

The Effect of Fiscal Policies on the Quality of Growth

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Preface

In a recent report on middle-income countries, the Independent Evaluation Group (IEG) found that countries and the World Bank Group have been relatively effective in the overarching priority of promoting growth and reducing poverty, but not in addressing rising inequality, governance and corruption, or environmental degradation. Similar issues were raised in IEG's 2006 Annual Report on Development Effectiveness. Recent reports from the United Nations and other multilateral agencies such as the Asian Development Bank also document the concerns about these aspects of distribution and sustainability connected with growth. Following the analysis in "The Quality of Growth" (Thomas and others 2000), this report takes "quality of growth" to mean the type of economic growth that especially reduces extreme poverty, narrows structural inequalities, protects the environment, and sustains the growth process itself.

This is a challenging report on the development role of fiscal policy. It provides a multidimensional perspective on development—combining income growth, equity, and environmental quality. The report's concerns are at the core of the development policy debate. The underlying analysis combines a variety of data and methodological approaches—from standard cross-

country growth regressions to project data and country experiences. The report is intended to stimulate discussion in this critical area, particularly where the challenges from environmental and climate change problems, rising income inequality, energy subsidies in the face of rapidly rising energy prices, and widely uneven progress in combating poverty are becoming more serious.

This paper—requested by the Committee for Development Effectiveness and prepared as part of IEG's work program—considers how fiscal policies affect the key dimensions of *quality*. There are three reasons that such a focus is crucial. First, the sustainability of development results is fundamentally affected by the nature of growth. Second, fiscal policies have an especially important effect on the quality aspects of growth, such as inequality and environmental sustainability. Third, this approach allows us to draw from previous work on projects, sectors, and countries, using evaluation data and other data (cross-country), as well as to complement ongoing evaluation work on public sector reform, the environment, and climate change.

The findings presented in this report should be useful for evaluating development results. In

particular, those on the composition of spending and taxes could help in addressing the following questions:

- How have countries used fiscal policy (expenditures, subsidies, and taxes) to address inequality and environmental degradation, and how effective have they been?
- Which expenditures, subsidies, and taxes are best used to address inequality and to reduce

resource depletion and emissions? Which subsidies should not to be used?

It is the authors' hope that the findings from this work will lead to deeper consideration of both the quality and quantity dimensions of economic growth, especially in evaluations of development strategies and the resulting development effectiveness.

Acknowledgments

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The brief draws on work based on background technical studies by Ramón E. López and country studies by Sadiq Ahmed (India), Bert Hofman and Louis Kuijjs (China), Raj Nallari (Sub-Saharan Africa), Ramón E. López (Chile), Claudia Romano (Brazil), and Ann Elizabeth Flanagan (project analysis), with support from Houqi Hong, Asif Islam, Sebastian Miller, Máximo Torero, Sergio Sakurai, Shampa Sinha, and Bintao Wang.

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Summary

The world faces unprecedented opportunities to reduce global poverty and improve human welfare. Strong global growth and better economic policies in recent years have substantially reduced poverty in many developing countries. However, with the recent global financial turmoil and rising prices for food, oil, and other commodities, the world economy faces heightened risks and volatility. Policymakers around the world face the challenge of maintaining momentum in growth, as well as of improving the *quality* of growth. This concern over quality is reflected in the highly uneven reduction in poverty, rising inequality in numerous countries, and widening environmental degradation during the past decade—a period of unprecedented high economic growth in developing countries. Unless these issues are confronted, gains from growth are likely to be undermined, and the pace of growth itself will not be sustained.

Growth is clearly linked to reductions in poverty. But the strength of this relationship depends on the *quality* or nature of growth. Various studies show that some growth patterns systematically reduce poverty and inequality, but others do not (IEG 2008, 2007). And some growth patterns lead to underinvestment in human capital, overexploitation of natural resources, and degradation of the environment—patterns inimical to the sustainability of growth.

Following the analysis in “The Quality of Growth” (Thomas and others 2000), we refer to quality in light of aspects of growth that especially reduce extreme poverty, narrow structural inequalities, protect the environment, and sustain the growth process itself. Structural inequalities arise from, among other things, imperfect markets (especially for credit) and the privileges and transfers that states provide to special groups. Excluding some groups from opportunities to participate in productive activities represents an obstacle to creating wealth and improving human welfare.¹ Although it is difficult to measure the quality of economic growth, this brief makes an attempt to do so by using multiple indicators, encompassing long-term growth (chapter 3), poverty and distribution (chapter 4), and six indicators of environmental pollution (chapter 5).

How Fiscal Policies Matter for the Pace and Quality of Growth

Fiscal policy is one of the most powerful instruments that governments use to maintain macroeconomic stability for growth, as well as for intra- and intergenerational transfers of wealth and for correcting market failures. Governments often have at their disposal between 25 and 40 percent of national income for spending, including redistributions across social groups. The literature has studied the

effects of trade policies, exchange rates, and the macroeconomic impacts of fiscal spending.² However, it has been less focused on the allocative effects of government spending, taxes, and subsidies on the pace and the quality aspects of growth, such as poverty/inequality and the environment. Few analysts have studied the impact of fiscal policy on the environment.³

The background work for this brief found that the composition of government spending matters for both the pace and the quality of growth. Here we differentiate between government spending on *public goods* and *private goods*. Public goods are defined broadly to include expenditures that complement rather than substitute for production in the private economy. Where certain markets fail (for example, credit markets imperfections, environmental externalities, and others), government expenditures targeted at mitigating the negative consequences of such failures are considered public goods. Among these are direct cash or in-kind transfers to financially distressed households, as well as expenditures for basic education and health, social security, public infrastructure, institutional development, law and order, and others. Expenditures that provide spillover benefits, such as on basic research and on environmental protection and natural resource management—areas in which the private sector tends to under invest⁴—also fall into this category.

Expenditures on private goods (production) or nonsocial subsidies include those that substitute for, rather than complement, production by the private sector. Often, these subsidies tend to distort markets; that is, unlike expenditures in public goods, they exacerbate market failures or create new distortions. Such subsidies include commodity subsidies (for example, energy subsidies and agricultural subsidies), corporate subsidies, credit subsidies, credit guarantees, and many other ad hoc schemes that are often targeted at special interest groups. Many investment subsidies, for example, are not across the board but instead discriminate in favor of certain industries or firms that are often selected on the

basis of successful lobbying efforts. In general, subsidies for private goods—much more than expenditures for public goods—are the object of political lobbying, often involving relatively expensive and directly unproductive activities.

Government spending on pro-poor programs can reduce poverty, as in conditional cash-transfer programs in Mexico, Brazil, Indonesia, and other countries. It can also provide such public goods as research and development infrastructure, basic education and health, and natural resource management—goods that the private sector would not provide. Fiscal policy, however, is deeply entrenched in the political economy, with subsidies and tax exemptions often captured by elites. So, despite their potential for promoting better quality growth, fiscal interventions, when misguided, can do more harm than good.

The empirical evidence supports the idea that the composition of government spending and the institutional and governance setups in a country matter greatly for the quantity and quality aspects of economic growth. The following three findings are interrelated.

First, government spending on *public goods* is strongly associated with faster economic growth as well as with greater poverty reduction. In other words, more spending on public goods (as broadly defined above) is linked to accelerated economic growth and reduced poverty. In contrast, government expenditures on private goods and on subsidies to firms that distort markets (for example, energy subsidies), as opposed to public goods, are associated with weaker economic growth and greater structural inequality. Country and project studies corroborate this evidence (see table A in box 3.1 and box 3.2). Therefore, reallocating government expenditures from private goods to public goods, even while keeping total government expenditure constant, could be associated with higher and better growth.

Second, government spending on public goods is also positively and significantly related to

environmental quality. In general, a shift in the composition of government spending toward public goods and away from private subsidies is associated with improvements in the quality of the environment, as measured by air pollution indicators. This argues for reallocating government spending away from subsidizing the kinds of private goods that provide perverse incentives and lead to resource depletion and toward providing more public goods.

There is a long way to go, though, before public goods are favored in fiscal policy. For example, the world spends a quarter of a trillion dollars a year on energy subsidies, thus providing incentives to waste energy, increase greenhouse gas emissions, accelerate climate change, and damage human health. And the several hundred billion dollars spent on agricultural subsidies are captured mainly by a small subset of the wealthiest producers, thus reducing welfare in low-income countries. Similarly, water for agriculture is underpriced in most countries and leads to greater waste of this resource. Globally, overuse of freshwater, estimated at 5–25 percent, is rapidly depleting the supply.

Third, the nature of tax policies also affects the quality of economic growth. Latin American examples show how tax loopholes and evasion benefit mainly the well-to-do, and how dependence on indirect taxes increases the tax burden on poorer households. Taxation of natural resource rents is another important area requiring the attention of policy makers. For example, by failing to tax rents on natural resources, many countries miss an important source of tax revenue that causes little economic inefficiency. There is a heated debate on direct versus indirect taxation. Some argue that in many countries, corporate income tax exemptions are provided to foreign investors in selected regions or sectors. Shifting some of the tax burden from indirect taxes to direct ones is therefore likely to not only improve equity but also to help reduce economic inefficiencies, given that such taxes tend to exacerbate the inefficiencies arising from credit market failure. Others have argued that indirect taxes may be less distortionary than

labor and income taxes. Given that the existing empirical work has not provided conclusive results, this brief calls for a pragmatic approach, on a case-by-case basis, regarding the appropriate balance between direct and indirect taxes.

Tax policies need greater attention for addressing the pressing issues of environmental degradation. For example, taxing the rents of natural resources has received little attention, even though it is an efficient way of raising revenues. *The Stern Review* calls for price-driven instruments, such as carbon taxes and tradable quotas (Stern 2006). Kyoto protocols provide a framework and the Bali Summit provides a road map, and there has been progress on carbon trading, but the design issues regarding these carbon taxes and the political economy of implementation are far from being resolved. As countries seek greener fiscal policies, there is scope for more analysis and follow-up on improved tax policy frameworks for sustainable development.

What All This Might Mean for Countries and Donors

Few policy instruments can affect both the quantity and the quality of growth—fiscal policy can. Encompassing government expenditures, taxation, and subsidies, all of which affect prices and disposable incomes, fiscal policy is perhaps the most contentious area of economic policy, heavily influenced by factors deeply seated in a country's sociopolitical environment and institutions. This study is an initial attempt to shed light on a policy framework that countries might consider for improving their quality of growth.

- *Restructuring government spending.* This study confirms that government spending in public goods is associated with higher and better growth. In other words, more spending on public goods at the margin may be associated with accelerated growth, reduced poverty, and improved air quality. The expenditures could be restructured and transformed into effective instruments for reducing poverty, narrowing structural inequality, and promoting environmentally sustainability. To do this requires reallocating government

spending away from subsidizing private goods and toward providing more public goods, even while total government spending is kept constant, to ensure macroeconomic stability. This implies reducing perverse subsidies and reallocating public expenditures at the margin. It does not mean that government could select a growth trajectory that is not consistent with its comparative advantages. Structural inequality could be narrowed by mitigating the effects of market imperfections and reducing the influence of interest group lobbies.

- *Reforming tax systems.* Plugging loopholes, reducing tax evasion, and fairly taxing rents from natural resources can make the tax system more efficient and less dependent on indirect taxes. Once public spending becomes more consistent with the objectives of economic growth, social equity, and the environment, the tax base could be broadened. New taxes and tradable quotas may be needed to establish the right prices for natural and environmental capital, thus generating more government revenue while providing the right incentives for reducing greenhouse gas emissions. Adequate taxation of rents from natural resources could be a priority. International coordination on tax systems is critical because capital flows easily across borders, and the international financial institutions can play a crucial role in standardizing tax codes.
- *Providing public goods.* With an increased revenue base, countries could then embark on a second round of providing more public goods, while ensuring fiscal sustainability. This second round could include more investment for improving institutions and property rights and reducing the impact of imperfect markets on efficiency and inequality. It could also include increasing the efficiency of government expenditures, which in turn would allow for raising the quality of education, health care, social protection, crime prevention, and infrastructure services. Other public goods include resource management, pollution control and abatement, and the adaptation of low-emission technologies.

The measures described above can be used for evaluating the effectiveness of financial and technical support provided by international financial institutions and other donors to developing countries:

- It would be valuable to conduct more analytical evaluations of government spending as part of the periodic reviews of public expenditure, particularly the split between spending on private subsidies and on public goods. Incidence analyses on beneficiaries of private subsidies and of tax exemptions would also be useful, as this is related to policy captures by higher income groups.
- There should be increased emphasis on the evaluation of tax systems, particularly in documenting tax evasion and efforts to reduce it. Progress in eliminating tax loopholes, especially the most regressive ones, and in increasing the tax base to ensure fiscal sustainability, including studies of the impact of indirect taxation on economic efficiency, needs to be assessed as well.
- There is also a need to assess whether countries attain a fair share of the rents from natural resources and what countries are doing to reduce environmental degradation and enforce environmental regulations. It would be useful to provide more analysis on the best practices on greener tax and other fiscal policies for environmental sustainability.

