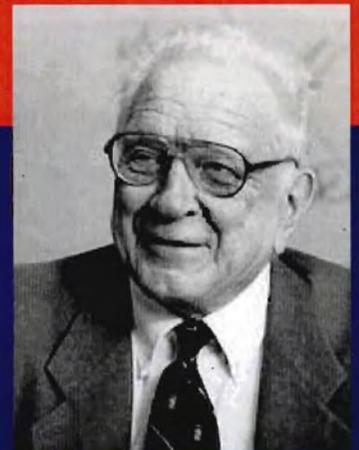




**USAID**  
FROM THE AMERICAN PEOPLE

# ARNOLD C. HARBERGER: COLLECTED ECONOMIC REPORTS



Prepared for USAID, 2005–2007



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# ON THE PROCESS OF GROWTH AND ECONOMIC POLICY IN DEVELOPING COUNTRIES



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# ON THE PROCESS OF GROWTH AND ECONOMIC POLICY IN DEVELOPING COUNTRIES

Arnold C. Harberger  
University of California, Los Angeles

Bureau for Policy and Program Coordination

The findings and conclusions in this report are those of the author and do not necessarily represent the views of USAID.

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# Preface

This paper is one outcome of a larger inquiry into the process of growth and economic policy undertaken in 2004–05 by USAID and Arnold Harberger. The effort included meetings and discussions over several months with representatives of multilateral institutions such as the IMF and World Bank, think tanks such as the Center for Global Development and the Center for Strategic and International Studies, and principals in USAID, including Administrator Andrew S. Natsios.

USAID and most other international donors view economic growth as an essential component of the process of raising living standards for poor people in developing countries. This paper focuses on understanding the process of economic growth, the sources of growth, how growth may be reliably measured, and the role of economic policies in facilitating or impeding growth.

In this paper, Harberger provides real-world examples to illustrate the basic concepts and processes that lead to economic growth: the facilitative character of appropriate economic policies, the importance of a competitive private sector in real cost reduction, the idea that growth results from an accumulation of “changes of level” rather than from a self-sustaining process, and the importance of applied welfare economics as an instrument of development policy.

This paper contains a wealth of information and insight that should be easily understood by the noneconomist. This paper should be required reading for all development professionals seeking a brief, informative explanation of the relationship of economic policies to economic growth, and how the process of growth works to combat poverty in developing countries.

Kenneth Beasley  
Economist and Senior Program Analyst



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# On the Process of Growth and Economic Policy in Developing Countries

## Introduction

The aim of this paper is to help readers understand the problems of fostering economic growth and combating poverty in developing countries. It provides insight into how the process of economic growth really works and explores how economic policy can operate to liberate

**This paper provides insight into how the process of economic growth really works and explores how economic policy can operate to liberate the forces of growth.**

the forces of growth. It also calls attention to the fact that increased productivity has historically been the most reliable path to poverty reduction, and hence merits a position of high priority in national and international efforts.

## The Recent Record of Unprecedented Success

Few people, even among the normally well informed, are aware of how outstanding the world's recent economic performance has been.

It is not an exaggeration to say that the half-century from 1950 to 2000 was the greatest in history in terms of improvements in the health, prosperity, and welfare of the world's population. Further, the quarter-century from 1975 to 2000 has no problem in claiming the championship as the best ever. The data to support these assertions are easy to find. The UNDP's *Human Development Report 2003* reports that life expectancy at birth (world average) rose from 58.4 years in 1970–75 to 66.6 years in the first years of this century. These improvements were almost precisely matched in developing countries, where life expectancy moved from 55.8 to 65.1 years. The least developed countries were not left behind—their average rose from 43.7 to 51.4 years. Simultaneously, infant mortality fell worldwide from 96 per 1,000 live births to 56 per 1,000, and in developing countries from 109 to 61 per 1,000. In the least developed countries it dropped from 150 to 99 per 1,000 live births.

