed to the publication of a Public Information Notice, which provides information on the IMF Executive Board's assessment of the member's macroeconomic and financial situations; and 91 percent published the Article IV consultation staff report (stand-alone or combined with an assessment of an IMF-supported program or other related matter) that was the basis of the board's assessment.

<sup>24</sup>This came in addition to the Fund's response to the food and fuel price shocks of 2008, when various new programs and augmentations were approved and the ESF was modified to better support eligible members.

<sup>25</sup>See IMF (2010). For a detailed analysis of program design and objectives, and outcomes, see IMF (2012c).

<sup>26</sup>See Fabrizio (2009, 2010) for a discussion of how LICs responded to the global financial crisis.



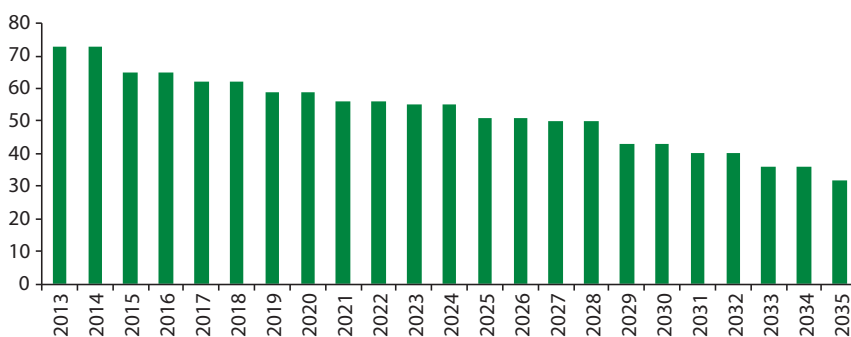
While the balance of evidence suggests that the IMF has in most cases played a helpful role in supporting growth and reducing poverty in its LIC members, it is also clear that, with over 900 million people worldwide projected to remain on the edge of poverty in 2015, progress in too many cases has been too slow and uneven. Moreover, in the coming years the needs of LICs will continue to change as they integrate into the global economy, as the overall aid architecture evolves, and as technological change creates new opportunities but also new vulnerabilities. This section reviews ongoing discussions on the financing of the IMF's work in LICs, and considers possible improvements to the framework under which the Fund engages with those countries.

### Financing

Demand for concessional financing from the IMF is inherently unpredictable. As we saw from the dramatic increase in lending between 2007 and 2009, unexpected exogenous events can have a major impact on demand for IMF-supported programs even when LICs themselves maintain broadly appropriate economic policies. Nevertheless, there are certain discernible broad trends that will have a major impact on demand for IMF program engagement in LICs:

- **Continued global uncertainty in the near term.** The financing needs of LICs are likely to remain elevated until the financial and economic issues in Europe are resolved, and until growth is more firmly entrenched in the United States and other major economies. Moreover, the financial buffers of LICs remain diminished relative to the period before 2008.
- **Continued graduation of countries from the IMF's concessional financing terms.** Based on projected GDP growth rates from the IMF's *World Economic Outlook* and an assumption of growth trending toward the low-income average over the long term, slightly over half of the current Poverty Reduction and Growth Trust (PRGT)-eligible countries would be expected to graduate from eligibility to receive concessional support from the IMF over the next 20 years (Figure 4.1).
- **Declining reliance on continuous access to IMF finance.** Most of the remaining PRGT-eligible countries should continue to graduate out of repeated ECF use toward nonfinancial instruments such as the PSI. However, as we saw during the recent crisis, such countries could still have reason to access IMF financing on an intermittent basis when they are hit by shocks. Indeed, as such countries grow and become increasingly open, the amount of financing they require in the face of a given shock will tend to increase until they graduate.

**Figure 4.1. Projected Number of Countries Eligible for Support under the Poverty Reduction and Growth Trust**



Source: IMF staff calculations and projections.

- **Ongoing need for assistance in selected countries.** Certain countries, particularly fragile states and those emerging from conflict, may still require repeated RCF and ECF support before they are able to strengthen their macroeconomic positions sufficiently that they no longer require longer-term Fund financing.

### Current Financing Framework

IMF concessional lending to low-income countries is financed from the PRGT, which in turn is funded by bilateral members' contributions or transfers and by various contributions originating from the IMF itself that are approved by the membership. The IMF Executive Board took a decision in September 2012 that would increase annual lending capacity to LICs to an estimated SDR 1.25 billion (Figure 4.2) on a self-sustained basis (i.e., without a further infusion of resources to the PRGT). Absent a persistent change in trends, this is sufficient to meet the average projected base level demand for PRGT resources over the next 20 years.<sup>1</sup> The three key elements of the financing package adopted by the IMF Executive Board were

- Use of the windfall profits from the recent gold sales;<sup>2</sup>
- Contingent measures that could be triggered during periods of high demand, including additional bilateral contributions; and
- A presumption that any future changes to the LIC lending facilities would be designed in a manner that is consistent with maintaining the self-sustainability of the PRGT.

### Modalities

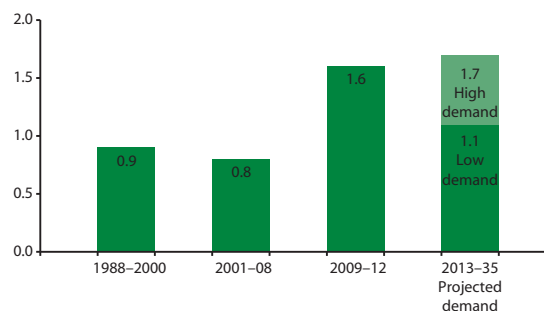
The empirical work suggests that the IMF's facilities for LICs appropriately include a diverse set of

<sup>1</sup>The previous financing strategy assumed elevated lending of SDR 2 billion a year up to 2014 (during the global financial crisis) and a sharp drop in 2015 to SDR 700 million a year thereafter.

<sup>2</sup>Since transfers of gold profits cannot be made directly to the PRGT, the money will be distributed in the first instance to the membership, but only after assurances are received that 90 percent of the amount will be remitted back to the PRGT.

**Figure 4.2. Poverty Reduction and Growth Trust Average Annual Lending Commitments, 1988–2035**

(In billions of Special Drawing Rights)



Source: IMF staff calculations and projections.

tools, including some that focus on medium-term policy support and others that focus on short-term financing. It highlights the benefits of the ECF and PSI, which can provide policy support over the medium term. It also underlines that, whether or not a country has an ECF or PSI in place, Fund financing may need to be provided quickly and on an appropriate scale when urgent balance of payments needs arise, either through augmentations of the ECF or support under the SCF or RCF. It can also be inferred that, in the absence of shocks or urgent financing needs, ECF arrangements and precautionary SCF arrangements can have a significant value for LICs, even at low access levels, as they can provide both policy support (through well-designed macroeconomic programs) and insurance (through the possibility of disbursements in the event that shocks arise).