The remainder of this report follows: chapter 1 provides an overview of the quality aspects of growth; chapter 2 provides a conceptual framework for the analysis; chapter 3 presents the key evidence that fiscal policy matters for faster and better growth; chapter 4 discusses the link between the composition of taxes and expenditures, on the one hand, and poverty and income inequality, on the other; chapter 5 presents the results on fiscal policy and the environment, and chapter 6 gives the conclusions.

Notes

1. Many other dimensions of quality can be considered, including the nature of health outcomes, level and variability of nutrition, macroeconomic fluctuation and volatility of growth, prevalence of

crime and violence, and so forth. We have focused on poverty and income distribution and environmental sustainability as overarching attributes which, in turn, are also reflections of other aspects of quality. Especially given the limitations of time and resources, such a restricted focus on quality indicators may be justified. For a broader analysis on growth, see forthcoming work by the Growth Commission, led by Professor Michael Spence, at <http://www.growthcommission.org>.

2. The macroeconomic impact of fiscal deficits, though crucially important to growth and investment climates, is not the focus of this study because it has been the topic of many cross-country analyses on growth. See, for example, Perotti (2007), Serven (2007), Easterly, Irwin, and Serven (2007), Easterly and Rebelo (1993), Fischer (1993), and Levine and Renelt (1992), among others.
3. There are a few recent studies (such as IMF 2008) using simulations, but empirical work is rare.
4. The term *public good* is often used to refer to goods that are nonexcludable and noncompetitive. This means that it is not possible to exclude individuals from the good's consumption, and that each individual's consumption of the good leads to no subtractions from any other individual's consumption of that good. Due to difficulties in defining property rights and in pricing them, public goods are subject to market failures, where a noncoordinated market tends to undersupply such a good. The term *government spending on public goods* is broadly defined to include spending on education, health, social security, transport, communication, public order and safety, and housing and community amenities.

CHAPTER 1

How the Quality of Growth Matters: Overview

Economic growth is positively related to poverty reduction and many attributes of human well-being. But experience shows that some growth patterns reduce poverty more effectively than others (IEG 2008, 2007).

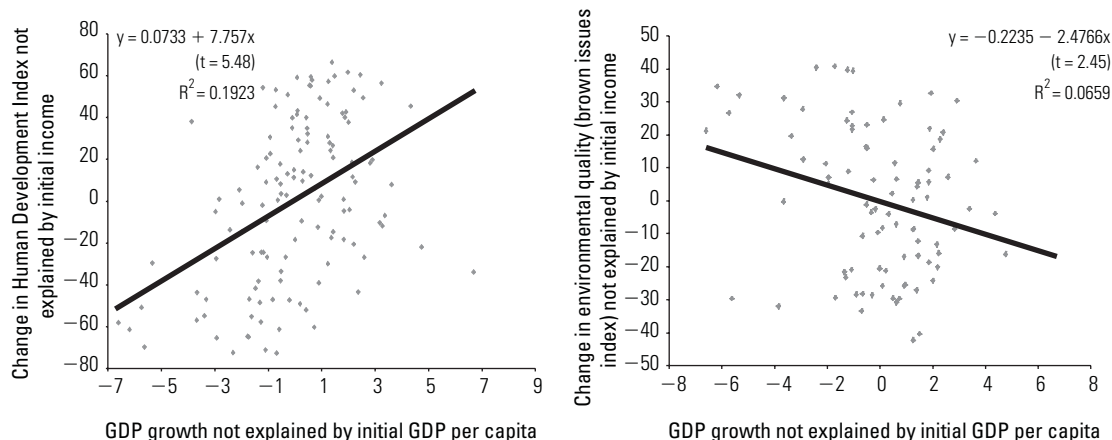
And some growth patterns lead to overexploitation of natural resources and environmental degradation. Constructing indices for human development and environmental quality, based on data from 128 countries, we see that per capita income growth is positively related to human development, but negatively related to the environmental quality, while controlling for initial income per capita (figure 1.1).

Both pace and quality of growth are crucial to better development results. “The Quality of Growth” laid out the more pertinent quality aspects of growth: as poverty is reduced, social equity increases, environmental degradation stops, and growth is sustained (Thomas and others 2000). Describing the interrelationships

among human capital, physical and financial capital, and natural and environmental capital, balanced investments in all three assets are seen as essential for ensuring faster and better growth. Underinvestment in human capital and overexploitation of natural capital are harmful to the quality of growth.

Studies have shown that the patterns of growth matter for poverty reduction (Ravallion and Chen 2004; Loayza and Raddatz 2006; World Bank 2005b). Despite the centrality of the quality of growth, inadequate attention has been paid to equity and environmental sustainability (see box 1.1). Country success is almost exclusively defined by the rate of economic growth and growth policies. What is needed is an integrated

Figure 1.1: Growth, Human Development, and Environmental Quality



Source: World Bank data from 128 countries in the World Bank's Global Development Finance and World Development Indicators central database for 2007.

Note: The relationships shown here control for the initial gross domestic product per capita.

approach measuring and linking the dimensions of growth. Correctly measuring gross domestic product (GDP) using “green” accounting and national wealth is an effort in the right direction, but operational applications must follow.

This brief explores the linkages between fiscal policy and the quality of growth. It takes “quality” to refer to the type of economic growth that reduces extreme poverty, narrows structural inequality, protects the environment, and hence sustains the growth process itself. Consistent with the World Bank’s World Development Report on equity and development (World Bank 2006d), we focus on structural inequality, which

originates in the imperfections of markets and of government policy failures and which often excludes low-income groups from obtaining basic education and health care and from participating in economic opportunities. High-quality growth requires narrowing structural inequality, but not necessarily reducing nonstructural inequality, which can often be part of the market incentives to investment and growth.

Demand for high-quality growth is strong. In China, after decades of rapid growth and poverty reduction, the quality of China’s growth is now considered more important than its speed. In 2007, Chinese Premier Wen Jiabao labeled the

Box 1.1: Inadequate Attention to Inequality and the Environment

Recent reports by the Independent Evaluation Group (IEG) found that inadequate attention was paid to equitable and sustainable growth. “Strategies designed solely to boost overall growth may miss opportunities to reduce poverty more effectively. In the countries reviewed by IEG, where growth did not result in poverty reduction, growth was concentrated in sub-sectors with low labor intensity and where few of the poor could work... The Bank has found it challenging to help countries formulate and implement strategies that effectively reduce rural poverty” (IEG 2007, p. xii).

Income inequality is a pronounced and worsening problem in some middle-income countries (MICs). There are 18 MICs—all in Africa and Latin America—with Gini coefficients higher than 0.50, well above the global average. In more than half of MICs, inequality has worsened over the past decade. Bank publications, including the *World Development Report 2006* and the regional report, *Inequality in Latin America and the Caribbean* (World Bank 2003b), have highlighted this issue. Yet, although many country assistance strategies show awareness of the topic and indicate that the Bank’s work will pay attention to the problem, the Bank has not yet succeeded in helping those clients deal with the problem convincingly (IEG 2007).

Even in high-growth countries such as China, “the Bank’s programs (fiscal 1993–2002) did not do enough to address inequality” (IEG 2007, p. 25). And policy dialogues on fiscal decentralization issues have not been entirely effective. “The Bank has been less successful in persuading the government of the implications of broader

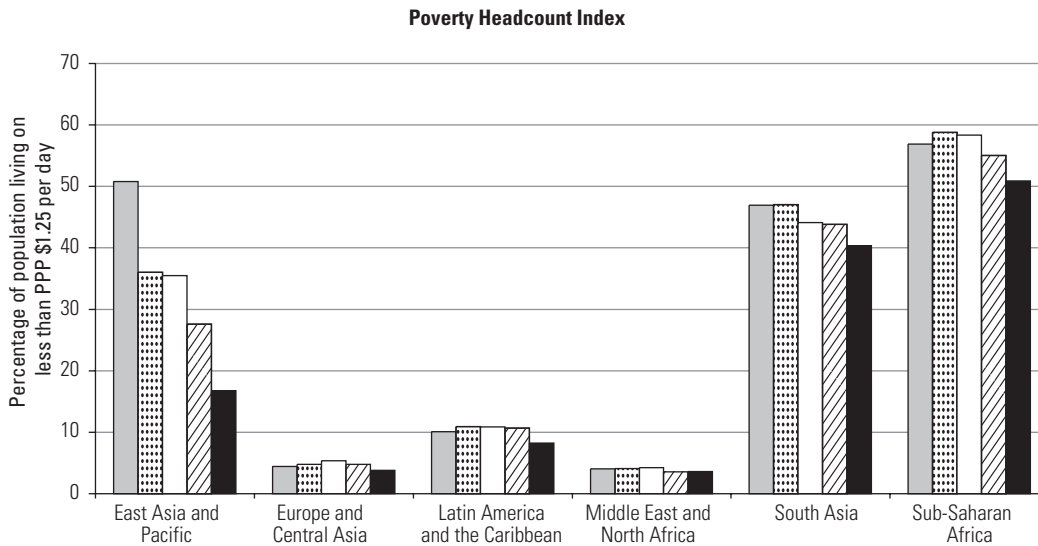
development policies for poverty and inequality. The mismatch between intergovernmental fiscal resources and responsibilities has exacerbated regional inequality” (IEG 2007, p. 9). When governments in poor regions were forced to provide fewer and lower-quality social services because of inadequate fiscal transfers, and thus passed along a higher proportion of the cost to their constituents, the outcomes were regressive (World Bank 2003c).

In India, the Bank supported the reforms of the early 1990s. And in the late 1990s it sharpened its focus on poverty reduction and governance. “Overall, however, the Bank had limited impact on fiscal and other structural reforms and failed to develop an effective assistance strategy for rural poverty reduction through much of the 1990s” (IEG 2007, p. 9).

On the environment, high-income countries remain the largest emitters of carbon dioxide, but three-quarters of MICs have increased their emissions since 1995, including China, which is now the world’s largest emitter. MICs account for nearly 60 percent of the world’s forest area, and 4 of 10 MICs have experienced deforestation since 1990; among them are Brazil, Indonesia, Mexico, and the Philippines. Bank lending for projects mapped to the Environment Sector Board in MICs has risen, but these projects have performed less well than projects in other sectors. Nearly one-third of such projects—with combined commitments of \$892 million—had outcomes that were moderately unsatisfactory or lower, making it the worst performing sector by a large margin (IEG 2007).

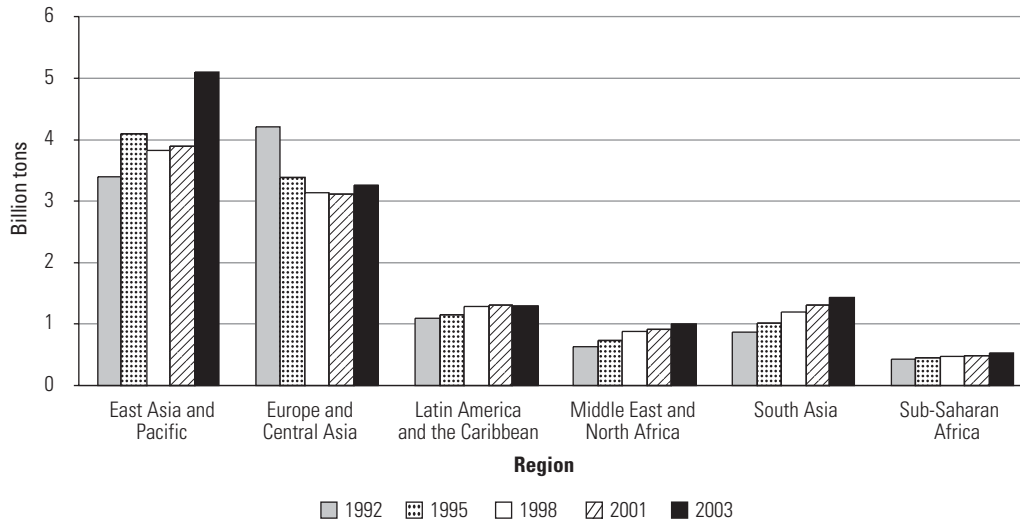
Source: IEG (2007).

Figure 1.2: Poverty Reduction, by Region



Source: World Bank database (September 2009).
 Note: PPP = purchasing power parity.