We present these figures at the outset to reinforce the story told by the more strictly economic data, which show

that world GDP almost doubled in real terms during the last quarter-century. This feat was amply surpassed in developing nations, whose real GDP grew over the same period to more than 2.5 times its initial level.<sup>1</sup> Table 1 makes clear that poverty need not breed despair: growth in low-income countries surpassed that of middle- and high-income countries. The only areas that witnessed negative per capita growth were the countries of the former Soviet Bloc and in sub-Saharan Africa—the first suffering from the turmoil of transition, the second from massive internal conflicts, political disorganization, and the scourge of HIV/AIDS.

Growth between 1975 and 2001 in the world's 10 most populous countries is summarized in table 2. It makes clear that the very positive picture that emerges from the aggregate data also extends to this group of countries, which contain about 60 percent of the world's population. In six of these countries, GDP per capita growth exceeded the average world rate of 1.2 percent, and China and Indonesia had extremely impressive performances.<sup>2</sup>

Champions of growth in the period 1975–2001—countries that achieved annual per capita growth rates of 4 percent or more over this time span—are presented in table 3. Notably, five of these countries (Korea, Thailand, Indonesia, Chile, and Malaysia) achieved this rate in spite of having suffered a major

<sup>1</sup> Data are from UNDP, *Human Development Report 2003*. Life expectancy and infant mortality data are from pp. 26–55, GDP data are from pp. 278–81, and population data are from pp. 250–53.

<sup>2</sup> Recognizing that China has a heavy weight in the results for this group, I also present summary figures excluding that country.

**Table 1. World Economic Growth 1975–2001**

	Growth Rate (% per Year)		
	Population	GDP Per Capita	Total GDP*
World	1.6	1.2	2.8
Advanced countries (OECD)	0.7	2.1	2.8
Developing countries	1.9	2.3	4.2
Least developed countries	2.5	0.4	2.9
Arab states	2.7	0.3	3.0
East Asia/Pacific	1.4	5.9	7.3
Latin America/Caribbean	1.9	0.7	2.6
South Asia	2.1	2.4	4.5
Sub-Saharan Africa	2.8	−0.9	1.9
CIS/Central/East Europe**	0.5	−2.5	−2.0
High-income countries	0.7	2.1	2.8
Middle-income countries	1.5	1.6	3.1
Low-income countries	1.8	1.6	3.4

Sources: UNDP (2003); table 5 for annual population growth rate, 1975–2001; table 12 for annual growth rate of GDP per capita, 1975–2001.

\* = column 1 + column 2.

\*\*Commonwealth of Independent States.

crisis during the period. Korea experienced political upheaval in 1979, which, along with an oil crisis and crop failure, cut economic growth to −2.1 percent in 1980. Similarly, Indonesia's GDP fell by 13.1 percent in 1998 under the stress of a banking crisis and political turmoil, and Chile's dropped by 14.2 percent in 1982 under the combined weight of an international debt crisis, a failing internal banking system, and plummeting copper prices.

What do these countries have in common that may signal the likely source of their success? I believe they were all outstanding in the degree to which they undertook and accomplished significant structural adjustment and in the degree

to which their economic policies reflected the broad outlines of the “Washington Consensus” of macroeconomic stability, domestic liberalization, and, of course, international openness.

It is very difficult to find simple measures that summarize the merits and demerits of a country's economic policy. Each country has different types of comparative advantage, production patterns, resource endowments, geographic layouts, and historical experiences. But one point on which economists widely agree is that it is strongly in a country's interest to open its economy to the rest of the world and to make the most, via trade, of its own comparative advantage. A straightforward measure that is very

likely to reflect a country's efforts in this direction is the course of its exports.

Table 4 tracks the exports of the 10 "champions," showing that they nearly tripled their share of world exports over the 1975–2001 span.

Several of these countries began their success stories wrapped in a snarl of economic controls, regulations, and constraints: Korea and Indonesia in the 1960s, Chile in the early 1970s, and Vietnam and China into the late 1970s and even early 1980s. Singapore and Hong Kong were the only growth champions that had historically followed a liberalizing line. But all these growth leaders eventually developed into market-friendly countries with policies that consciously tried to clear the path for the forces of economic growth to work.