The IMF also recently conducted a review of its facilities to assess whether the new framework put in place in 2009 is working effectively. The review concluded that the 2009 reforms had been broadly successful in closing gaps and creating a streamlined architecture that met the needs of LICs. The review also concluded that, coupled with a doubling of access, the IMF was able to mount an effective response to LICs' needs during the global financial crisis (IMF, 2012a, 2013). The review advanced a set of concrete proposals to improve the tailoring and flexibility of Fund facilities and instruments for LICs while, in the aggregate, keeping the demand for resources within the self-sustaining capacity of the PRGT in normal times while also preserving the

integrity of the LIC facilities architecture and meeting the objective of simplicity. The proposals that were adopted entailed

- Increasing the scope for blending subsidized resources from the PRGT with general resources of the Fund in order to preserve concessional resources for the poorer LICs;
- Facilitating access to Fund resources when external shocks unexpectedly increase financing needs through a streamlined process to request augmentations between reviews;
- Enhancing operational flexibility through streamlined modalities.

### Policy Challenges

Looking ahead, the IMF will have to consider what it can do to further strengthen the links between programs and the goals of growth and poverty reduction, while at the same time respecting countries' ownership of their development agendas. Experience shows that while fast growth has lifted all boats to some degree or another, it has been less successful in lifting up the poorest segments of society. While remaining committed to the goal of generating growth, the Fund needs

to deepen its understanding of which policies foster sustainable and inclusive growth. Lessons learned need to make their way into the design of future IMF-supported programs. Under this overarching objective, several areas of interest can be of particular relevance for LICs:

- Many LICs need to have appropriate tools to calibrate investment policies and determine the appropriate use of scarce public resources while enhancing capacity to evaluate, select, and execute public investment projects.
- Financial sector surveillance and risk monitoring will continue to be areas of IMF responsibility and expertise and will become even more critical as LICs become more financially integrated with the rest of the world and more prone to financial crises. In addition, the Fund has an important role to play in frontier LICs that are ready to access capital markets.
- Given the key role that natural resources can play as drivers of future growth in some LICs, the IMF can play an important role in helping countries design stronger macroeconomic frameworks, including the choice of appropriate fiscal rules that help address volatility while ensuring long-term sustainability.

## Addressing Selection Bias—Alternative Approaches

The literature on the impact of IMF-supported programs has used various approaches to address sample selection bias, with the aim of constructing a credible counterfactual. One strategy is the “before-after” approach, which assumes that all the conditions that can affect a country’s performance are the same before a program is in place as they are after, hence any change in performance can be attributed to the IMF-supported program (Ghosh and others, 2005). This method suffers from biases associated with changes in the economic structure of the country or shocks between the two periods that are unrelated to the decision to participate in a program. Another approach is to use instrumental variables that are correlated with treatment selection but are not directly correlated with the outcome variable. The identification of appropriate and truly exogenous instruments is a major challenge for this approach. The Generalized Evaluation Estimator (GEE) uses policy reaction functions for nonprogram countries to approximate the counterfactual (Goldstein and Montiel, 1986). However, Dicks-Mireaux, Mecagni, and Schadler (2000) largely discredit the validity of the GEE owing to many restrictive assumptions necessary to define the counterfactual based on policy reaction functions.<sup>1</sup> Yet another approach is Heckman’s selection correction model, which reduces the sample selection problem to an omitted-variable problem. In the first stage, a probit model is used to predict the probability of IMF-supported program engagement and in the second stage, the inverse Mills ratio, a transformation of the predicted individual probabilities from the first stage, is included as a regressor.<sup>2</sup> The latter

<sup>1</sup>They report that the counterfactual policy reaction function does not have any significant explanatory power for the sample of nonprogram observations.

<sup>2</sup>The inverse Mills ratio is the ratio of the probability density function to the cumulative density function of a distribution evaluated at observed covariates of each observation using the estimated coefficients of the probit regression.

term drops out only if the correlation between unobserved determinants of program participation and unobserved determinants of the outcome variable is 0. Heckman-type selection models are appropriate only when at least one explanatory variable influences selection but not the outcome of interest, which is known as an exclusion restriction. A final method, used in this paper, is discussed below.

## Methodology

The econometric analyses in this annex use the PSM approach to control for selection bias. This is a relatively new and innovative class of statistical methods for impact evaluation. It involves a statistical comparison of country groups based on two steps:

- First, the probability of participating in IMF-supported programs is estimated conditional on observable economic conditions and country characteristics (selection model);<sup>3</sup>
- Second, these probabilities, or propensity scores, are used to match program countries to nonprogram countries, and thereby construct a statistical control group.

The matching based on the likelihood of participation in IMF-supported programs assures similarity of initial macroeconomic conditions and country characteristics in the comparison, or control, group. The control group provides in effect a proxy for the counterfactual, that is, for macroeconomic outcomes if program countries had not had a program. The effects of the IMF-supported program are then calculated as the mean difference in a range of macroeconomic outcomes across these two groups.

The results from this approach should be interpreted with caution, as PSM is useful when only observed pretreatment characteristics are believed

<sup>3</sup>This paper estimates two selection models: the first equation looks into factors determining the longer-term engagement in IMF programs, while the second equation explains determinants of annual participation in IMF programs addressing immediate balance of payments needs.

to affect program participation. Two necessary assumptions for identification of the program effects are conditional independence and the presence of a common support. Conditional independence, also called confoundedness, implies that program participation is based entirely on observed preshock characteristics of LICs. If unobserved characteristics determine program participation, conditional independence will be violated, and PSM would not be an appropriate method. Using a rich set of preprogram data to estimate the probability of participation in IMF-supported programs helps support the conditional independence assumption. In other words, a well-specified and comprehensive selection model explaining the participation in IMF-supported programs is the key to properly assessing the impact of those programs. The second condition—presence of a common support—ensures that treatment observations have comparison observations “nearby” in the propensity score distribution.

In the analyses of this paper, IMF engagement is taken as a treatment status, analogous to the program evaluation literature in microeconomic studies.<sup>4</sup> Countries that have engagement with the Fund are called the treatment group, whereas the remaining others in the sample are called the control group. The average treatment effect of IMF engagement on the treated group (*ATT*) is given by

$$ATT = E[Y_{i1} | D_i = 1] - E[Y_{i0} | D_i = 1], \quad (1)$$

where  $D$  is the dummy variable identifying LICs with IMF engagement in a given window period (annual for short-term engagement, and decadal for longer-term engagement),  $Y_{i0} | D_i = 1$  is the value of the macroeconomic outcome that would have been observed if a LIC with IMF engagement had not experienced such an engagement, and  $Y_{i1} | D_i = 1$  is the outcome value observed on the

<sup>4</sup>The use of the PSM technique in the macroeconomic literature has been popularized by recent empirical papers focusing on the effects of the inflation-targeting arrangement on macroeconomic performances (Lin and Ye, 2007, 2009; Lin, 2010), on the effects of fiscal rules on fiscal behavior in developing countries (Tapsoba, 2012), and on the economic effects of foreign capital flows (Chari, Chen, and Dominguez, 2012).