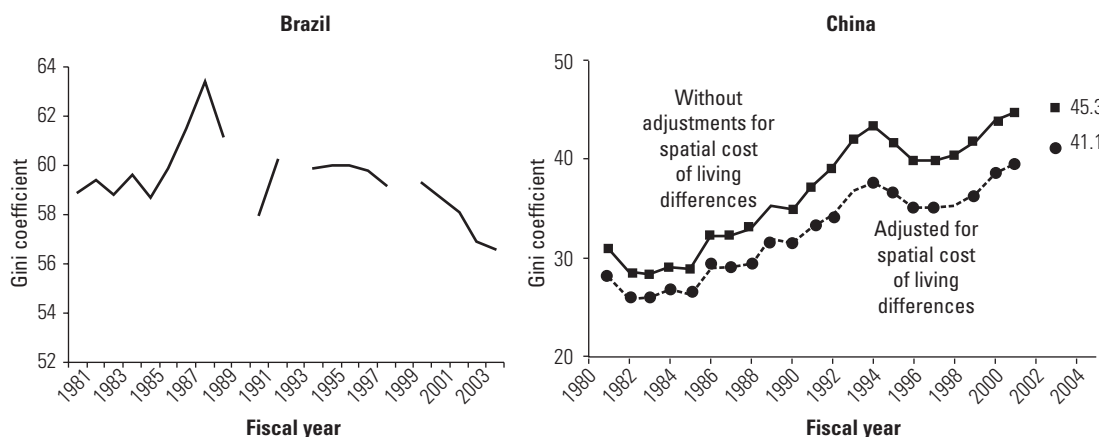
Figure 1.3: Carbon Dioxide Emissions, by Region



Source: World Bank database.
 Note: These carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacturing of cement and gas flaring. It does not include carbon dioxide from forest and agricultural emissions.

economy “unstable, unbalanced, uncoordinated, and unsustainable.” As regional income disparities have widened and income inequality has worsened, the leadership has adopted several

fiscal policy measures to achieve more balanced, inclusive, and sustainable growth (Hofman and Kuijs 2007). On March 18, 2008, Wen Jiabao vowed, once again, to reform the fiscal and tax

Figure 1.4: Income Inequality Declining in Brazil and Rising Rapidly in China

Source: Romano and Sakurai (2007); Hofman and Kuijs (2007).

system to achieve “social fairness and justice” and to build “a people-centered” harmonious society.

In India and Latin America, as well as several countries in Sub-Saharan Africa, “jobless growth” has been at the center of public debates. In Chile, students took to the streets in 2006 demanding better-quality education. Seeking high-quality growth is specified in the Vietnam Development Report and in the country’s Five-Year Plan. Indonesia took decisive steps to reform its fuel subsidies in September 2005 and to compensate the poor by implementing a massive conditional cash-transfer system (Granado and others 2008).

Quality of Growth a Challenge in Many Parts of the World

Developing countries have had five consecutive years of fairly good economic growth, with average growth of 5.5 percent in 2004–06, excluding China and India. But huge challenges have arisen because of the subprime credit crisis in the United States—which has led to a global economic downturn—and rising oil and food prices, along with an increasing inflationary pressure. Long-term challenges remain: the varying pace of poverty reduction, rising inequality, and the continuing environmental degrada-

tion. Twelve fast-growing African countries saw average annual growth of 4.3 percent in 1990–2006, others saw peaks and valleys, and still others did not grow at all.

Rapid growth has helped to achieve remarkable poverty reduction in many parts of the world, led by Asia. But there are large regional variations (figure 1.2). Inequality has risen in more than half of the middle-income countries, with Gini coefficients above 0.50 in many of them. In China, Lithuania, Sri Lanka, Romania, and several Latin American countries, the positive effect of growth on poverty was dampened by worsening income distribution. In some countries where poverty increased, such as Bolivia and Georgia, negative household consumption growth was accompanied by an increase in inequality. Although growth accounted for most of the poverty reduction, even seemingly small changes in income distribution contributed substantially to the poverty effects of growth (IEG 2007). Meanwhile, carbon dioxide emissions are up in all regions, most notably in East Asia (see figure 1.3).

China has achieved the fastest economic growth and poverty reduction in the last three decades. The current growth pattern relies heavily on manufacturing and external demand and requires ever-increasing capital accumulation. Current trends show that the ratio of investment to GDP

would have to rise to more than 50 percent by 2020 and more than 55 percent by 2030 to achieve anticipated growth (Hofman and Kuijs 2007). The current growth pattern has also led to growing inequality. The accumulation of capital in urban industry widened productivity differences with rural areas, leading to large income inequalities. With an estimated Gini coefficient of more than 0.45, China now has greater inequality than the United States and the Russian Federation and is becoming more like Latin American countries in this respect (figure 1.4).

Although China has improved its use of natural resources and energy in some respects, environmental constraints on growth now loom large. As the largest producer of carbon emissions, China has 16 of the 20 cities with the most polluted air in the world. A recent World Bank study found that the health costs of air and water pollution in China amount to about 4.3 percent of its GDP. Adding the nonhealth impacts of pollution, estimated at about 1.5 percent of its GDP, brings the total cost of air and water pollution to about 5.8 percent of GDP (World Bank 2007b).

In Brazil, even with a low and volatile growth rate in the past decade, there has been a reduction in inequality. The country's Gini coefficient declined from 0.59 in the late 1990s to 0.56 in 2005, due in part to social programs and tax reforms. But one of the main environmental problems is deforestation. Deforestation rates in the Amazon have remained very high over the last decade and have shown significant annual fluctuations. Deforestation and land use changes account for 75 percent of Brazil's carbon emissions. Air pollution, poor drinking water, and other environmental risks cause an estimated 233,000 premature deaths each year (WHO 2006).

Rapid growth since the 1980s has placed India among the top nine rapidly growing countries in the world, but the pace of poverty reduction has been slow. Income inequality increased between 1980 and 2004, and human development indicators remain weak, by international standards. India's particular problem is its low employment elasticity of growth, which has been narrowly based on high-tech and skill-intensive sectors. There are widening wage differentials between sectors and genders. Moreover, a growing population, rapid urbanization, and growth have all taken a toll on India's natural environment. The estimated cost of environmental degradation is 5.8 percent of GNP—four times the 1.4 percent for high-income countries (Ahmed 2007).¹

Africa's recent growth is associated with varying rates of poverty reduction and changes in inequality. Poverty levels dropped in Burkina Faso during 1990–2000, in Ghana and Kenya during 2000–05, and in Madagascar during the early 1990s. However, levels have increased in Madagascar in the past few years because of negligible per capita income growth and an increase in income inequality. A simple correlation analysis shows that growth in these countries is positively associated with poverty reduction—and with income inequality. Inequality worsened significantly in Uganda, partly because of the slow growth in agriculture and partly because of inadequate job generation in other sectors (Nallari 2007).

Note

1. The adjusted net savings is obtained by first adjusting gross national savings, by allowing for depreciation of capital stock and then adding back spending on education, and subtracting losses of national wealth from deforestation, energy depletion, mineral depletion, carbon dioxide damage, and particulate emission damage.

CHAPTER 2

Fiscal Policies Matter for the Quality of Growth: Framework

A country has at least three types of assets that matter for production and welfare: physical capital, human capital, and natural capital. Technological progress and the policy environment affecting the use of these assets matter as well. Much attention has traditionally been given to the accumulation of physical and financial capital. However, for poverty reduction, what deserves greater attention are other key assets, such as human (and social) capital and natural (and environmental) capital, because these are the primary assets that the poor possess.

Physical capital contributes to welfare through economic growth. Human (and social) capital and natural (and environmental) capital not only contribute to growth, but they are direct components of welfare. Human capital and natural capital also help increase investment returns, thereby attracting more capital and making the investment more productive. Accumulation of all three types of capital is crucial for balanced and sustainable growth.

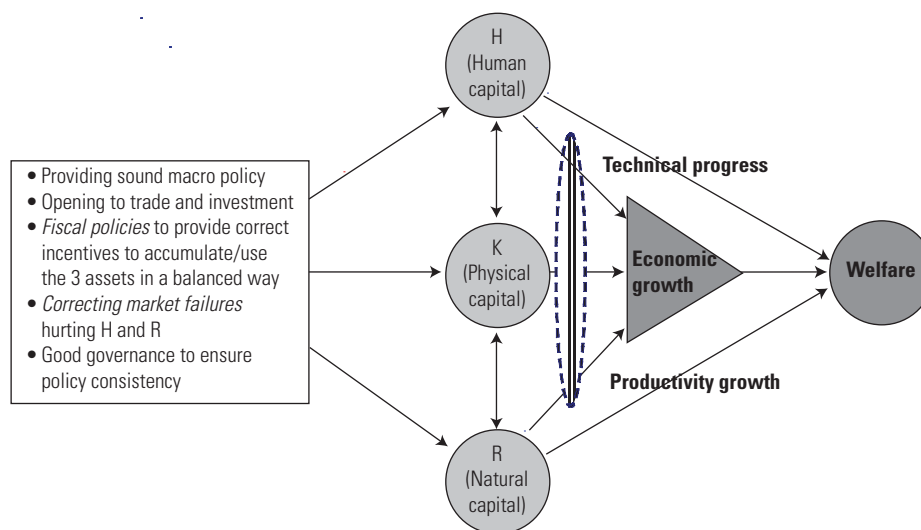
Market failures usually lead to underinvestment in human capital and overexploitation of natural capital. Such results affect the lower-income segments of the population disproportionately and tend to benefit a minority of the population. Market failures are, therefore, a key source of structural inequality, which, in turn, is detrimental to efficiency and growth. In many countries, governments have failed to offset market failures by adequately providing basic services, especially to the poor. Because the benefits of investing in education and health take a long time to materialize, governments do not have sufficient political incentives to invest in the poor's human capital. Instead, they have contributed to structural inequality by using scarce budget resources to subsidize and provide tax exemptions for often wealthy segments of the

population. Figure 2.1 is a schematic illustration of this framework, showing the role of fiscal policy.

Why the Focus on Fiscal Policy?

First, fiscal policy is important for allocating resources to maintain a balance between the three key assets of the society: human capital, physical capital, and natural capital. The accumulation or depletion of these assets depends on the incentives created by tax policies and resources allocated through expenditure policies. Government expenditures often constitute more than 30 percent of GDP. Fiscal policy is therefore a powerful instrument, capable of affecting the orientation of asset accumulation and economic growth in dramatic ways. Second, fiscal policy is powerful enough to influence macroeconomic expansion and contraction and to affect intergenerational transfers through debt, social security, taxation on extractable resources and pollution, and subsidies and expenditures on mitigation and adaptation.

Third, fiscal policy is a weak link influencing global public goods or "bads" and assets and liabilities. It is also deeply entrenched in political economy and governance, because subsidies

Figure 2.1: Framework for Equitable and Sustainable Growth

Source: Thomas and others (2000).

and tax exemptions are often driven by the capture by elites. Therefore, despite their potential for promoting better quality of growth, fiscal interventions may actually do more harm than good for quality of growth, in practice. For example, existing subsidies (such as energy subsidies) often provide perverse incentives for resource extraction, depletion, and greenhouse gas emissions, leading to environmental degradation.

The framework for this study is related to three bodies of literature: (i) a large body of literature linking fiscal policy and long-run growth; (ii) the literature on the growth-poverty-inequality nexus; and (iii) a small but growing literature on taxes, subsidies, and government expenditures and the environment.¹

Different types of government expenditures and different types of taxes may have very different effects on growth (Tanzi and Zee 1997). Several models have shown various mechanisms by which proper fiscal policies can be effective in promoting growth within an endogenous growth framework (Barro 1990; Jones, Manuelli, and Rossi 1993). The allocation of public expenditures is likely to affect whether public

expenditure is productive or not (Devarajan, Swaroop, and Zou 1996; Agénor and Neanidis 2006). New growth theory stimulated studies that attempt to test the relationships between public expenditures and economic growth. Empirical evidence on the relationship between composition of government expenditure and growth, however, is neither conclusive nor robust. The distributional impact of tax loopholes and exemptions has been largely ignored until recently (Furman, Summers, and Bordoff 2007; see box 2.1 for details.)

Main Hypothesis and Taxonomy

This paper focuses on the linkages among fiscal policy and growth, poverty, inequality, and environmental sustainability. The main hypothesis is that the composition of fiscal expenditures matters for growth, for poverty reduction and inequality, as well as for environmental sustainability. An exogenous reallocation of government expenditures from private to public goods, if it can be sustained over time, promotes faster and more inclusive and sustainable growth. To guide our assessment, we developed a framework or taxonomy of government policies. For simplicity, we classify government policies into two types of

interventions: A and B. (See López 2007a for a formal model).

Type A interventions emphasize the use of government expenditures to reduce the impact of market failure on the accumulation of assets, particularly human capital, knowledge, and the environment. These interventions are financed mainly through a reduction in expenditures, such as nonsocial subsidies, that tend to exacerbate market failure. Type A interventions are thus likely to promote sustainable growth, based on balanced investments in physical, human, and natural capital. The emphasis on the provision of public goods by the state helps increase the productivity of private investments. In addition, the focus of the public sector on providing environmental public goods promotes environmental sustainability. Finally, the reliance on social investments and other public goods, as well as on avoiding inefficient and unnecessarily regressive taxation, tends to reduce the structural component of social inequality. Also, according to an increasing number of recent studies, structural inequality hurts economic growth.

Type B interventions focus on (nonsocial) subsidies to private goods, which are often captured by the elites. Subsidies to private good—including commodity subsidies, credit subsidies, grants to corporations, loan guarantees, marketing subsidies, and others—are much more easily appropriated by the most powerful interests groups, which are able to lobby governments most effectively. These type B programs trigger the lobbying activity in the private sector. Therefore, even if the objective of programs is to promote small enterprises, for example, they instead tend to be appropriated by the economically powerful. This, in turn, causes further structural inequality and more directly unproductive activities associated with rent seeking. Finally, Type B interventions tend to distort markets when they are provided in the form of commodity market interventions (that is, farm, energy, and water subsidies).