## Dissecting the Process of Economic Growth

It is absolutely crucial to recognize that all economic growth takes place at the level of the productive enterprise—otherwise it is impossible to have a clear understanding of the growth process. To elaborate, GDP is measured as the sum of the product produced in all counted economic activities of a country. Sometimes it is measured at the level of final goods and services, but it obviously incorporates all the value added (during earlier stages) that went into those final products. Even more often, in building national accounts, we count the value added by each activity along the way, thus catching all the various pieces that end up constituting the final product of the economy.

**Table 2. Economic Growth in the 10 Most Populous Countries 1975–2001**

	Population, 2001 (millions)	Growth Rate (% per Year)		
		Population	GDP Per Capita	Total GDP*
China	1,285.2	1.3	8.2	9.5
India	1,033.4	2.0	3.2	5.2
United States	288.0	1.0	2.0	3.0
Indonesia	214.4	1.8	4.3	6.1
Brazil	174.0	1.8	0.8	2.6
Russian Federation	148.9	1.3	-1.2	0.1
Pakistan	146.3	2.8	2.7	5.5
Bangladesh	140.9	2.4	2.3	4.7
Nigeria	117.5	2.9	-0.7	2.2
Mexico	100.5	2.0	0.9	2.9
Total or average	3,649.1	1.6	4.5	6.1
Excluding China	2,363.9	1.7	2.6	4.3
World	6,130.1	1.6	1.2	2.8

Source: UNDP (2003); table 5 for total population and annual population growth rate; table 12 for annual growth rate of GDP per capita

\* = column 2 + column 3

**Table 3. Growth Champions, 1975–2001**

	Growth Rate (% per Year)		
	Population	GDP Per Capita	Total GDP*
China	1.3	8.2	9.5
Korea	1.1	6.2	7.3
Thailand	1.5	5.4	6.9
Singapore	2.3	5.1	7.4
Vietnam	1.9	4.9	6.8
Hong Kong	1.7	4.5	6.2
Indonesia	1.8	4.3	6.1
Ireland	0.8	4.2	5.0
Chile	1.5	4.1	5.6
Malaysia	2.5	4.1	6.6
World	1.6	1.2	2.8

Source: UNDP (2003); table 5 for annual population growth rate; table 12 for annual growth rate of GDP per capita.

\* = column 1 + column 2.

**Table 4. Merchandise Exports of Growth Leaders, 1975–2001 (U.S. Billions)**

	1975	2001
China	6.9	266.1
Korea	7.7	150.4
Thailand	2.2	65.1
Singapore	5.4	121.8
Vietnam	0.2	15.1
Hong Kong	8.5	189.9
Indonesia	8.5	56.4
Ireland	3.2	83.0
Chile	1.6	18.3
Malaysia	3.8	88.0
Group Total	48.0	954.1
World Exports	816.5	6,129.0
Leaders' Share of World Exports	5.9	15.6

Source: International Monetary Fund, *International Financial Statistics*.

The scientific approach to measuring growth, which has been used over the past 50 years or more, breaks it down into five components:

- added labor
- improved quality of labor (through education, training, experience, etc.)
- added capital (net investment during a period)
- the rate of productivity of capital<sup>3</sup>
- an extremely important fifth component that goes by various names, including technical advance, change

<sup>3</sup> For example, invest 10 percent of your income at a rate of return of 10 percent and you get a 1 percent (10 percent × 10 percent) increase in income. Invest at a 20 percent rate of return, and your increment is 2 percent (10 percent × 20 percent).

in total factor productivity (TFP), shift of the production function, or what I like to call real cost reduction (RCR)

Why the label *real cost reduction*?

- RCR is something every business executive understands and identifies with.
- RCR serves as its own justification: for a businessperson to seek to reduce costs is just as natural and self-justifying as for consumers to look for ways to increase the satisfaction they get out of their income and their assets.

Why is this idea important? Because too many economists have for too long sought simple explanations of productivity increases. Once one realizes that real cost reduction is something every business seeks, it is immediately appar-

ent that it can take a thousand forms:<sup>4</sup> one can mechanize loading, computerize payrolls, downsize operations, outsource goods and services, change management styles, add or subtract a shift, shift from metal to plastic, introduce incentive bonuses, or move to piece rates. For example, in El Salvador, I was being shown through a *maquila* operation for assembling blue jeans. The scene was a shed, almost an open-air operation, but with a roof to protect it from the daily rains. Some 200 women were at work, each at a sewing machine. As I watched, I heard music coming from a set of loudspeakers in the roof. When I remarked on this to the owner, he replied, “Yes, and would you believe it—when I installed the music system, productivity went up by 20 percent!”