same country. The key assumption needed to apply the matching method is the conditional independence assumption, which requires that, conditional on some control variables  $X$ , the outcomes be independent of the IMF engagement dummy  $D$ . Under this assumption, equation (1) can be rewritten as

$$ATT = E[Y_{i1} | D_i = 1, X_i] - E[Y_{i0} | D_i = 0, X_i], \quad (2)$$

where we have replaced  $E[Y_{i0} | D_i = 1, X_i]$  with  $E[Y_{i0} | D_i = 0, X_i]$ , which is observable. Rosenbaum and Rubin (1983) propose to match the treated units and control units on their propensity scores (which represent here the probabilities of being long-term IMF program countries for the longer-term engagement or participating in annual IMF-supported programs addressing immediate balance of payments needs for the short-term engagement) conditional on  $X$ , estimated by simple probit or logit models. A further assumption needed to apply propensity score matching is the common support assumption ( $p(X_i) < 1$ ), which requires the existence of some comparable control units for each treated unit. When propensity score matching is used, the *ATT* now can be estimated as

$$ATT = E[Y_{i1} | D_i = 1, p(X_i)] - E[Y_{i0} | D_i = 0, p(X_i)] \quad (3)$$

The strategy then consists of computing the differences in the outcomes ( $Y_i$ ) for observations with similar propensity scores (the probability of engaging with the IMF). Various methods have been proposed in the literature to match observations. In this study, we present results using various matching techniques (nearest-neighbor, radius, and Kernel matching). The nearest-neighbor matching estimator sorts all records by the estimated propensity score and then searches forward and backward for the closest control units. In this study we make use of the three, four, and five nearest neighbors. Radius matching uses all comparison observations within a predefined distance around the propensity score, while Kernel matching entails a weighted average of the outcome of all nontreated units, where the weights are related to their proximity to the treated unit.

## Specification of the Selection Model

Despite the vast literature on determinants of IMF arrangements, existing models are far from definitive. Bird (2007) argues that the empirical evidence so far may imply that important determining variables may still have been omitted, or there is no one overall explanation for IMF arrangements. Consistent with this view, the econometric analysis in this paper focuses on the subgroup of LICs and distinguishes longer-term engagement from short-term financing, thereby creating more homogenous samples that allow for a more robust identification of the determinants of participation in IMF-supported programs.

### Selection Model for Longer-Term IMF Engagement

The selection model estimated is a pooled probit regression. The dependent variable is a dummy variable identifying longer-term IMF engagement. The dummy variable takes the value of 1 if a country has had five or more years of IMF-supported programs in a 10-year period and 0 otherwise. The qualifying programs are all Fund financial arrangements available to LICs, primarily the ECF and its predecessors (PRGF, ESAF, SAF), but also the SBA, ESF-HAC, and SCE, as well as the nonfinancial PSI. Program years have been purged of episodes when there were prolonged program interruptions.<sup>5</sup> Given the focus on longer-term engagement, the analysis is based on decadal averages in which periods share a 50 percent overlap with each other in order to increase the number of observations.<sup>6</sup> Longer-term IMF engagement is determined by a country's initial macroeconomic buffers, structural characteristics, and external demand conditions and the size of its Fund quota. The independent variables are chosen broadly in line with

<sup>5</sup>Following the approach introduced by Mecagni (1999), a delay of more than six months in completing a review owing to noncompliance with macroeconomic performance criteria is taken as an interruption. The program interruption series is taken from Bal Gündüz (2009) and updated for the period from 2008 to 2011. Bal Gündüz used the Ivanova and others (2003) data set, identifying interruptions for the whole program as an input, and extended it to identify specific years of interruptions and the Mecagni (1999) data set, which identified program interruptions for the SAF/ESAF.

<sup>6</sup>The periods from which decadal averages are generated are 1986–95, 1991–2000, 1996–2005, and 2001–10.

**Table A1.1. Determinants of Longer-Term IMF Engagement**

Initial reserves	–0.156*** (0.04)
Initial aid/GDP	0.016* (0.01)
Trading partner growth	–0.092 (0.07)
IMF quota/GDP	–0.078** (0.03)
Resource rents/GDP	–0.020** (0.01)
Landlockedness	0.741*** (0.21)
Political connectedness	0.010* (0.01)
Polity	0.010 (0.02)
Constant	0.362 (0.52)
Observations	203

Source: IMF staff calculations.

Note: Robust standard errors in parentheses. A country is considered to have longer-term engagement in a given decade if in five or more years it had a financial arrangement or a Policy Support Instrument in place, for at least six months in each of these years. \*10 percent significance; \*\*5 percent significance; \*\*\*1 percent significance.

the literature's approach of including both demand and supply factors, with the aim of identifying a parsimonious set of variables that achieves a relatively good fit based on the historical data series. Initial macroeconomic buffers are proxied by the reserve coverage and the ratio of foreign aid to GDP at the beginning of each decade. Structural characteristics are proxied by a dummy variable identifying countries' geographic characteristics as well as resource rents in the economy. Institutional characteristics are captured by variables related to political connectedness and polity.<sup>7,8</sup> Trading partners' real GDP growth captures external demand conditions that are entirely exogenous to LICs. Finally, countries' access to IMF resources is proxied by their IMF quota. The empirical findings (Table A1.1) indicate that countries with

<sup>7</sup>Recent empirical studies have highlighted the role of institutional characteristics in explaining IMF agreements. See Bird and Rowlands (2001), Butkiewicz and Yanikkaya (2005), and Stone (2004).

<sup>8</sup>Political connectedness is a composite indicator capturing the presence of foreign embassies in a country, a country's membership in international organizations, participation in UN Security Council missions, and ratification of international treaties.



higher initial reserves and lower aid have exhibited a lower propensity for longer-term IMF engagement. Moreover, the probability of longer-term Fund engagement tends to increase with lower trading partner economic growth in the decade. Finally, landlocked and resource-poor countries have had a higher propensity for longer-term IMF engagement, while a larger quota and a lower political connectedness have implied a lower probability of longer-term engagement.<sup>9</sup>

### Selection Model for the Short-Term IMF Engagement

The selection model adopted in this study draws on Bal Gündüz (2009).<sup>10</sup> This is the only study looking into determinants of LIC participation in IMF arrangements addressing immediate balance of payments needs in response to domestic policy and/or external shocks. Examining this more homogenous subset of Fund arrangements significantly improves the specification of the selection model, which is key to counter selection bias to properly assess the impact of IMF-supported programs.