It is estimated that the total amount of support to agricultural and food sectors worldwide

reached \$499 billion in 2001 (25 percent of which was direct domestic and export subsidies; the rest was import tariffs), causing huge welfare losses in low-income agrarian economies (Anderson, Martin, and Valenzuela 2006, p. 362). Agricultural subsidies are especially captured by a small subset of wealthy producers and intermediaries that is able to spend large amounts of resources to lobby government. Agricultural subsidies, therefore, increase economic inefficiency, contribute to increasing structural inequality, and induce more directly unproductive activity through rent seeking and crowding out of more productive expenditures from the government's budget. In India, food and water subsidies benefit the rural rich (see Ahmed 2007). In Africa, the rich benefit more from subsidies for fuel and kerosene, whereas “voice and accountability” mechanisms in the education sector can lower the capture of education subsidies by elites (Nallari 2007).

The world spends a quarter of a trillion dollars a year on energy subsidies, which provide perverse incentives for wasting energy and increasing greenhouse gas emissions (Baig and others 2007; Mati 2008; see box 2.1). In addition, such subsidies are expensive and badly targeted at protecting the poor from rising energy prices; much of the benefits go to higher-income groups. The top 20 percent of households received, on average, about 42 percent of the total energy subsidy, whereas the bottom 20 percent received less than 10 percent (Coady and others 2006; IMF 2006, 2008). Moreover, by distorting price signals, nonsocial subsidies can lead to severe misallocation of resources. They also lead to inefficient investment choices, locking in energy infrastructure and accelerating climate change.

Public and semipublic goods, as broadly defined above, are complementary with private investment because they tend to compensate for the scarcity of human and natural capital caused by market failure. Government provision of subsidies for private goods competes with the provision of public and semipublic goods because of limited or nonexistent fiscal

resources. This crowding out of government expenditures in public and semipublic goods leads to underinvestment in human and natural capital. Underinvestment reduces the marginal productivity of private investments as the private capital stock rises, thus increasing reliance on larger government subsidies to keep growth from slowing. In this case, economic growth is based more on capital deepening than on productivity growth.

Note

1. See, for example, Bourguignon (2005), Hoff and Stiglitz (2000), Ravallion (2004), Dasgupta (1996), World Bank (2005a, 2005b, 2006d, 2007c), Coady (2006), Schwartz and Ter-Minassian (2000), Serven (2007), López and Serven (2006), Loayza and Raddatz (2006), and Perotti (2007). On the environment, see OECD (2007), Bernauer and Koubi (2006), Lecocq and Shalizi (2007), Webb (2004), Stern (2006), and ongoing IEG work on public sector reform and governance on sustainable development, and on climate change.

Box 2.1: Brief Literature Review on Public Expenditures, Taxes, and Economic Growth

A large body of literature explores the relationship between public finance policies and economic growth. Evidence can be found for a variety of different hypotheses, occasionally conflicting (see reviews by Perotti 2007 and Serven 2007). The most widely supported hypothesis is that public spending in two areas—education and infrastructure—is positively correlated with economic growth. Contradictory evidence exists, however, in the case of infrastructure spending in developing countries. A recent study on public expenditure and growth estimated the impact of volatility of government spending on consumption. The welfare loss from the volatility of spending on consumption could be as large as 8 percent of consumption (Herrera 2007). Moreover, most literature to date has not considered the effect of governance on public spending outcomes.

Aschauer (1989) found that spending on core infrastructure (streets, highways, airports, mass transit, and so forth) had a positive impact on private sector productivity. Several other studies have found positive growth effects of public investment (Nourzad and Vrieze 1995; Sanchez-Robles 1998; Kamps 2004), with some evidence supporting the law of diminishing returns (de la Fuente 1997). Furthermore, several studies found that public investment can be productive if it creates infrastructure that serves as input to private investment (Devarajan, Swaroop, and Zou 1996).

The literature supports the growth-enhancing effects of expenditure on human capital if it is well targeted (Guellec and van Pottelsberghe 1999; Diamond 1999; de la Fuente and Doménech 2000; and Heitger 2001). Some studies, however, emphasize that public spending must complement, rather than crowd out, private spending (David, Hall, and Toole 2000). Consumption

and social security spending have generally been found to have either no effect or a negative effect on growth (Aschauer 1989; Barro 1990, 1991; Grier and Tullock 1989), although some studies (Cashin 1995) found a positive growth impact from welfare spending. For other categories of public spending, the evidence is even less conclusive.

There has been a long-standing debate on the interaction between taxation and economic growth. Using a panel of 23 OECD countries, Widmalm (2001) found that different taxes have different growth effects and that tax progressivity is bad for growth. The harmful effects of a progressive income tax structure were also noted by Padovano and Galli (2001, 2002) and Lee and Gordon (2005). The latter found that the marginal corporate tax rate was negatively correlated with economic growth in a cross-section of 70 countries during 1970–97, and other tax variables, including the average tax rate on labor income, are not significantly associated with economic growth. Kneller, Bleaney, and Gemmell (1999) found that an increase in productive expenditures enhances growth when the efforts are financed by nondistorting taxation, provided the size of the government remains relatively limited; however, an increase in distorting taxes reduces growth.

These studies, however, have not addressed the linkages between fiscal policy and structural inequality, or fiscal policy and the environment. Tax analyses have not distinguished between tax reductions that benefit all firms and tax exemptions that favor special interest groups. A recent study by the Brookings Institution is an exception: Furman, Summers, and Bordoff (2007) point out that one of the reasons for the rising income inequality in the United States is related to tax exemptions and loopholes.

Source: López and Miller (2007b); López and Torero (2007).

CHAPTER 3

Fiscal Policies Matter for the Quality of Growth: Evidence

Cross-country, project-level analysis and country studies come together to support the idea that the composition of government spending and institutional and governance set-ups in a country matter for the level and quality aspects of growth. In this and following chapters, we summarize the main findings of cross-country analyses linking government spending to growth, to poverty and inequality, and to the environment.

Spending on Public Goods Associated with Faster, Better Growth

This report's cross-country analysis of 29 mostly middle-income countries over 1980–2005 shows a large and significant positive relationship between government spending on public goods and economic growth, coupled with a mostly negative effect of total government spending on growth, when controlling for institutional, historical, governance, and geopolitical factors. This result is robust to changes in data, specifications, and estimation methods. So a reallocation of government spending from (nonsocial) subsidies to public goods, while keeping total government expenditure constant, should be associated with faster growth (López and Miller 2007b). Such an effect is partly due to the reduction of nonsocial subsidies and partly to an increase in the share of public goods.

The estimated relationship between increasing the share of spending in public goods and growth is unusually robust to multiple sensitivity tests. Care has been taken to collect data and address the econometric methodological issues. A multi-equation system approach was used to deal with the simultaneous interdependencies and potential two-way links between these two variables. The three-stage least squares approach was used in the regressions (table A in box 3.1), with institutional, political, geographic, and

macroeconomic control variables. Although the effect from the share of public goods to growth remains strong in all cases, the inverse effect from economic growth to the share of public goods is weaker, and in some specifications tends to be insignificantly different from zero, although always positive. This suggests that the causality most likely goes from public goods to growth and not the other way around. Sensitivity tests were conducted and results are robust—the share of spending on public goods remains positive and significant (see box 3.1).¹

What might lie behind this unusually strong correlation? Reallocating spending toward public goods seems to induce more balanced investment in human capital by reducing unproductive rent seeking and structural inequality. There are three benefits from doing so.

First, reallocation induces an increase in the rate of investment in human capital and knowledge by providing resources for households, which make these investments. A significant portion of households is financially constrained because of imperfections in credit markets that limit the investment in human capital. The increased financial resources available to households by increasing spending on public goods make the financial constraints on households less binding. *Second*, increasing government spending on public goods also

Box 3.1: Key Empirical Results, Data, and Methodology Issues

Many econometric studies have analyzed the linkages between various policies and economic growth; not all of them are equally convincing. The most cited problems are heterogeneity of effects across countries, measurement errors and omissions, and endogeneity. Among these issues, endogeneity is the most difficult. Econometric theory offers a number of possible solutions, including approaches called instrumental variables and multi-equation three-stage least squares. Some researchers use firm and household-level data, and avoid using cross-country analysis altogether.

Fully aware of these difficulties, the task team decided to use a “triangulation” of three methods: (i) cross-country analysis—because fiscal policy, in particular, must be analyzed at the country or cross-country level, firm and household-level data cannot re-

flect the whole picture; (ii) country studies—including state-level analysis for India; and (iii) project-level analysis—to study the composition of fiscal policy. The selection of countries was determined by the importance of quality of growth in the country’s agenda as well as feasibility considerations.

All three types of analyses have come together to support our main hypothesis that the composition of government expenditures matters for the level and quality of growth, to varying degrees. Table A shows one set of key regressions, and table B summarizes the data and estimation methods used to try to overcome the problems mentioned above, and includes the sensitivity tests conducted. Special attention has been given to the quality of data used and the potential two-way causality issues and sensitivity tests.

Table A: Share of Public Goods Matters for Growth: Three-Stage Least Squares System of Equations

Independent variable	Dependent variable Growth of GDP per capita	Share of government exp. for public goods in total government expenditure
Growth of GDP per capita		2.63** [1.318]
Share of government exp. for public goods in total government Expenditure	0.098*** [0.033]	
Total govt. consumption over GDP	−0.007 [0.026]	−0.139 [0.137]
Taxes over GDP	−0.078** [0.036]	0.429** [0.205]
Total investment over GDP	0.074** [0.037]	−0.390* [0.204]
Log of initial per capita GDP	−0.008*** [0.003]	
Inflation (CPI)	−0.001* [0.001]	0.003 [0.004]
Lag of log years of schooling	0.009 [0.007]	0.002 [0.030]
Years of democratic stability	0.002** [0.001]	−0.002 [0.005]
Corruption		−0.281*** [0.073]
% land in tropical areas	−0.012** [0.005]	
Malaria ecological index		0.064* [0.036]
Dummy Latin America	−0.019** [0.008]	0.218*** [0.029]

Box 3.1: Key Empirical Results, Data, and Methodology Issues (continued)

Independent variable	Dependent variable Growth of GDP per capita	Share of government exp. for public goods in total government expenditure
Dummy developed countries	0.003 [0.008]	0.006 [0.044]
Dummy East Asia	0.014* [0.008]	-0.073* [0.043]
Constant	0.037* [0.019]	0.605*** [0.102]

Source: López and Miller (2007b, annex 3.1).

Note: Small-sample standard errors in brackets; estimates include year dummies not shown in table; number of countries = 29; number of observations = 105.

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

Table B: Summary of Nine Background Studies: Data, Methods, and Sensitivity Tests

Reference	Data used	Main estimation methods	Sensitivity tests
1. López (2007b)	IMF Government Finance Statistics data were complemented by data from Asian Development Bank, country-level data and other data sources.	Both multi-equation three-stage least squares, and single-equation IV method are used.	A series of sensitivity tests, including bootstrapping—dropping one variable at a time, and dropping one country at a time. A sample dominance check was done.
2. López and Galinato (2007)	40 countries: Each country had at least two nationally representative household surveys during 1980–2005. The household income distribution data from these surveys were combined with national accounts data, as well as other political and institutional data.	(a) SUR-IV estimates for the four-equation system (four income groups). (b) Based on estimated coefficients, parameters can be approximated from the variance-covariance matrix.	Same methods applied to the full country sample, and to poor and MICs. Elasticities were calculated. Most results from the full sample are confirmed by the more disaggregated approaches. Both income and consumption were used as dependent variables and Wald tests were conducted.
3. López and Islam (2007)	GEMS data containing 31 developing and developed countries with annual data for about 300 sites in 86 cities during 1985–2000, combined with government expenditure data from above.	Two-way fixed effects (TWFE) method controlling for site effects and common time effects.	Estimation results are robust using different methods, including OLS, random effect, TWFE. Hausman tests were conducted.
4. Flanagan (Forthcoming) (box 3.2)	IEG's project evaluation data from more than 2,477 projects evaluated between 1980 and 2005. Two subperiods were used: the full sample period and post-1994 period.	Both logit and ordered logit were used for project-level analysis; instrumental variable for country-level analysis was employed for tests.	To test for reverse causation and other endogeneity, an instrumental variable approach was employed following Dollar and Levine (2005). The key results remain robust.
5. Ahmed (2007)	Expenditures at both levels of government: federal and state. In regressions, state-level expenditure is used.	IV and random effect, using state-level data.	Different model specifications were used and the key results remain robust.
Other country studies on Brazil, Chile, and China, and 12 African countries	Expenditure data used in figures include both levels of government: federal and state for Brazil, and general government for China. For Chile, data from budgetary central government are used.	No econometric analysis was done due to data difficulties.	N/A

Source: IEG.

Note: N/A = not applicable; IMF = International Monetary Fund; IV = instrumental variable.

means a faster rate of investment in infrastructure, knowledge diffusion, and the protection of natural resources. *Finally*, reducing the availability of government nonsocial subsidies reduces the incentives for the private sector to devote resources to unproductive rent-seeking activities and reduces commodity market distortions that curtail economic efficiency.