Clearly, real cost reduction can take place in a thousand ways, but always it is something that business people are actively searching for. Once this concept is recognized, it becomes easy to see how the incentive to reduce real costs can be blunted or even destroyed:

- In public enterprises, managers often get into trouble when they find labor-saving ways to cut costs.
- In monopolies, regulation may provide a guaranteed rate of return, leading managers to not care about reducing costs.
- In highly protected industries, owners and managers may be free from the challenges of competitors. Many end up enjoying a life of ease while high

<sup>4</sup> Note that RCR applies to products at the high as well as low end of the market.

import tariffs guarantee safe, steady profits.

In summary, the five principal ways to generate growth are using more labor, using labor of greater skill and capacity, adding capital via net investment, finding investments of high real rates of return, and continually finding new ways to reduce real costs. All occur at the level of the productive enterprise, and so it is there that the real action of economic growth takes place.

## The Role of Economic Policies

The preceding pages make clear that economic policies do not by themselves typically create economic growth. In my opinion, strong education policies come closest to driving growth by raising the skills and capacities of a country's labor force. But today's educational activity does not begin to bear fruit for some 10–15 years, when the people who are now being educated finally enter the labor force. Then, of course, the tree bears fruit for 30, 40, or even 50 years. But, in general, economic policies typically do not determine any element in the growth process. Rather, they operate to permit or impede these elements. In sum, one should not seek mechanical connections between economic policies and economic growth. One should instead think of the policy framework as creating an atmosphere or environment that can be helpful to—or impede—enterprises as they seek productive investments and new ways of reducing real costs. Thus, the connection between policy and growth

is permissive rather than deterministic, and conducive rather than mechanical. Does this mean policy is unimportant or that we can forget about it or relegate it to a low priority? Not at all!

The easiest way to show the importance of economic policy is to trundle out a host of cases where bad policies brought an economy to ruin—Chile under Allende, Peru under Alan García, Indonesia under Sukarno, Nicaragua under the Sandinistas, and a dozen or more African countries over the last 25 years. It is not in the interest of even a predatory state to kill the goose,<sup>5</sup> yet that is indeed what happened with Allende, García, Sukarno, and the rest.

Countries can create a policy environment conducive to growth in the following ways:

- Keep inflation under control.
- Open the economy to competition from abroad.
- Try to keep policies from distorting or masking the true real costs of the economy's goods and services—both outputs and inputs. People have to see real prices and costs clearly in order to identify the most productive investments and to find opportunities for real cost reduction.
- In short, they can adopt the recommendations of the Washington Consensus.<sup>6</sup>

<sup>5</sup> See Lal (2001).

<sup>6</sup> This term was coined by John Williamson and refers to a public policy agenda aimed at creating an environment in which market forces are given ample scope to generate economic efficiency and growth.

## The Results of Good Policies

What is good economic policy? We should know the answer by now, for policy has been at the center of a great deal of economic analysis from the time of Adam Smith and even earlier. Can we count on good policies leading to steady growth at 6 or 7 percent per annum? History says no: *growth typically comes in spurts*. To see why, let us examine the growth process in more detail.

Many economists have delved into the empirical study of growth, particularly in recent decades. The results reported here are compatible with the great bulk of the findings of others, but they differ somewhat in emphasis. In any case, they represent our own work and our own focus. The first important conclusion is that it is very difficult to predict future winners. We already know this from the stock market, but it also applies to real cost reductions. For example, in the U.S. economy, industries that win the RCR race in one decade typically do not in the next. In the United States, winners in 1948–58 were communications, public utilities, and farming. The winners in 1958–67 were lumber and wood products, railroad transportation, textiles, and electrical machinery. The winners in 1967–76 were finance and insurance, apparel, communications, and chemicals.<sup>7</sup>

<sup>7</sup> See Harberger (1998, 6). Basic data are drawn from Kendrick and Grossman (1980). Industries were ranked by percentage of RCR during the indicated period. Those shown are the top-ranked four for each period.