The dependent variable is a panel dummy variable, taking the value of 1 if a new IMF arrangement is approved, and 0 otherwise, indicating a normal episode. The set of arrangements include those addressing an immediate balance of payments need arising from policy and/or exogenous shocks. SBA, SAF/ESAF/PRGF/ECF augmentations, ESF, SCF, RCF, and CFF are included in this set. The following refinements are made to this basic set: (1) precautionary SBA/SCF and SBA/PRGF/ECF augmentations addressing natural disasters are excluded,<sup>11</sup> and (2) some SAF/ESAF/PRGF/ECF

arrangements are added if they address immediate balance of payments needs arising from policy shocks. In order to systematically determine the latter cases, this study relied heavily on program interruptions preceding SAF/ESAF/PRGF/ECF arrangements. For first-time SAF/ESAF/PRGF arrangements, narratives from IMF staff reports are used to identify programs that envisaged a drastic shift in macroeconomic policies to address an immediate financing gap. Normal episodes are identified as the initial year of two successive years with no IMF financing for shocks when the member is eligible to access Fund resources. Several refinements are made to normal episodes to identify cases where supply constraints are binding:<sup>12</sup>

- The effects of various economic variables on the probability of a LIC requesting Fund financing in response to shocks are assessed by estimating a binary response model for panel data. The general specification for panel probit models is given by

$$\begin{aligned}
 y_{it} &= 1 && \text{if Fund financing is requested} \\
 y_{it} &= 0 && \text{normal episodes} \\
 P(y_{it} = 1 | x_{it}, c_i) &= \Phi(x_{it}'\beta + c_i) \\
 &&& i = 1, \dots, n \text{ and } t = 1, \dots, T, \quad (4)
 \end{aligned}$$

where  $y$  is the observed outcome,  $\Phi$  is the cumulative normal density function,  $X_{it}$  is the  $1 \times k$  vector of explanatory variables, and  $\beta$  is the  $k \times 1$  vector of coefficients associated with  $X_{it}$ . Different estimators are constructed depending on their assumptions for the panel

<sup>9</sup>A country's quota as a share of GDP is interpreted here as the size of the available financing relative to the country's economic needs. The more "related" the quota is to the size of the economy, the less need for a country to become a long-term user of IMF resources.

<sup>10</sup>Before Bal Gündüz (2009), only Bird and Rowlands (2009) looked into determinants of IMF arrangements with LICs, albeit without much success in improving the model specification. Only three variables turned out to be significant: the presence of previous Fund arrangements, high inflation, and the rescheduling of debt in the current year.

<sup>11</sup>The exclusion was based on the lack of immediate balance of payments need for precautionary SBAs and the different nature of

the shock for SBAs and PRGF augmentations addressing natural disasters.

<sup>12</sup>Members with overdue obligations to the IMF are ineligible to use Fund resources, so observations with arrears to the Fund are excluded from normal episodes. Also excluded are observations with Fund financing for natural disasters through the ENDA or PRGF augmentations, program interruptions or break-up of negotiations for a program, the Staff-Monitored Program, the EPCA, and three years leading up to EPCAs. Finally, episodes during which members incurred arrears to other bilateral and multilateral creditors and did not have adjustment programs that would garner Fund support and rescheduling by their major creditors are excluded from normal episodes.



heterogeneity, that is, how they treat  $c_i$ .<sup>13</sup> The estimations are carried out step by step under different estimators, and a correlated random effects probit model is preferred based on the econometric tests for the significance of both the individual specific effect and the sample average for covariates.

- Bal Gündüz (2009) finds that a number of economic variables are significantly associated with increased probability of Fund financing, including reserve coverage, the ratio of the current account balance to GDP, real GDP growth, the macroeconomic stability indicator, and terms of trade shocks (Table A1.2).<sup>14</sup> Moreover, Bal

<sup>13</sup>Pooled probit models assume independence of observations over both  $t$  and  $i$ . A random-effects probit model treats the individual specific effect,  $c_i$ , as an unobserved random variable with  $c_i | x_i \sim IN(\mu_c, \sigma_c^2)$  if an overall intercept is excluded, and imposes independence of  $c_i$  and  $x_i$ . A fixed-effects probit model treats  $c_i$  as parameters to be estimated along with  $\beta$ , and does not make any assumptions about the distribution of  $c_i$  given  $x_i$ . This can be problematic in short panels as both  $\beta$  and  $c_i$  are inconsistently estimated owing to an incidental parameters problem. Finally, a correlated random effects model relaxes independence between  $c_i$  and  $x_i$  using the Chamberlain (1982)-Mundlak (1978) device under conditional normality. In this specification, the time average is often used to save on degrees of freedom.

<sup>14</sup>In order to assess the macroeconomic policy stance based on a comprehensive set of complementary indicators, this study used a variant of the composite indicator introduced by Jaramillo and Sancak (2009). The version of this index that includes the black market premium was first used in Bal Gündüz (2009). The formula for the indicator is given by

$$mitot_{it} = \frac{\ln\left(\frac{cpi_{it}}{cpi_{it-1}}\right)}{\sigma_{\Delta \ln(cpi)}} + \frac{\ln\left(\frac{xr_{it}}{xr_{it-1}}\right)}{\sigma_{\Delta \ln(xr)}} - \frac{res_{it} - res_{it-1}}{\sigma_{\Delta res/mgs_{t-1}}} - \frac{\frac{gbal_{it}}{gdp_{it}}}{\sigma_{gbal/gdp}} + \frac{\ln(1 + blackpr_{it})}{\sigma_{\Delta \ln(xr)}}$$

where  $mitot$  is the macroeconomic stability index for country  $i$  at time  $t$ ,  $cpi$  is the consumer price index,  $xr$  is the exchange rate of the national currency with respect to the U.S. dollar (an increase indicates a nominal depreciation),  $res$  is the stock of international reserves,  $mgs$  is imports of goods and services,  $gbal$  is the government balance,  $gdp$  is the nominal GDP,  $blackpr$  is the black market premium, and  $\sigma$  is the standard deviation of each variable. Weights are inverses of the standard deviation of each component for all countries over the full sample after removing the outliers. Higher levels of  $mitot$  indicate increased macroeconomic instability.

**Table A1.2. Demand for IMF Financing in Response to Policy and/or Exogenous Shocks**

Current account balance to GDP ( $t-1$ )	-0.076*** (-4.61)
Reserve coverage in months of imports (CFA) <sup>1</sup> ( $t-1$ )	-0.478*** (-6.08)
Reserve coverage in months of imports (non-CFA) <sup>1</sup> ( $t-1$ )	-0.769*** (-8.71)
Macroeconomic stability indicator ( $t-1$ )	0.068*** (2.89)
Real GDP growth ( $t-1$ )	-0.113*** (-4.24)
Change in terms of trade ( $t-1$ )	-0.022*** (-2.8)
Change in real oil prices in previous two years	0.009*** (2.85)
Real world trade, cyclical component	-0.099** (-2.53)
Change in real non-oil commodity prices	-0.020 (-1.58)
Real growth of goods exports ( $t-1$ )	-0.009* (-1.79)
Paris Club dummy	0.774*** (3.24)
Constant	0.551 (1.23)
<b>Country-specific averages</b>	
Total debt service to exports	0.044*** (2.63)
FDI to GDP	-0.105* (-1.76)
Pseudo R <sup>2</sup>	0.58
LR test $\beta_2 = \dots = \beta_3 = 0$ $\chi^2$ (Prob)	376 (0.00)
LR test $\rho = 0$ $\chi^2$ (Prob)	11 (0.00)
Number of observations	532
Sample probability	0.44
Number of countries	55

Source: Bal Gündüz (2009).

Note: Demand for IMF financing in response to policy and/or exogenous shocks excluding natural disasters is estimated by a correlated random effects probit model. \*Significant at 10 percent, \*\*at 5 percent, \*\*\*at 1 percent;  $t$ -statistics in parentheses. Country-specific averages are calculated as the sample average of variables for each country. FDI = foreign direct investment; LR = likelihood ratio test.

<sup>1</sup>The CFA franc zone consists of 14 countries in sub-Saharan Africa, each affiliated with one of two monetary unions maintaining the same currency, the CFA Franc.