Spending on Public Goods and Efficiency of Spending

In government spending, what matters most is the provision of services, not just the levels of expenditures. Efficiency of spending and quality of service delivery are at issue. For example, part of the spending in education can be lost in excessive bureaucracy, corruption, and other types of inefficiency. More infrastructure spending is unlikely to spur economic growth in a bad policy environment. A major emphasis in economic transition in the Europe and Central Asia Region of the Bank has been on reforms to promote more efficient use of scarce resources through changes in ownership, pricing, collections, and safety nets to protect the poor.

The cross-country studies presented here focus on the impact of the share of spending on public goods in total government expenditure, not on the absolute levels (López and Miller 2007b). There is no prior reason to expect that the efficiency of the government, as a provider of all services, is any better than the efficiency of the government as a provider of public goods. What the empirical studies show is that, other things being equal, an increase in this share boosts economic growth and many other quality aspects of growth. If the government could also increase its efficiency, the dividends to such a reallocation could be even higher.

Other Studies Corroborate Results

The significant correlation between the structure of public spending and economic growth is corroborated by other studies using quite different datasets and approaches. One study of the rural sector in 15 Latin American countries

showed a similarly large effect of reallocated public spending toward rural economic growth (López and Galinato 2007). First, governments in Latin America spend a large proportion of their revenues on private goods (mainly subsidies) instead of public and social goods. On average, 51 percent of the government spending in rural areas was for subsidies to private goods. Brazil and Mexico have the largest share of expenditures allocated to private goods, at 87 percent and 66 percent, respectively. The average share of subsidies fell from 54 percent in 1985–89 to 46 percent in 1995–99.

Second, there is a negative and significant association between the share of spending on private goods and rural per capita income. Therefore, reducing spending on private goods but keeping total government spending constant would dramatically increase rural per capita income. Increasing total spending in the rural sector, in contrast, would have little impact on rural per capita income, likely reflecting the inadequate composition of rural public spending (López and Galinato 2007).

Growth analysis for India, using panel data from 11 states over 15 years, found results largely consistent with the cross-country analyses. The analysis suggests that the composition of spending matters for growth and poverty reduction. Spending on public goods, including health, education, and infrastructure, has a much larger positive and significant effect on growth, after controlling for state-level investment, trade openness, land-locked features, and other factors. This result is robust to changes in model specifications (Ahmed 2007).

Another study came to the same conclusion from an entirely different perspective. Using IEG's project evaluation data from more than 2,477 projects evaluated between 1980 and 2005, the study found that the share of spending on public social goods is positively and significantly related to World Bank project success, after controlling for such variables as trade openness, terms of trade, development aid, capital-labor ratio, and years of education (box 3.2; Flanagan, Forthcoming).

Box 3.2: Analysis of IEG’s Project Ratings Supports the Cross-Country Results

Sustained high-quality growth requires more than a high rate of investment or capital formation. It requires the right institutions, the right market incentives, and the right supportive investments (see, for example, Isham, Kaufmann, and Pritchett 1997; Isham and Kaufmann 1995; Kaufmann and Wang 1995).

Project Success Is Correlated with the Share of Spending on Public Goods

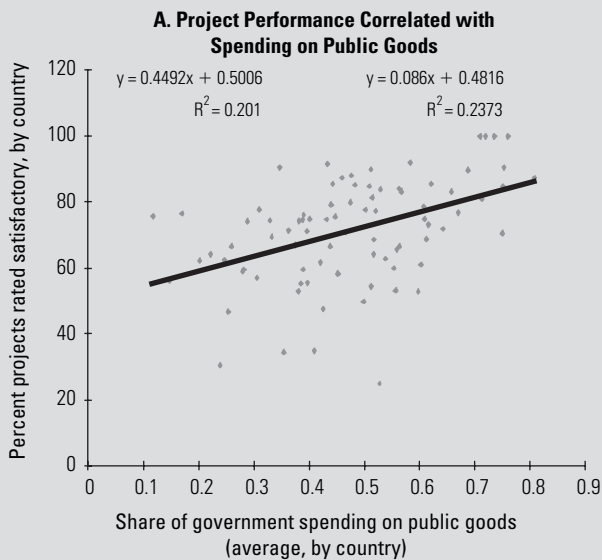
Countries allocating relatively more government resources to public goods had higher rates of satisfactory outcome ratings on World Bank projects between 1980 and 2005. A simple correlation between government spending patterns and project ratings is displayed in figure A.

Countries with higher ratings on the International Country Risk Guide have lower measured corruption and lower to moderate corruption risk ratings (figure B). These countries allocate more resources to public goods than countries in the high-risk category. In general, institutional quality and public spending on social and nonsocial public goods are highly correlated. Stronger institutions could emphasize spending on public goods and increase the efficiency of government spending through transparent and accountable actions.

Project Success Is Closely Linked to Fiscal Policies and Institutions

Econometric analysis of project success rates (satisfactory overall outcome ratings as determined by IEG, using data from more than 2,477 projects in 86 countries evaluated between 1980 and 2005 and conditional logit analysis) found—

- The share of spending on public social goods is positively and significantly related to World Bank project success. Here, project success is the dependent variable and the share of spending on public social good is one of many explanatory variables. The magnitude of the effect (elasticity) is small but statistically significant.
- Institutions matter. For the 1994–2005 subsample, all else being equal, countries with stronger institutions have higher numbers of projects evaluated as satisfactory. This is consistent with previous studies. Dollar and Kraay (2004) found that after controlling for the initial level of GDP, the level of aid, and a country’s geographical location, the effect of institutions was strong and positive. Better institutions produce more successful projects.
- The growth rate of GDP per capita is significantly associated with satisfactory project ratings.^a



Source: IEG and International Country Risk Guide data, 1980–2005.
 Note: A lower ICRG index implies a higher risk of corruption and vice versa.

Source: Flanagan (Forthcoming).

a. Results are to be interpreted with caution. Good ratings on individual projects alone do not always translate to good results at the sector or country level. For example, individual project success in increasing school enrollments may not mean better educational outcomes if they are not targeted and supported by sectorwide actions.

Fiscal Policy Has Improved the Quality of Growth in Some Ways in Some Countries . . .

Several country studies illustrate the role of fiscal policies in changing the pattern of growth. Table 3.1 presents the shares of expenditure on public goods (type A) versus expenditures for private goods and subsidies (type B) in four countries. The share of type A expenditures has been high and rising in Chile and the share of type B has been declining. The ratios of type A to type B expenditures are rising in Chile and China for different reasons. In Chile there is a rapid shift to type A expenditure, but in China the trend is associated with a reduction in type B expenditures over time as subsidies to state-owned enterprises declined during economic transition. These ratios have remained nearly constant over time in Brazil and India. Comparisons are illustrative rather than definitive, given the weakness in the data, especially concerning type B expenditures.

In Chile, the government rationalized the expenditure side very well, with the share of

spending on public goods rising to more than 71 percent in the early 2000s, one of the highest in the countries studied, starting from 55 percent in the early 1980s. Chile shows that a drastic reallocation of government spending can be done in a relatively short time span, despite heavy lobbying to protect subsidies (see table 3.1 and figure 3.1). This reallocation could be one of the reasons for Chile's rapid growth over the last 15 years (López and Miller 2007a).

In China, the government mobilized public resources for massive investments—large dams, power generation systems, and national and regional highways. But it has been less successful in providing basic social services to rural and poor regions. The country's public spending on physical infrastructure has been among the highest in the world, which is good for growth. But the share of spending on education and health has been among the lowest. China is now reforming its transfers and subsidies (including cutting value added tax refunds to resource-intensive exports) to promote more balanced growth (Hofman and Kuijs 2007). Subsidies to

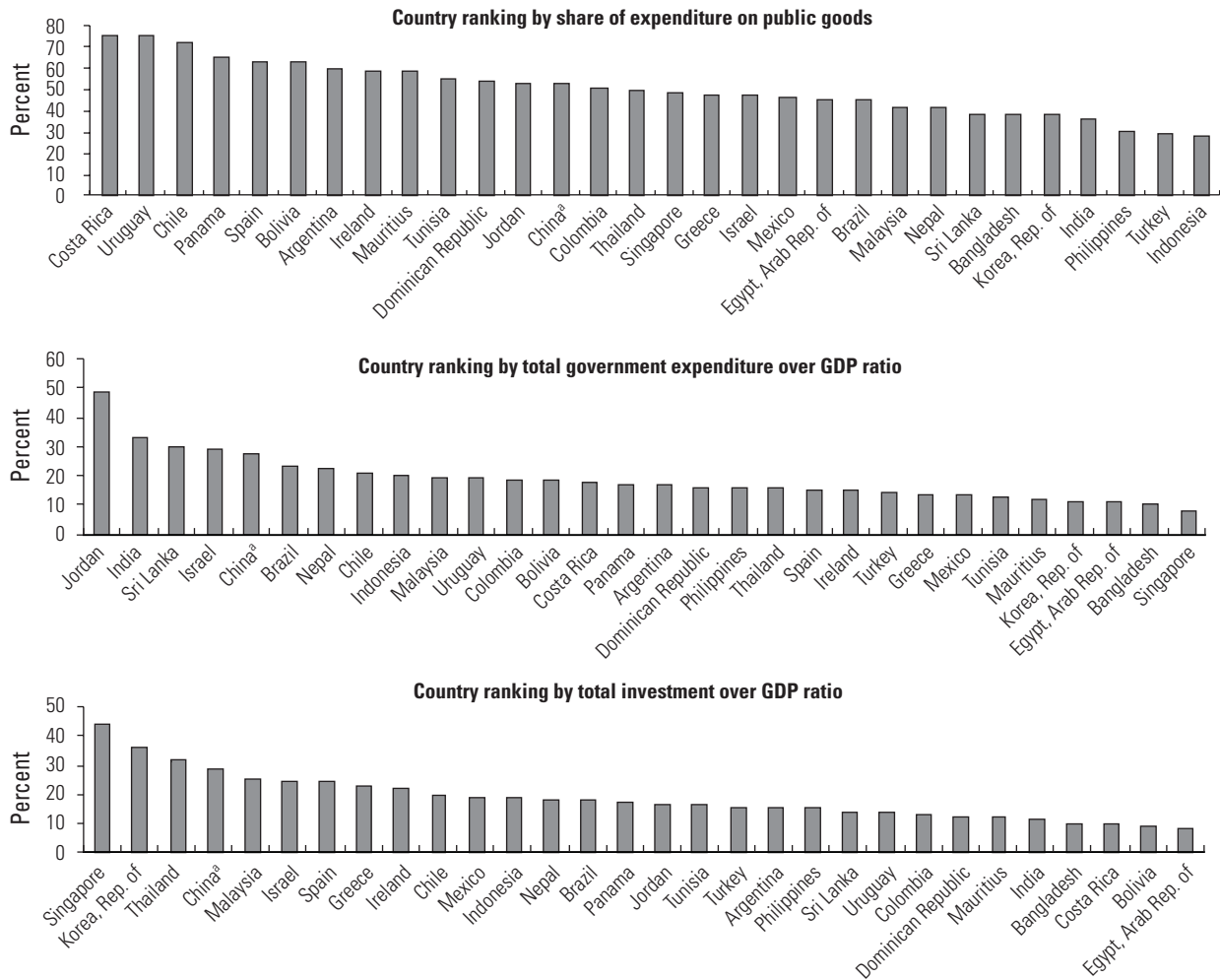
Table 3.1: Spending on Public vs. Private Goods: Trends in Four Countries, 1985–2005

Brazil: Federal and state government expenditure	1985	1990	1995	2000	2004	2005	Average^a
Share of public goods expenditures in total government expenditures (%)	42	30	47	35	37	38	41
Share of private goods and subsidy in total government expenditures (%)	24	47	36	27	32	32	34
Ratio of type A to type B expenditures	1.80	0.64	1.31	1.30	1.16	1.18	1.27
Chile: Central government expenditure	1985	1990	1995	2000	2004	2005	Average
Share of public goods expenditures in total government expenditures (%)	n.a.	70	78	80	82	83	77
Share of private goods expenditures in total government expenditures (%)	n.a.	30	22	20	18	17	23
Ratio of type A to type B	n.a.	2.32	3.55	4.03	4.70	4.83	3.58
China: General government expenditure	1985	1990	1995	2000	2004	2005	Average
Share of public goods expenditures in total government expenditures (%)	64	60	45	50	48	48	51
Share of private goods and subsidies in total government expenditures (%)	34	26	17	15	14	14	21
Ratio of type A to type B	1.88	2.30	2.68	3.29	3.37	3.45	2.53
India: Consolidated general government	1985	1990	1995	2000	2004	2005	Average
Share of public goods expenditures/Total exp and net lending (%)	32	31	29	29	29	32	30
Share of private goods expenditures/Total exp and net lending (%)	18	18	18	18	19	18	18
Ratio of type A to type B	1.77	1.71	1.63	1.62	1.49	1.82	1.63

Note: This table is illustrative because these ratios of type A to type B are calculated based on data from individual country studies from government sources. They are only comparable over time for each country, not across countries, because definitions of private goods and subsidies (type B) may differ.

a. Average is the simple average calculated over all years 1985–2005; only certain of those years are presented here.