Notably, the set of winners has changed completely from one period to the next. Only communications appears twice, but not in adjacent periods. Also notable is that the pharmaceutical industry does not regularly emerge as a leader. Many would expect it would because of the great amount of resources this industry devotes to research and development. Pharmaceuticals are not RCR champions, however, because the gains made as a result of their research are largely offset by the cost of those very efforts. They appear to get a normal rate of return on research and development costs. To the extent this is the case, we do not have true real cost reduction or productivity improvement.

A second important generalization from our work is that one firm's meat is another firm's poison. The winners' rate of return goes up as they reduce real costs, while their competitors typically lose market share and suffer reduced rates of return and even outright losses. Losing firms typically suffer negative RCRs, that is to say, increased real costs, because they are driven back to reduced volumes of output as demanders abandon them in favor of the innovators.<sup>8</sup> The idea of negative real cost reductions, or reduced total factor productivity, may seem strange at first, but one gets more and more comfortable with it as one thinks of different real-world cases:

- Foreign steel almost killed U.S. producers who stuck too long to outmoded technology.
- Wal-Mart and Target actually did kill many old department stores.

<sup>8</sup> For more detail, see Harberger (1998, 6–18).

- Supermarkets killed most mom-and-pop grocery stores.

What we are witnessing is the true story of growth, for which Joseph Schumpeter coined the insightful phrase “creative destruction.” The victory of the new and destruction of the outmoded are the essence of the growth process in a well-functioning market economy.

### Effects of Trade Liberalization

Good trade policy is at the center of good economic policy. The message of market economics, ever since the days of Adam Smith and David Ricardo, has been that freer trade permits an economy to make better use of its resources. In fact, much economic analysis is spent examining the efficiency costs and gains arising from different kinds of policies such as tariffs, taxes, subsidies, incentive schemes, agricultural programs, minimum wages, price controls, and domestic content requirements. A key characteristic of such policies is that they typically introduce distortions that saddle the economy with more costs than benefits. Import tariffs are a classic example of policy-induced distortions. However, freer trade and other liberalizing measures reduce the force of these distortions and bring more benefits than costs.

Second, and very importantly, the main effect of introducing or eliminating distortions is to alter the level of economic output, not its period-after-period rate of growth. It is instructive to note that the standard analysis of free trade and tariffs says nothing about

the growth rate and instead talks about economic efficiency. The rate of growth is affected as the economy transits from one level of activity to another, but the permanent effect is on the *level*, not on its *period-after-period rate of growth*. Take the example of a 50 percent import tariff and an exchange rate of 10 pesos = \$1. The economy is saying to producers that they can safely use up to 15 pesos of resources to produce a product and be protected from competition from a similar imported product (costing \$1 in world markets). At the same time, it says they can use only up to 10 pesos to produce an additional \$1 by expanding exports. This example shows clearly why import tariffs are inefficient. Cut import substitution by \$1 million and as much as 15 million pesos of resources are released (from activities protected by the 50 percent tariff). Yet, this same value of resources dedicated to export activities could generate as much as \$1.5 million of export revenue.<sup>9</sup>

Another example, from my experience in Beijing in 1983, illustrates comparative advantage and how free trade contributes to more efficient allocation of economic resources. China's two main banks sent carefully selected employees—but none with training in Western-style market economics—to an intensive course on project evaluation sponsored by the World Bank. At that time, almost the only cars to be seen on the streets were Chinese versions of the 1942 Pontiac sedan, for which the dies and machinery had decades earlier been shipped to China. These cars weighed

<sup>9</sup> This assumes that the resource costs of import substitute products can be as high as the duty-inclusive price of the corresponding imports.

about two tons and had a voracious appetite for fuel. Sprinkled among these behemoths, however, were a few contemporary Toyotas. The contrast was such that any visitor would notice it. But the point of the conversation was our Chinese participants' observation that "We started doing some calculations on autos. And we found that if we reduced by a certain amount the resources being used to make these big old cars, increased the resources in the textile and shoe industries by a similar amount, and then exported the textiles and shoes that these shifted resources produced in their new location, we could use the proceeds to buy two brand-new Toyotas for every big old car we had given up." The two participants had rediscovered, all by themselves, the essence of the principle of comparative advantage: creating more value for the same value of resources.