Gündüz reports that adverse global shocks to the change in real oil and non-oil commodity prices, and the cyclical component of world trade, increase participation in Fund arrangements. Therefore, the demand for Fund resources by LICs is likely to be cyclical in response to global conditions, with its intensity depending on the magnitude and persistence of adverse external shocks.

The ultimate objective is to distinguish the short-term impact of IMF-supported programs when a country has an immediate external financing need. The treatment variable is identified mostly symmetrically to the one used in the selection equation. A panel dummy variable taking the value of 1 for the

approval of IMF-supported programs with LICs addressing immediate balance of payments needs, and 0 for nonprogram episodes, is constructed as the treatment variable.<sup>15</sup> Refinements to the program and nonprogram episodes are made similar to those for the dependent variable in the selection equation. Within the set of program countries, a higher propensity score will identify the IMF-supported programs addressing a clear financing need. Severe state failure events are excluded from both program and nonprogram sets as the macroeconomic outcomes in these episodes will be frail, independent of the impact of IMF-supported programs.<sup>16</sup> Furthermore, in order to take account of program implementation, years of program interruptions are excluded from the sample.

<sup>15</sup> Some asymmetries compared to the dependent variable in the participation equation are introduced for nonprogram episodes to increase the common support for the PSM. The treatment variable includes nonprogram years followed immediately by an IMF-supported program and nonprogram episodes without IMF membership as zeros, whereas the dependent variable in the participation equation excludes these observations from the sample.

<sup>16</sup> The severe state failure events are identified from the Political Instability Task Force data set. Four types of political crises are included in this data set: revolutionary wars, ethnic wars, adverse regime changes, and genocides and politicides. Using this data set, a severe state failure event is identified when the variable *SFTPMAX* (the maximum magnitude of all events in a year) exceeds 3.9.

## Annex 2: Panel Regression on the Determinants of Long-Term Growth

The impact of IMF-supported programs on per capita GDP growth also addresses the selection issue and is computed using two-way fixed-effects models for panel data. All regression specifications control for the inverse Mills ratio to address the selection bias discussed above. The starting estimation does not control for macroeconomic variables that are considered possible transmission channels of the longer-term impact of IMF-supported programs. The analysis here focuses on the effect of longer-term Fund engagement on the long-term average real GDP per capita growth rate. The specification is the following:

$$(g_{it}) = \theta_2 IMF_{it} + Z'_{it}\beta + \epsilon_{it}, \quad (1)$$

where  $g$  refers to the real GDP per capita growth rate,  $Z$  is the matrix of control variables that are chosen not to be related to Fund engagement, and  $\theta_2$  measures the total effect of IMF-supported programs on the level of growth.

The study also assesses the strength of the transmission channels in the outcome equations by controlling for those channels and looking at the behavior of the coefficients associated with the longer-term IMF dummy. In order to assess the strength

of each transmission channel of Fund engagement, equation (2) is augmented with the variables  $Y$  that were significantly affected by the IMF-supported program dummy in the PSM estimation. The specification is then

$$(g_{it}) = \theta_3 IMF_{it} + Z'_{it}\beta + \alpha Y_{it} + \epsilon_{it}. \quad (2)$$

If the inclusion of a potential transmission channel variable  $Y$  lowers (in absolute terms) the magnitude and the significance of the coefficient associated with the IMF dummy, this will confirm that the variable  $Y$  is one channel through which IMF-supported programs help foster economic growth. One would then expect  $|\theta_3| < |\theta_2|$  along with changes in the significance of the two coefficients.

We use the generalized method of moments estimators developed for dynamic models of panel data that were introduced by Holtz-Eakin, Newey, and Rosen (1988), Arellano and Bond (1991), and Arellano and Bover (1995). These estimators are based, first, on differencing regressions or instruments to control for unobserved effects, and, second, on using previous observations of explanatory and lagged-dependent variables as instruments (which are called internal instruments).