Figure 3.1: Ranking of Various Types of Expenditure: Public Goods vs. Total



Source: López and Miller (2007a).

a. China is added here based on Hofman and Kuijs (2007). Data cover 1980 through 2004.

the state-owned enterprises have been gradually reduced, and preferential tax treatment to foreign investors was reformed and eliminated in 2008 (Wang 2007). A program of “returning cropland to forest” or payment to ecological services has started to show positive results in both reforestation and reducing rural poverty by encouraging rural-urban migration.

Brazil’s achievements in reducing poverty and inequality can be partly attributed to higher social spending and possibly to better tax collection. The incidence of poverty fell from 38 percent to 34.5 percent between 1995 and 2004.

Inequality, as indicated by the Gini coefficient, fell from about 0.59 in the late 1990s to 0.56 in 2005 (see figure 1.4). There was an increase in the share of spending on public goods, from 32 percent in 2000 to 38 percent in 2005, but the share of type B spending has also increased (table 3.1). Recent studies suggest that social assistance can explain, at most, 50 percent of the reduction in inequality. A significant part of the remaining unexplained reduction in inequality could be from higher tax revenue. Increased government enforcement of tax collection, reduction of tax evasion, and lower income tax exemptions are likely reducing inequality.

Various studies show that income taxes are progressive in Brazil, so increasing taxes is likely to improve the income distribution. There has also been a parallel “prodistribution” development: a gradual but steady decrease in income tax exemptions, from 0.56 percent of GDP in 1998 to 0.44 percent of GDP in 2005. Even if not large, this change has a positive effect on the distribution of income. Continuing to rely on indirect taxes has proven to be regressive (Romano and Sakurai 2007).

In Africa fiscal resources have increased since the Heavily Indebted Poor Countries Initiative in the mid-1990s, and public spending on education, health, and water and sanitation rose significantly, which improved human development indicators. Many challenges remain, however. Government revenue as a share of GDP has remained flat for decades in each of the countries, at about 10–14 percent of GDP, despite several attempts to strengthen tax administrations. Revenue collection in other low-income countries is around 20 percent of GDP, and in developed countries it is 30–40 percent of GDP. Low revenue collection constrains the governments’ developmental role in improving the quality of life (Nallari 2007).

... But Not in Other Respects

Chile’s tax policies have not been on par with its expenditure policies. Tax loopholes have benefited mainly the rich. They amount to foregone revenues on the order of 5 percent of GDP, with about 81 percent of the benefits going to the wealthiest 5 percent of the population, and 61 percent of benefits going to the richest 1% percent (SII 2006). Chile has not taxed the large resource rents, appropriated by a few domestic and foreign corporations, thus reducing the potential pro-poor effects of growth. The tax loopholes and the reluctance to tax the rents of natural resources significantly contribute to a narrowing of the tax base. These may be reasons why the country has not been able to extract an even higher growth dividend from its exemplary spending policy.

China’s fiscal system is still in the transition process, moving from the planning model of financing industrialization to the market model of providing public goods and services. Its fiscal stance has improved since the tax reform of 1994, with the fiscal envelope reaching nearly 25 percent of GDP, including extra-budgetary funds. Fiscal disparities among subnational governments are large. The richest province has more than eight times the per capita spending of the poorest provinces and the richest county has about 48 times more per capita spending than the poorest.

But China’s fiscal policy does little to redistribute income. The current transfer system is dominated by tax rebates and numerous earmarked grants, which together make up more than 60 percent of total grants. The general equalization grant makes up only 10 percent of transfers to the regions, leaving a mismatch between local government responsibilities and resources. Governments in poor regions therefore offer fewer (and lower-quality) public services than their counterparts in rich regions. Income taxes are rising but account for a small share in total government revenue, whereas indirect taxes accounted for 72 percent of total tax revenue in 2005 (Dollar and Hofman 2007).

India’s fiscal policy has not been very effective in reducing poverty or in managing the environment. Since the 1970s, India has run fairly large fiscal deficits (an average of 8 percent of GDP), building up a huge domestic public debt and large interest payment obligations. In 2004, the debt-to-GDP ratio reached almost 90 percent, and interest payments climbed to more than 7 percent of GDP, substantially exceeding total public investment. The large fiscal deficits have not helped growth. And large interest payments and wage increases have constrained India’s ability to invest in infrastructure and human development.

Each year India spends about 5 percent of GDP on subsidies, including for food, fertilizer, petroleum products, and electricity. Many of the

subsidies are aimed at helping the poor, but evidence suggests that the actual benefits are likely to have accrued more to the rich. For example, the electricity subsidy adds a huge financial burden to state government budgets, reduces investment, and leads to inefficient power use. Incidence analysis shows the targeting of this massive subsidy to be poor. Incidence analysis of health and education spending also suggests that there is scope for substantially improving equity (Ahmed 2007).

In Ghana, public spending on infrastructure construction has increased since the early 1990s, facilitating trade, growth, and informal sector development. Access to electricity rose from 30 percent in 1991 to 50 percent by 2006, but only 10 percent of the electricity subsidies reached the poor. About 20 percent of the poor now have access to electricity, far less than the 56 percent for the non-poor. Poverty-related public spending has been high, at about 6 percent of GDP since 1992, but the pattern of public spending is heavily oriented toward the wage bill. Government employment is large, and wage awards to the public sector are frequent and large, especially around the time of national elections. This pattern of government spending did not benefit the poor as much as it could have (Nallari 2007).

Note

1. The data used in background paper 1 cover only the central government expenditures and exclude local governments. In most countries, the central government spends a high portion of public expenditures. Moreover, in the few cases where we have data for central and local government expenditures, there is a high correlation between the public goods/private goods ratios or shares between local government expenditures and the central government expenditures (for example, in Brazil this correlation coefficient is about 0.82). Since the econometric findings use five-year averages as basic data points, there is the question of the short time span in observing effects. While some of the investments in public goods are likely to have maturity periods of longer than 5 years (for example, formal education), others, such as expenditures in skill training, certain health improvements, and agriculture technical extension, are likely to yield dividends much more quickly. More important, a reallocation of expenditures involves reducing expenditures in private goods, which is likely to have negative productivity effects by inducing market distortions. Removing such expenditures is thus likely to have more rapid effects well within the five-year period. Finally, at least some of the econometric results rely as much on cross-country variance as within country variability, the former of which is likely to contain long-term information.

CHAPTER 4

Fiscal Policy, Poverty, and Structural Inequality

The efficiency of translating economic growth into poverty reduction depends on the initial level of income, the initial degree of income inequality, and whether growth is accompanied by changes in inequality.¹ There is a vast literature on the growth-poverty-inequality nexus. It is conclusive on the first question of growth-poverty association. The empirical literature suggests that economic growth may affect inequality, but there is a significant variance when it comes to the relationship between public expenditure and inequality.

The literature addresses three themes: (i) the relationships among measures of social capital, government actions, and inequality; (ii) the median voter hypothesis and its implications for fiscal policy; and (iii) the effects on inequality of public spending (specifically education and health).² Only a few studies have examined the impact of fiscal policy on poverty and inequality directly, because of poor data quality (Wikstrom 1999; Piketty and Saez 2006, 2003; Saez and Veall 2005).

Growth, Poverty, and Inequality

Our cross-country assessment makes clear the effect of fiscal policy and GDP growth on inequality and poverty (López and Torero 2007). It uses a sample of 40 developing countries; each country had at least two national household surveys during 1980–2005. The household income-distribution data from these surveys were combined with national accounts data and other political and institutional data. The empirical method departs from the above studies in three ways. First, it measures the impact of public expenditures on the different parts of the distribution directly. Second, it looks at the composition of public expenditures, not just its aggregate level. Third, it studies the effects of public

expenditures on the income growth rate (instead of income levels) of the various income groups.

This work confirms that GDP growth is good for the poor in middle-income and low-income countries. This is consistent with previous studies by Dollar and Kraay (2002), Ravallion and Chen (2004), and others. Our study did not find evidence of a growth and inequality tradeoff. It shows that GDP growth improves the distribution of income quite significantly in middle-income countries but not significantly in low-income countries. This is consistent with Ravallion's work showing no evidence of tradeoff between growth and inequality.³ In Chinese provinces with rapid growth and poverty reduction, inequality did not worsen. So growth can be good for the poor and perhaps also for social equity, especially in the subsample of middle-income countries.

Spending on Public Goods Associated with Reduction in Poverty

Our analysis also shows that reallocating government spending from private goods and nonsocial subsidies to public and semipublic goods—though it keeps the total government expenditures constant—is associated with

reductions in poverty. Government expenditures in social goods have a positive association with average household income and with the different groupings of household income, even though their distribution effect is neutral. The quantitative value of the effects of social expenditures on the household incomes in the poor countries is, however, rather modest. This implies that a reallocation of government spending to social public good is associated with reducing poverty, but not income inequality.

Public social spending is distribution neutral in our sample of low-income countries during 1980–2004, implying poor targeting. Despite many successes, such as the conditional cash transfer programs in Brazil, Mexico, and other countries, some pro-poor programs have not reached the intended beneficiaries. The fact that social spending is distribution neutral, however, often implies that the poor are at least sharing part of the benefits of social programs. But inefficiency of spending often stands in the way: in Uganda in the early 1990s, for example, only 13 percent of the public education grants were reaching the end users or schools. Information provided to the public in local newspapers about the transfer of public funds for primary schooling and expenditure-tracking exercises enabled Uganda to significantly reduce district-level capture of public funds by local elites (Nallari 2007).

An India country study also corroborates these empirical results. State government spending on social public goods, including education and health, has a significantly positive association with poverty reduction and state GDP per capita, whereas inflation has a negative association. Reallocating spending to increase the share of social public goods could be associated with a significant reduction in the poverty headcount index during the sample period (Ahmed 2007). These results are consistent with the findings from our cross-country reviews.

Spending on nonsocial subsidies tends to be well targeted and favors the wealthy, mainly because they have resources to finance rent-

seeking investments. With careful targeting, however, the poor can benefit from spending on social goods. Direct transfers to households increase economic efficiency by allowing credit-constrained households to implement profitable investments. It is often politically difficult to reform subsidies that benefit the well-off, but adding new social subsidies to the poor is not difficult. The experiences of Mexico and Chile show that a shift in public expenditure patterns toward public goods can be done relatively quickly. Indonesia also reformed its fuel subsidies significantly in September 2005, with limited success; continued reform is needed (see box 4.1). Significant efforts must be devoted to the political economy of reforms: there is a need to balance the interests of the poor and the relatively well-off and to design a reform package (see Allcott, Lederman, and López 2006).

Taxation Nonprogressive and Unable to Address Inequality

Our cross-country analysis suggests that as currently implemented, taxes are nonprogressive within the household sector. These results are consistent with recent studies, such as López and Serven (2007), in that not much can be expected in terms of redistribution via taxation. The main reasons behind our results seem to be associated with the heavy reliance on indirect taxes and loopholes benefiting the wealthy and rampant tax evasion, which also mainly benefit the rich. These underlying factors are better explained by the country studies, and other recent evidence presented in studies by the Brookings Institution, Inter-American Development Bank, International Monetary Fund (IMF), and the World Bank.

Indirect taxes. There is greater reliance on indirect taxes than on resource rents, income taxes, or property taxes. Table 4.1 presents the share of indirect taxes in total tax revenue for four countries. This table is only illustrative, because it is based on data from country case studies for which the definitions may vary. Some economists consider indirect taxes to be regres-

Box 4.1: Public Expenditure Reviews: Mexico (2004) and Indonesia (2007)

The Bank conducts Public Expenditure Reviews regularly. While earlier such reviews focused more on the macroeconomic impact of fiscal policies, recent ones have moved to analyze the “pro-poorness” of public expenditures, linking composition of public expenditure with growth, poverty, and income distribution. The incidence of taxes (direct and indirect taxes) and of tax loopholes and exemptions, however, has not been widely analyzed. Two important Public Expenditure Reviews have provided supporting evidence that the composition of spending matters.

Mexico: This report finds that Mexico’s public finance system is redistributive in its impact. Most resources are raised from taxation of richer households and states. And, on average, public spending provides comparable benefits per capita to households and states at various income levels. One-third of central government spending goes for untargeted social programs with substantial participation by the poor, and almost 3 percent of central government spending goes for the poverty-targeted programs such as *Oportunidades* and *Procampo*.

The report points to “powerful vested interests [that] have captured important parts of spending, which then become rigid expenditures that are difficult to reallocate to the government’s programmatic priorities.” Public investment has been low until recently, and the quality of services delivered is largely unknown, and perhaps inadequate and inequitable in important areas such as education. Mexico’s experience of the last decade is positive, however, showing that it is possible to reallocate resources away from inefficient but entrenched programs like general food and agricultural subsidies, toward more effective and pro-poor initiatives, such as *Progresal/Oportunidades* and *Procampo*, when they are

well conceived and publicly presented (World Bank 2003b; Webb 2004a).