The benefits of trade liberalization can be illustrated in the same way. If a country has a 50 percent uniform tariff and an exchange rate of 10 pesos = \$1, a dollar's worth of imports sells for 15 pesos, while the dollar's worth of exports only brings the exporter 10 pesos. Reducing the tariff to 40 percent will stimulate trade, with the extra exports (costing 10 pesos per dollar) paying for extra imports valued at 14–15 pesos per dollar. The excess of this benefit (14–15 pesos) over the cost (10 pesos) of the extra export dollars represents the gain from the tariff reduction.<sup>10</sup>

<sup>10</sup> This is because when the tariff is lowered on a product that was previously price protected, there will be some new imports of that product, although there will still be local production that will now have to compete with a tariff-inclusive price of 14 pesos.

Using the same principle, consider a truly major trade liberalization such as reducing a uniform tariff from 50 percent to 10 percent. Suppose, too, that this reform generated a spectacular increase in trade, with exports going from 10 percent to 30 percent of GDP, and with trade being balanced both before and after the change. The gain to the economy from such a major trade liberalization would amount to 6 percent of GDP.<sup>11</sup> Some people find it sobering, even disappointing, when they learn that the consequence of such a major liberalization is a benefit of "only" 6 percent of GDP. However, they should realize that this benefit will go on indefinitely into the future.

If GDP were not to grow at all, the present value of this 6 percent improvement would be 60 percent of GDP at a 10 percent discount rate and 120 percent of GDP at a 5 percent discount rate (present value = annual benefits ÷ discount rate). If GDP is growing at 3 percent per year, the estimated present value of the same 6 percent benefit gets bigger. At a 10 percent discount rate it amounts to 86 percent of the first year's GDP, and at a 5 percent discount rate it goes to a whopping 300 percent of the first year's GDP (present value = first

<sup>11</sup> This is obtained by considering that the "first" increment to trade has a cost of 10 pesos per dollar and a benefit of 15 pesos per dollar (reflecting the initial 50 percent tariff), while the "last" increment to trade has a cost of 10 pesos and a benefit of 11 pesos per dollar. The "average" net benefit is thus equal to 30 percent [(50 percent + 10 percent) ÷ 2]. Applying this average net benefit to the increment of exports (20 percent of GDP), we obtain 6 percent of GDP as the overall benefit of the liberalization.

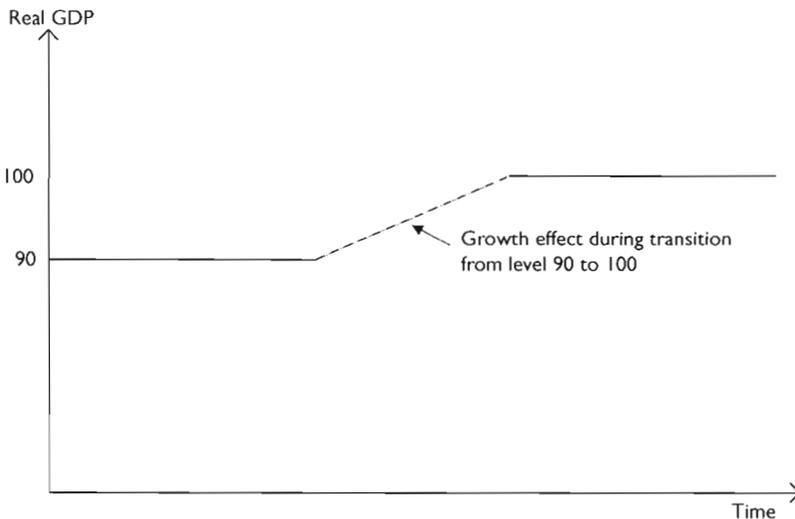
year's benefit ÷ [discount rate – rate of growth of benefit]).<sup>12</sup>

This example shows the substantial potential impact on GDP from trade liberalization. But note that this result does not posit any permanent change in the growth rate as a result of liberalization; rather, trade liberalization affects the *level* rather than the *rate of growth* of GDP. The rate of growth is not totally unaffected, but it changes only as a result of the transition from one level to another (see figure 1).