**Figure A2.1 Macroeconomic Conditions in Low-Income Countries across Decades**

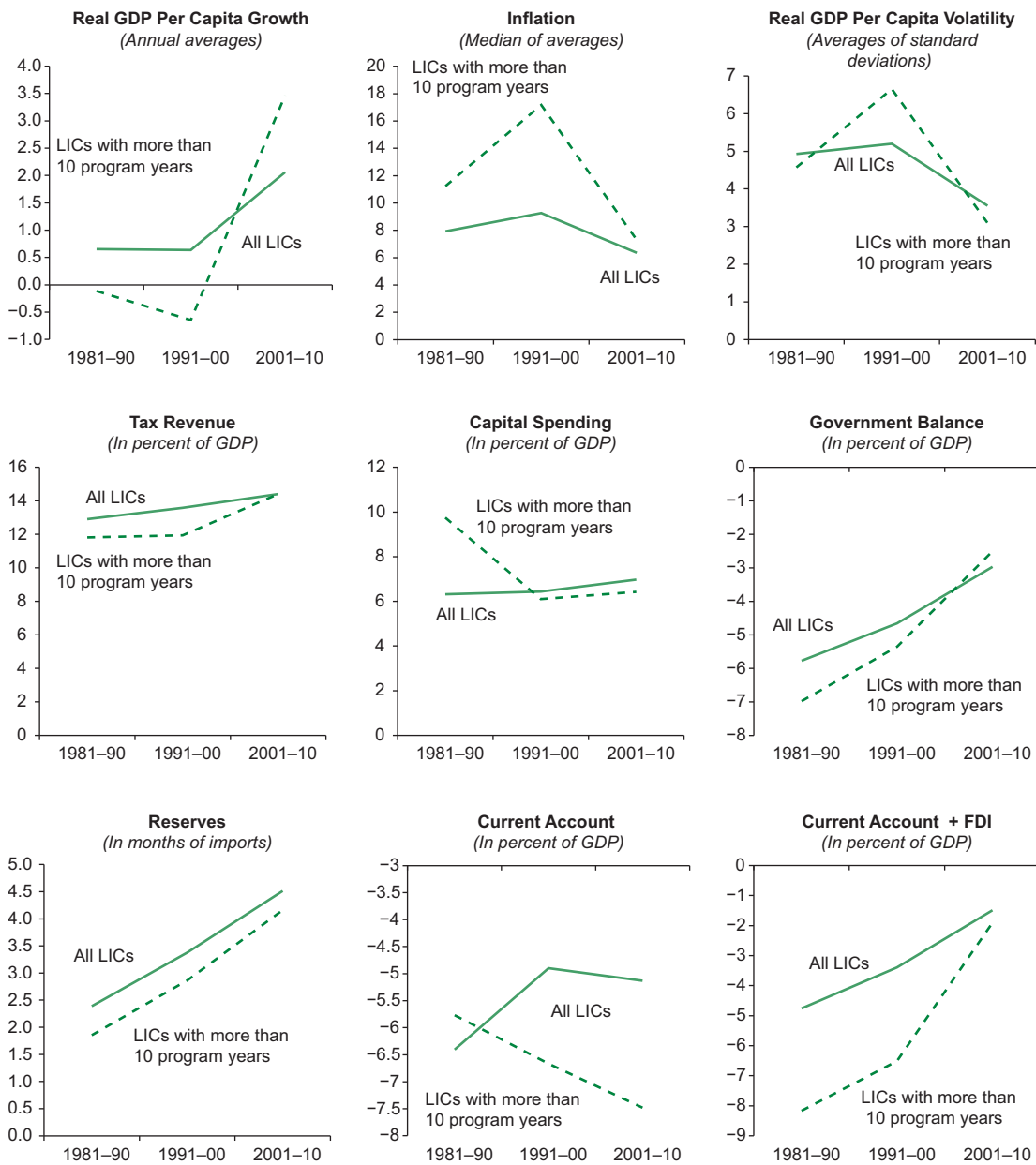
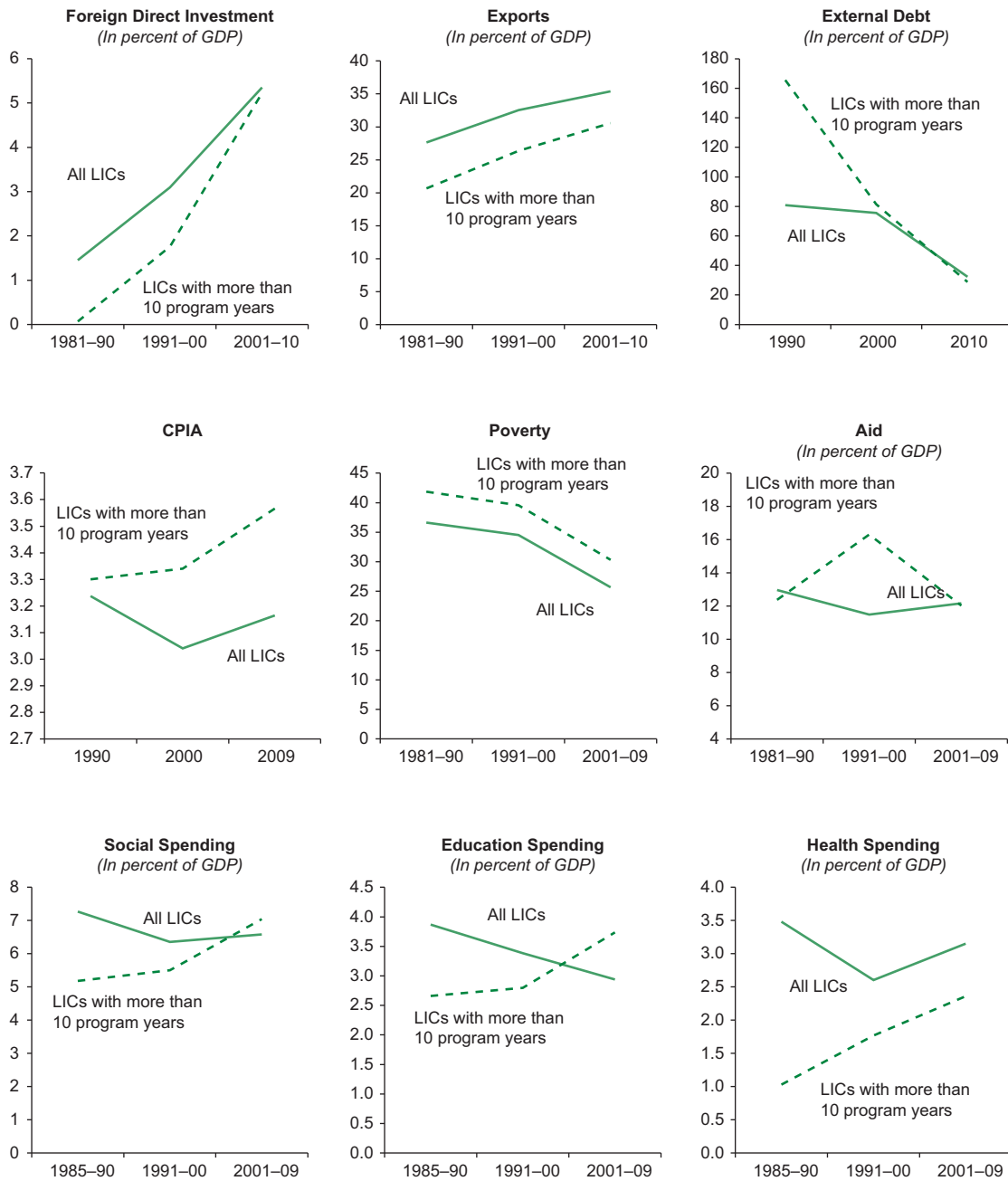


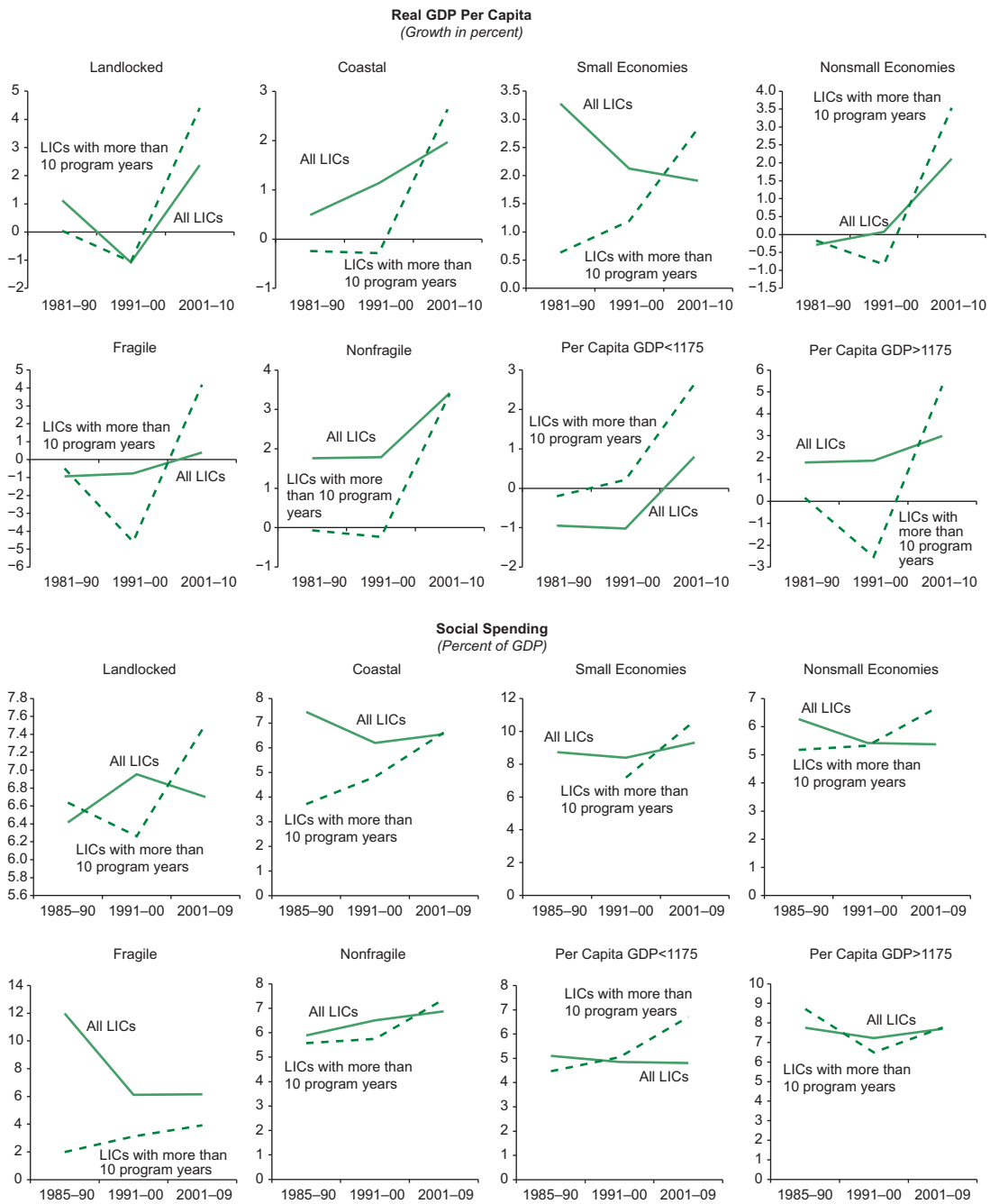
Figure A2.1 (continued)