Indonesia: This Public Expenditure Review finds that macroeconomic policies with fiscal prudence have created a favorable environment for development results: Indonesia now has sufficient fiscal space and financial resources to address its development needs. Thanks to fiscal decentralization in 2001, one-third of central government expenditure was transferred to the regions. Provincial and district governments now manage 37 percent of total public expenditures and carry out more than 50 percent of public expenditure. Spending on subsidies and administration, however, accounts for one-third of total expenditures. Subsidies in 2006 still consume roughly 15 percent of the total budget and remain at the 2004 level. Spending on public investment has recovered to the pre-crisis level of 7 percent, and spending on education has risen. However, health spending and public infrastructure investment have been low.

The report points out that fuel and electricity subsidies are still a significant portion of the budget and largely benefit the better-off citizens. Although the 2005 adjustment to domestic fuel prices freed \$10 billion, in 2006 Indonesia still spent \$12 billion on subsidies, particularly on fuel and electricity—both are regressive. Reducing and reallocating inefficient and pro-rich subsidies would free additional fiscal resources of up to \$12 billion. In particular, electricity subsidies account for 28 percent of all subsidy costs, and largely benefit better-off Indonesians. Therefore, reducing subsidies for all electricity voltages above 450-volt amperes should be pro-poor, because the higher voltage levels are used disproportionately by those who are better off (World Bank 2007a).

Source: World Bank (2003b, 2007a).

Note: The 2005 Fuel Price Adjustment, which doubled the gasoline price and tripled the kerosene price, was considered “one of the most significant policy reforms of any developing country in 2005.” Subsequent studies have summarized the experiences and implications for other countries (Granado and others 2008).

sive, whereas others consider them to be less distortionary than labor and income taxes. The 2006 World Development Report pointed out the need to “keep indirect taxes from being regressive. With a few key exemptions, the [value added tax (VAT)] can be made less regressive. Bird and Miller (1989) show that in Jamaica, exempting five specific items from VAT halves the burden on the poorest 40 percent of population.” An IMF staff paper found that “replacing sales taxes with a comprehensive VAT typically

makes indirect taxes less progressive,” implying that lower-income households are likely to be net losers from revenue-neutral reforms. Studies also show that the progressiveness of the VAT can be improved by zero-rating certain categories, such as basic foods (see Coady 2006 for a review). A balanced approach between direct and indirect taxes (implying a 50:50 ratio) may be a feasible option to consider, pending further investigation, as the public finance literature does not provide a conclusive answer.

Table 4.1: Indirect Taxes as a Percentage of Total Tax Revenue

Country	2004–05
Brazil	51.4
Chile	68.0
China ^a	72.0 ^a
India	51.2
OECD average	32.0

Note: This table is only illustrative, because data are based on country studies. OECD = Organisation for Economic Co-operation and Development.

a. China's tax system is still in transition. There are five types of indirect taxes in China: VAT (tax rate at 17 percent; but basic necessities and agricultural products and utility are taxed at 13 percent; and exports of goods at zero rate) accounts for 36 percent of total tax revenue; a consumption tax (14 categories of goods) accounts for 5 percent of tax revenue, and a business tax accounts for 14 percent of tax revenue, in addition to a tax on imports (14 percent) and tariffs (3 percent), and others.

Some evidence from Brazil shows that although its direct taxes are progressive, indirect taxes are regressive. Adding them together, the total tax burden for households would be regressive: In 2004, families earning up to two times the minimum wage had a total tax burden of 49 percent of their family income, but the richer households had a total tax burden of 26 percent. In Chile, a resource-rich country, failing to tax resource rents distorts incentives in favor of the resource industries, thus exacerbating the dependence on natural resources for income generation.

Tax loopholes. There are legal tax loopholes that mainly benefit the rich segment of the population. In Chile, according to a recent report by the internal tax office, the loopholes account for almost 5 percent of GDP, with 61 percent of them benefiting the richest 1 percent of the population. The distributional impact of tax loopholes has not been carefully investigated. Also, because of the mainly discretionary nature of these loopholes, there is a presumption that they cause economic inefficiency, but few studies show the extent of this effect. Reducing taxes on profits may, under certain conditions, be advisable as a measure to promote investments, but doing so by allowing for special tax loopholes instead of across-the-board reductions in the profit tax rate is not likely to cause such an effect. A recent study of the US tax system links tax

loopholes with rising inequality (Furman, Summers, and Bordoff 2007).

Tax evasion. With evasion rampant, governments have to increase the tax rates on those who do not evade them. Because the main tax evaders are typically the economically powerful and not the middle-income and poor classes, tax evasion tends to be socially regressive and a significant contributor to structural inequality. Therefore, tax reform dealing with loopholes and evasions can increase the efficiency of the tax system, allow for lower tax rates, and avoid its negative social equity consequences. Careful analyses of the incidence of direct and indirect taxes and incidence of tax loopholes in major developing countries are needed (box 4.2).

Notes

1. This has been shown in the literature; see for example, Lopez and Serven (2006); Deininger and Squire (1998); Ravallion (1998, 2004); World Bank (2006d).
2. On the second line of research looking into the link between inequality and the median voter's desired pattern of policies, see Deininger and Squire (1998); Persson and Tabellini (1994); Bertola (1993); Arjona, Ladaique, and Peason (2003); Turnbull and Djoundourian (2005); Milanovic (2000); Bassett, Burkett, and Putterman (1999); Alessina and La Ferrara (2001); Kristov, Linder, and McClelland (1992); and for recent literature on this topic, Moene and Wallerstein (2001); and Kenworthy and Pontusson (2002). On the third branch of the literature focusing on inequality and growth, since they are both affected by redistributive public spending, particularly health and education spending, see Ross and Wu (1995); Perroti (1992, 1996); Bassett, Burkett, and Putterman (1999); Persson and Tabellini (1994); Alesina and Rodrik (1994); Osberg (1995); Sala-i-Martin (1997a, 1997b); Benabou (1996, 2000); Castello and Domenech (2002); and, most recently, van der Ploeg (2003); Gylafson and Zoega (2003); and Deaton (2003). Most of these studies conclude that there is no direct link between inequality and public spending in health and education.
3. Using data from 70 developing countries in the 1990s, Ravallion (2005) found no evidence of a tradeoff between absolute poverty incidence and relative inequality. The main reason is that

Box 4.2: Six Principles of Tax Reform

A strategy paper of the Brookings Institution points out—

Taxes contribute, as part of the problem or as part of the solution, to many of the challenges our nation faces. The present tax treatment of health insurance, for example, pushes health spending upward while offering many of the uninsured little help in getting coverage. The tax treatment of retirement savings provides a windfall for high-income Americans who would likely have saved anyway, while offering scant encouragement to saving by low- and moderate-income Americans. America's factories and cars continue to emit vast amounts of the carbon dioxide that drives climate change, a problem that would be remedied, in part, if the tax code imposed a cost for burning carbon-emitting fossil fuels (Furman, Summers, and Bordoff 2007, p. 3).

The authors present six principles of tax reforms:

- 1) Fiscal responsibility requires addressing both taxes and spending.
- 2) Rising inequality strengthens the case for progressivity.
- 3) The tax system should collect the taxes that are owed.
- 4) The tax system should strengthen taxation at the business level.
- 5) Taxes for individuals should be simplified.
- 6) Social policy can and should often be advanced through the tax code, and it must be well designed.

Tax policy can affect outcomes not just by subsidizing desirable activities but also by penalizing undesirable ones. In this manner, so-called Pigouvian taxes can lead business and consumers to take the social costs of their actions into account, helping to ensure that the outcome of market competition is efficient. Today, for example, gasoline taxes fall short of neutralizing the external harm associated with gasoline consumption, which includes not only climate change but also congestion, traffic accidents, and increased economic vulnerability to supply disruptions. Meanwhile the production of electricity and other energy from coal and natural gas is not taxed at all, despite its large contribution to climate change (p. 26).

On the political economy of reforms, a forthcoming Hamilton Project discussion paper will show “how carbon taxes to address these issues could be combined with other tax cuts to keep the outcome revenue neutral and distributionally neutral, thus protecting low and moderate-income families who would otherwise have a hard time paying the higher bills” (p. 26).

Source: Furman, Summers, and Bordoff (2007).

economic growth shows little correlation with changes in relative inequality. But there is evidence of a tradeoff for absolute inequality, suggesting

that those who want to lower the absolute gap between the rich and poor must be willing to see lower absolute levels of living for poor people.

CHAPTER 5

Fiscal Policy and the Environment

The environment influences people's health through exposure to physical, chemical, and biological risk factors and through related changes in behavior in response to these factors. A World Health Organization (WHO) study indicates that environmental risk factors, such as contaminated water and indoor and outdoor air pollution, play a role in more than 80 percent of the diseases it regularly reports. Globally, 25 percent of all deaths in developing regions were attributable to environmental causes but only 17 percent in developed regions (WHO 2006) (see box 5.1).

Studies relating fiscal policy to the environmental performance are scarce, but the number is rising (see, for example, IMF 2008; IEG 2008). Data are not easily available and, if available, are of poor quality. Governments in Organisation for Economic Co-operation and Development countries spend between 0.6 and 1.8 percent of

GDP and between 2 and 5 percent of government spending on environmental protection. However, the cost of emission and the impact on global warming is much higher. Data for developing countries are more scarce and uncertain, but spending on environmental protection is generally considered to be less than 1 percent of

Box 5.1: Impact of the Environment on Public Health

WHO's analysis looked at the total burden of diseases attributable to some of the most important environmental hazards and at other quantitative surveys of health impacts from the environment. Overall, an estimated 24 percent of the disease burden (healthy life-years lost) worldwide and an estimated 23 percent of all deaths (premature mortality) were attributable to environmental factors. Among children 0–14 years of age, the proportion of deaths attributed to the environment was as high as 36 percent. There were large regional differences in the environmental contribution to various disease conditions—due to differences in environmental exposures and access to health care across the regions. Diseases with the largest absolute burden attributable to modifiable environmental factors include diarrhea, lower respiratory infections, “other” unintentional injuries, and malaria.

Source: WHO (2006).

Developing regions carry a disproportionately heavy burden of communicable diseases and injuries. The largest overall difference between WHO regions was in infectious diseases. The total number of healthy life-years lost per capita as a result of environmental factors was 15 times higher in developing than in developed countries. The environmental burden per capita of diarrhea diseases and lower respiratory infections was 120–150 times greater in certain WHO developing country subregions than in developed country subregions.

Children bear the highest death toll, with more than 4 million environmentally caused deaths per year, mostly in developing countries. The infant death rate from environmental causes is 12 times higher in developing than in developed countries; the environmental fraction of diarrhea, malaria, and respiratory infections accounted for an average of 26 percent of all deaths in children under five years old.

GDP and less than 2.5 percent of total public spending.

Government spending on the environment is generally less than other expenditures (such as energy subsidies), which can provide perverse incentives to deplete resources and harm the

environment. And the orientation of broad fiscal policy—including the level and composition of most government spending (not purposely directed to the environment)—may have a great impact on the environment. (See box 5.2 about fuel subsidies, based on an IMF study.)

Box 5.2: Fuel Subsidies Benefiting the Rich and Hurting the Environment

Petroleum is, by far, the largest commodity in international trade, and its price is volatile. The past decade has witnessed both a decline to about \$10 per barrel and spikes going up to more than \$100 per barrel. High and volatile oil prices threaten the economies of oil-exporting and oil-importing developing countries and pose challenges to poverty, inequality, social stability, and sustainability.

A recent IMF study found that more countries are providing fuel subsidies and the amounts are higher. "Less than half of the 42 countries reviewed have fully passed through the surge in international fuel prices to retail prices of domestic fuels in 2007. This is lower than what was observed in 2006, when three quarters of the countries allowed domestic retail prices to rise. Low pass-through is now reflected in higher fuel subsidies and foregone petroleum revenues."

Table A: Fuel Subsidies (in percent of GDP)

	Act. 2003	Act. 2005	Prel. Act. 2006	Proj. 2007
a. Explicit subsidies				
Cameroon	0.00	0.24	0.23	0.25
Congo, Republic of	0.80	1.00	1.00	2.00
Ghana	0.24	0.42	1.52	0.03
Nigeria	0.02	0.19
Senegal	...	0.62	0.57	0.47
India ^a	...	0.70	1.20	1.40
Indonesia	1.47	3.40	1.90	2.10
Azerbaijan	5.10	2.78	1.89	...
Jordan	0.00	5.60	2.79	2.50
Lebanon	...	0.09	0.10	0.10
Mexico	0.50	0.50
Yemen, Republic of	4.80	8.70	8.10	9.30
Bolivia	0.62	0.82	1.25	1.38
Dominican Republic	...	0.54	0.54	0.48
Honduras	...	0.42	0.29	0.29
b. Implicit subsidies				
Gabon	0.39	1.54	2.07	1.00
Bangladesh	...	0.90	1.03	1.00
Azerbaijan	10.00	13.90	14.33	13.38
Egypt, Arab Republic of	3.86	4.12	6.80	5.50
Peru	0.00	0.07	-0.01	0.14

Source: IMF staff.

a. These are estimates of total subsidies, as details of how much of the amount are explicit or implicit are not available.

Amount of Subsidies

Several countries have responded to the rising oil prices by increasing price subsidies on domestic fuels. Explicit subsidies mainly reflect compensation to the national energy company for the increased difference between the wholesale domestic price and the world price of fuels. Data on countries providing such subsidies in 2007 are available for only 14 countries and range from 0.1 percent of GDP in Lebanon to 9.3 percent of GDP in the Republic of Yemen, with an average of 1.5 percent of GDP. Not surprisingly, explicit subsidies were larger in countries where the price pass-through was smaller. Examples include the following.

- **Jordan.** Since 2003, Jordan is importing oil at world prices, and oil subsidies have now reached 2.5 percent of GDP. However, the country planned large petroleum price adjustments in early 2008.
- **Yemen.** Subsidies reached 9.3 percent of GDP in 2007 (compared with 4.8 percent of GDP in 2003). A reduction in fuel subsidies is a part

Box 5.2: Fuel Subsidies Benefiting the Rich and Hurting the Environment (continued)

of the government's strategy, but price increases were scaled back in 2005 following violent public protests.

- **Indonesia.** Subsidies increased from 1.5 percent of GDP in 2003 to 2.1 percent of GDP in 2007, despite a doubling of domestic retail prices in 2005.
- **Mexico.** Excise taxes were reduced in 2006 to limit the increase in domestic fuel prices. Nevertheless, as oil prices continued to rise, the tax eventually changed into an explicit fuel subsidy, currently amounting to 0.5 percent of GDP.
- **Implicit subsidies reflect domestic sales of fuels at below export prices, with no explicit compensation in the budget.**

Data in 2007 were available for only five countries, and these subsidies ranged from 0.14 percent of GDP (Peru) to 13.4 percent (Azerbaijan). Implicit subsidies now average 4.2 percent of GDP.

Beneficiaries

Much of the fuel subsidies go to higher-income households. The top 20 percent of households received, on average, about 42 percent of the total subsidy, whereas the bottom 20 percent received less than 10 percent. Fuel subsidies are a costly approach to protecting the real incomes of poor households.

Source: Baig and others (2007).

One of the few studies that relate fiscal policy to the environment looks only at the effect of total government size on sulfur dioxide (SO₂) concentrations (Bernauer and Koubi 2006). It finds that a large government is detrimental to the environment. But on the key issue of how the orientation or composition of government spending affects the environment, there are no earlier studies.

Our study econometrically evaluates the effects of the size and composition of government expenditure on various components of air pollution using a new dataset that contains 31 developing and developed countries, with annual data for about 300 sites in 86 cities over 1985–2000 (López and Islam 2007). The analysis considers five major air pollutants: SO₂, nitrogen dioxide (NO₂), lead, carbon monoxide (CO), and air particles (PM₁₀).

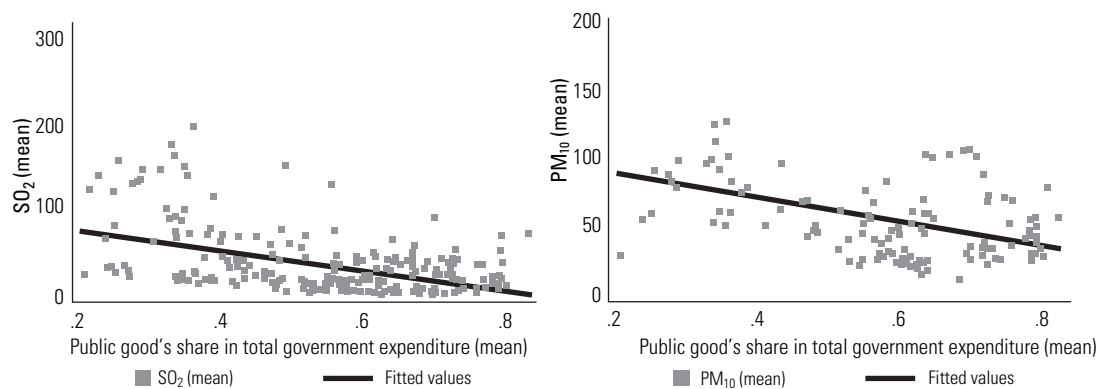
A major finding is that both total government consumption and the share of public goods in total government spending tend to be positively associated with air quality, as measured by the five pollutants. After controlling for per capita household income, the level of total GDP (normalized by the area of the country), the growth rate of GDP, and unobserved site-fixed effects, the two fiscal policy indicators are negatively associated with concentrations of air pollutants. The only apparent exceptions are the

effect of the share of public goods on PM₁₀ (positive and significant) and the effect on carbon monoxide (statistically insignificant).¹ That is, a larger government and a shift in the composition of government spending toward public goods appear to significantly improve the quality of the environment, as measured by some of the most important air pollutants, including SO₂, NO₂, and lead (see figure 5.1).

These findings are important because air quality is widely regarded as one of the most important indicators of environmental quality. The five pollutants (in conjunction with ozone) are often called “criteria pollutants.” They also have direct effects on human health, ecosystems, and the economy. And available technologies allow for effectively controlling them, often at a reasonable cost.

Results show that increasing the size of the government may increase the size of the service sector (social and public services), inducing a cleaner economy with generally less pollution. Similarly, increasing the share of public goods in total government expenditures may increase government provision of environmental protection and pollution regulation, two important public goods. And because a large part of the subsidies to private goods (energy and heavy industry) is environmentally perverse, a shift

Figure 5.1: Spending on Public Goods Associated with Reductions of Air Pollution (share of public goods in total government expenditure, SO₂, and PM₁₀, 1986–99)



Source: López and Islam (2007).

Note: Figures based on data from the new GEMS dataset.

from subsidies to public goods may reduce incentives to pollute. This may explain the large and statistically significant effect of the share of public goods in government spending.

It appears that most air and water pollutants tend to behave similarly across countries over time (Bernauer and Koubi 2006). So the foregoing evidence may be considered representative for the effect of fiscal policy on environmental pollution, in general. There are however, some exceptions, such as ozone (which appears to be a substitute with other air pollutants) and especially deforestation (López and Galinato 2007). The levels of deforestation seem at times to be at odds with the evolution of pollution. Some countries that have diminished air pollution have continued deforestation at fast rates.

This result is corroborated by the rural study from 15 Latin America and the Caribbean countries, which shows that an increase in the share of spending on rural public goods makes agricultural growth much less dependent on land expansion than on intensification (López and Galinato 2007). That is, governments that spend a greater share on public goods than on subsidies to private goods are likely to reduce pressure for land expansion for agriculture. Another finding is that the total level of government spending in rural areas has no effect on the pattern of growth of

agriculture; that is, total expenditures make agriculture neither more nor less extensive.

Agriculture and livestock expansion is a major source of deforestation in many countries, especially in tropical ones, where most of the remaining natural forests are located (López and Galinato 2007). This implies that the widespread use of rural government subsidies in these countries is likely to be a significant source of deforestation. The empirical estimates suggest that shifts in government spending from subsidies to public goods can be a powerful instrument to reduce pressure on forest areas. Where agriculture competes with forest for land, the heavy emphasis on subsidies is likely to aggravate pressure for agriculture expansion and deforestation.

Our study points to a major area of tradeoff that relates to the pace of growth and environment degradation. As shown in chapter 1 and other studies (including the country study on China; Hofman and Kuijs 2007), there seems to be a negative association between the pace of economic growth and the quality of the environment. Policy makers everywhere may face a tough choice: can we afford to lose growth to reduce greenhouse gas emissions and prevent further global warming? The results from our econometric analysis, however, show that the right fiscal policy—more spending on public goods—can help alleviate this tradeoff. With

technological progress and well-advised policies, including those proposed by the Stern report (market-based pricing and taxing policy, such as carbon trade and financing and a carbon tax), the sacrifices in growth and welfare may or may not be so large, or even necessary. Here, the role of international financial institutions is crucial in helping design the best tax and pricing policies widely acceptable by the rich and the poor, domestic and abroad.

Progress has been made in carbon trading and in encouraging ecofriendly behaviors through direct payment to households in exchange for ecoser-

vices. In the past decade, an increasing number of incentive-based conservation programs have been launched in the economies of developing countries, including Costa Rica, Columbia, Mexico, and China. Often called *payments for ecosystem service*, these incentive-based programs provide financial incentives to those who supply ecosystem services. These programs, if well designed and implemented, can benefit both the poor and relatively well-off (box 5.3)

Note

1. This is a concern because PM_{10} is, by far, the most harmful pollutant to health.

Box 5.3: Impact of the Grain-for-Green Program in China

Following a series of devastating floods in 1998, a program called Grain-for-Green, also known as “returning cropland to forest,” was initiated by the Chinese government in an effort to increase forest cover and prevent soil erosion on cultivated slopes. When a community is selected to be part of the program, households can choose to set aside all or part of the cultivated land on slopes and plant them with tree seedlings. Each participating farmer receives in-kind grain, cash, and free seedlings. In-kind grain and cash are given out annually after a farmer’s program plot passes an inspection; seedlings are provided only in the first year.

The level of compensation is not trivial, relative to the earnings of the typical participating household in the study region. For example, if an average household in Sichuan Province received full compensation, the amount was about 24 percent of average per capita income in 1999 (Uchida, Rozelle, and Xu 2007).

Potential Effects

The program directly affects household incomes through grain and cash compensation, which can be used for other productive activities and for consumption. It also can indirectly induce

structural change in household wealth by reducing the demand for labor for cultivating crops. How the freed-up labor time gets reallocated may critically depend on other physical resources of the household, the household’s stock of human capital and preferences for leisure, as well as the conditions of land, labor, and credit markets.

Initial Impact

Using a unique panel data set that covers both participating and nonparticipating households from three provinces in 2003 and 2005, Uchida, Rozelle, and Xu (2007) found that the Grain-for-Green program had a positive effect on off-farm labor participation. Households with fewer liquid assets prior to the beginning of the program were more likely to start an off-farm job.

The level of the household’s human capital also affects the off-farm labor participation, which indicates that there may be more impediments to participating in off-farm labor in developing countries. Therefore, complementary support to the poor and vulnerable, through job training and other means, is needed if the potential win-win outcomes from the Grain-for-Green program are to materialize.

Source: Uchida, Rozelle, and Xu (2007).

CHAPTER 6

What All This Might Mean for Countries and Donors

This review focuses on the composition of public expenditures and taxes, linking them to the implications of growth for poverty, distribution, and the environment. Although this work has a narrow scope and represents an initial attempt with many limitations, it does provide an integrated policy framework that countries might consider for improving the quantity and quality aspects of growth.

- *Restructuring government spending.* The main findings of this paper confirm that government spending on public goods is associated with higher and better growth. This finding is robust under multiple sensitivity tests and when using different data and methods, including cross-country, country-specific, and project analysis (box 3.2). Thus, government expenditures could be restructured to transform them into better instruments for reducing poverty, narrowing structural inequality, and promoting environmentally sustainable growth. This requires reallocating government spending away from subsidizing private goods—which provides perverse incentives for resource depletion—and toward providing more public goods, while keeping the total government expenditure constant. This implies reducing perverse subsidies and reallocating public expenditures at the margin. It does not mean that government could select a growth trajectory that is not consistent with its comparative advantages. On the contrary, the quality of growth would be higher if the comparative advantage of a country were allowed to develop to the fullest extent. Structural inequality would be narrowed by mitigating market imperfections and reducing the influence of lobbies.
- *Reforming tax systems.* Plugging loopholes, reducing tax evasion, and fairly taxing rents from natural resources can make the tax system more efficient and less dependent on indirect taxes. Once public spending becomes more consistent with the three objectives of growth, social equity, and the environment, the tax base should be broadened. New taxes and tradable quotas may be needed to establish the right prices for natural and environmental capital, generating more revenue while providing the right incentives for reducing greenhouse gas emissions. Adequate taxation of rents from natural resources could also be a priority. International coordination of a tax system is key, because capital flows easily across borders. International financial institutions can play a crucial role in the harmonization/standardization of tax codes.
- *Providing more public goods.* With an increased revenue base, countries could embark on a second round of expanding the provision of public goods while maintaining fiscal sustainability. Expansion could include investing more in enhancing institutions, including property rights, and reducing the impact of imperfect markets on efficiency and inequality. It could include increasing the efficiency of government expenditures, which in turn would allow for increasing the quality of education, health care, social protection, crime prevention, and infrastructure. And it could include resource management, pollution control and abatement, and the adaptation of low-emission technologies.

Additional work can support these directions:

- It would be valuable to conduct more analytical evaluations of government spending as part of the periodic reviews of *public expenditure*, particularly the split between spending on private subsidies and spending on public goods. Incidence analyses on beneficiaries of private subsidies and of tax exemptions would also be useful, because that is related to policy captures by higher-income groups.
- There needs to be an increased emphasis on the evaluation of tax systems, particularly in documenting tax evasion and efforts to reduce it. There is a need to assess progress in eliminating tax loopholes, especially the most regressive ones, and widen the tax base to ensure fiscal sustainability. Studies of the impact of indirect taxation on economic efficiency and equity are especially useful, because currently there is a gap in this area.
- Finally, there is also a need to assess whether countries attain a fair share of the rents from natural resources and what countries are doing to reduce environmental degradation and to enforce environmental regulations. It would be useful to provide more analysis of best practices on greener taxes and other fiscal policies for environmental sustainability.

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