Source: IMF staff calculations.

Note: The sample is composed of 75 low-income countries (LICs). Each value represents an unweighted average (except inflation, which shows the median) over each decade. Longer-term engagement is defined as 10 or more years of having an IMF financial arrangement or Policy Support Instrument in place during 1991-2010, for at least six months in each of these years. CPIA = Country Policy and Institutional Assessment; FDI = foreign direct investment.

**Figure A2.2 Macroeconomic Conditions in Low-Income Countries across Decades and Country Groupings**



Source: IMF staff calculations.

Note: The sample is composed of 75 low-income countries (LICs). Each value represents an unweighted average over each decade. Longer-term engagement is defined as 10 or more years of having an IMF financial arrangement or Policy Support Instrument in place during 1991–2010, for at least six months in each of these years.

Figure A2.3 Changes in Macroeconomic Performance of Low-Income Countries

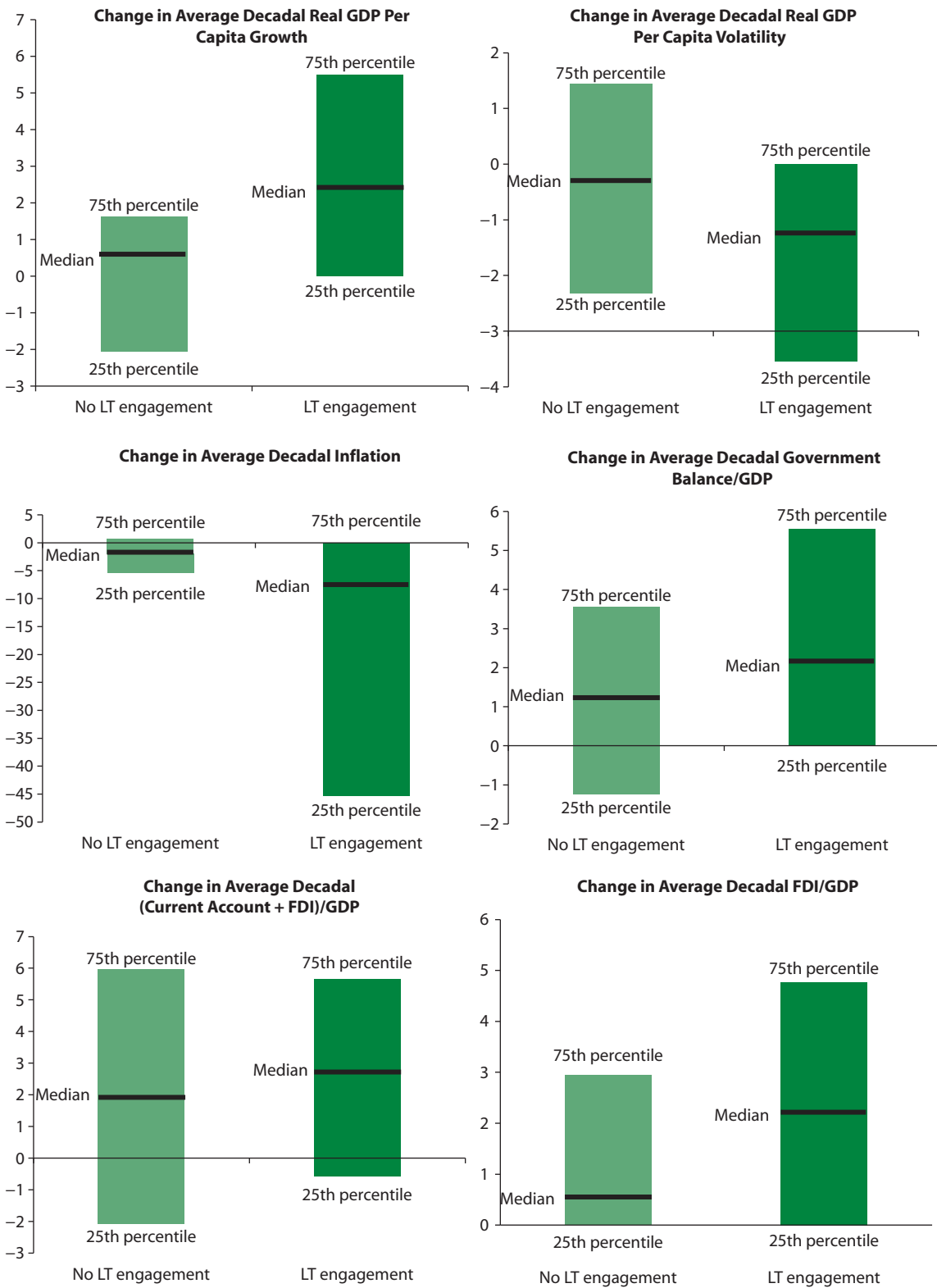




Figure A2.3 (continued)

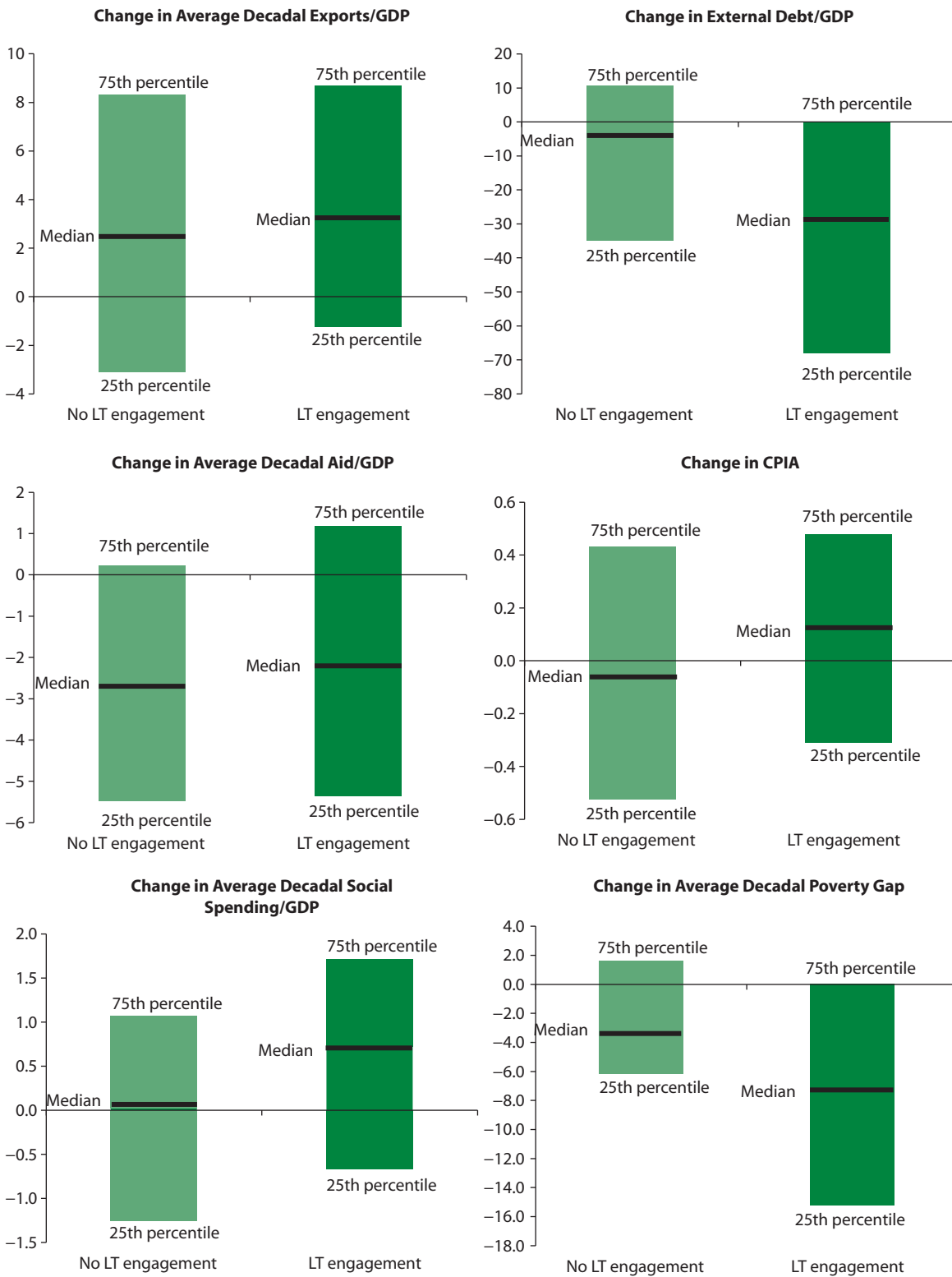
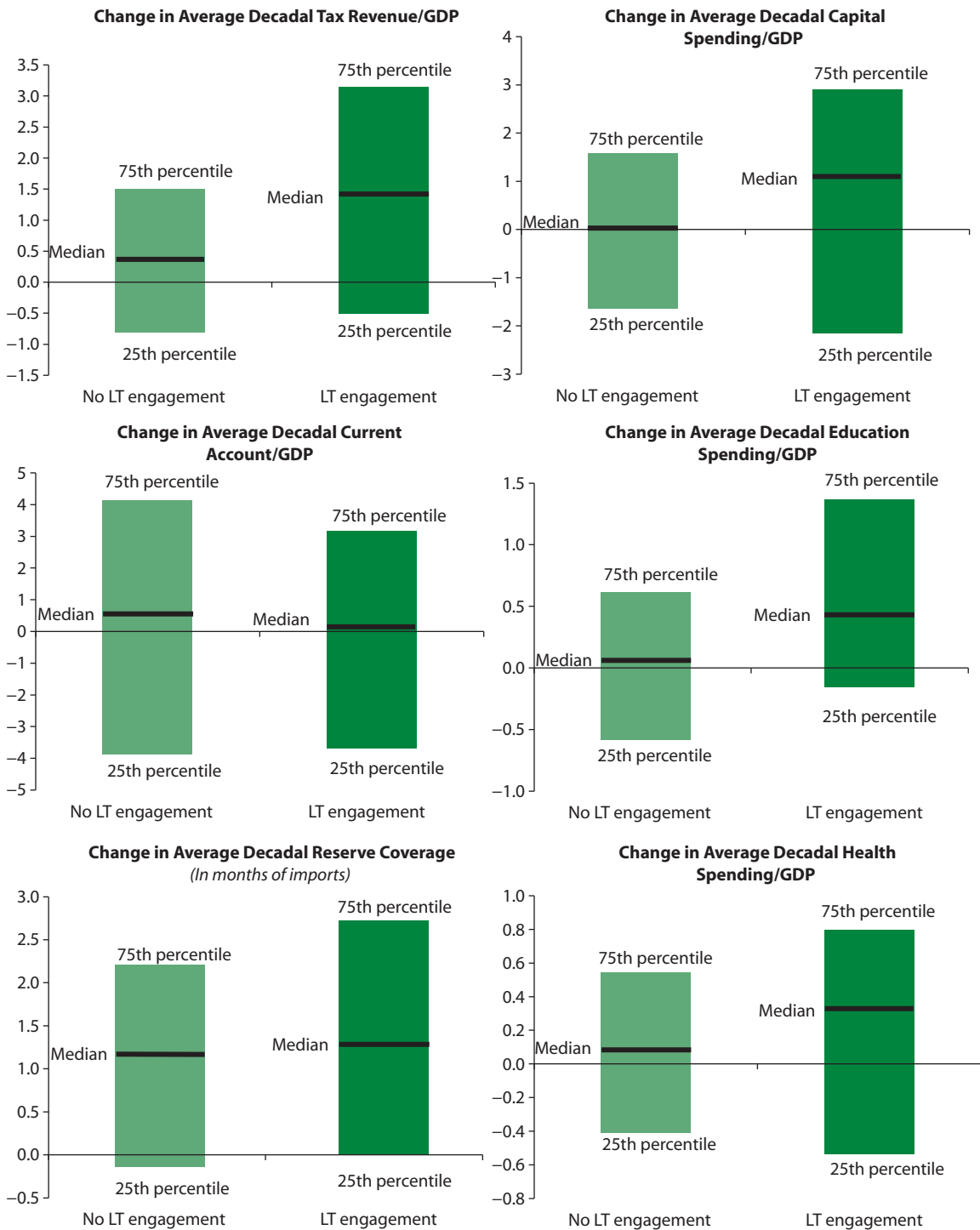


Figure A2.3 (continued)



Source: IMF staff calculations.

Note: The sample is composed of 75 low-income countries and four overlapping decadal period averages: 1986–95; 1991–2000; 1996–2005; and 2001–10. A country is considered to have longer-term (LT) engagement in a given decade if in five or more years it had a financial arrangement or a Policy Support Instrument in place, for at least six months in each of these years. The figure shows the distribution of decadal changes across countries by quartiles. CPIA = Country Policy and Institutional Assessment; FDI = foreign direct investment.

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