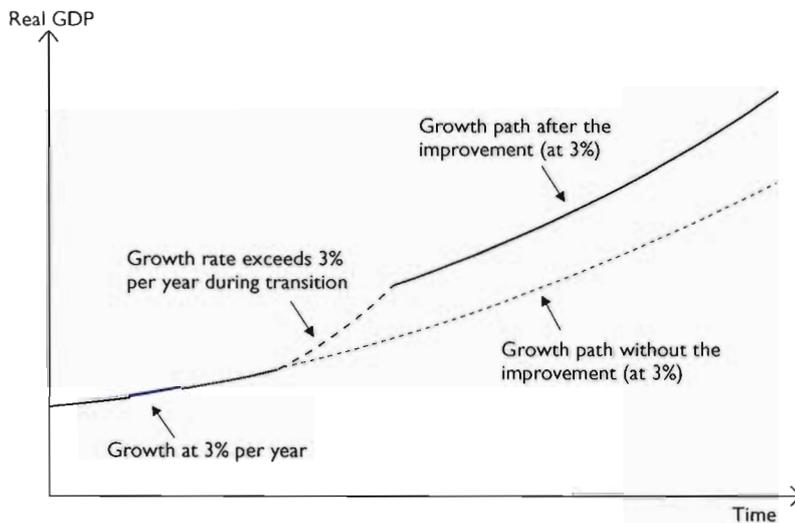
I cannot leave this topic without adding what may be a significant qualification. I earlier emphasized the important role that real cost reduction plays in the growth process: it is the factor that best discriminates between good and bad growth experiences and is a constant, never-ending objective of businesspeople. It is also reflected in thousands of ways and very difficult to predict. With these complications serving as caveats, we can say that competition typically

<sup>12</sup> In the calculation above, the assumption was that in the first year of liberalization, we see the full gain of 6 percent of a year's GDP. That would mean that if the economy were growing at 3 percent normally, then for that one year there would be a growth rate of 9 percent, with the 3 percent growth rate prevailing from year 2 onward. This is grossly unrealistic, as the effects of trade liberalization are realized only gradually, as major resource reallocations move toward export activities and away from import substitution in previously protected sectors. A more likely scenario would be 3 percent growth up to year 1, and then, say, 4 percent growth from years 1–6, followed by a resumption of 3 percent growth thereafter. An alternative would be 3.5 percent growth from years 1 to 12, again with a resumption of 3 percent growth thereafter. Both of these scenarios provide a cumulative gain of 6 percentage points of GDP, with the gain spread over a transition period (of 6 or 12 years in the cases cited) rather than packed into just one year (as in the original example).

**Figure 1a. Effects of a Trade Liberalization, Educational Improvement, or Real Cost Reduction on the Growth of GDP: A Simple “Change in Level”**



**Figure 1b. Effects of a Trade Liberalization, Educational Improvement, or Real Cost Reduction on the Growth of GDP: A New “Improvement” Is Superimposed on an Economy Where Other Forces Lead to Growth of 3% per Year**



operates to stimulate RCR. This effect stems from the fact that competition typically makes people work harder, strive more, and put out more effort. Thus we expect that in the more

competitive situation that prevails after trade liberalization, people in affected industries will work harder to reduce real costs than they would under the umbrella of protection. There is modest

but inconclusive evidence to support this assertion.<sup>13</sup>

In sum, we can be quite sure that although freer trade brings greater efficiency, it does not automatically lead to higher growth rates. Enough countries have joined the freer trade group so that a large permanent effect on growth rates should be readily visible. We must therefore presume that while some permanent effect probably exists, freer trade is only one of many factors accounting for observed rates of RCR.

### Growth as an Accumulation of “Changes in Level”

An important recurring theme in economic growth is that an improvement in any one (or more) of its components (the labor contribution, the capital contribution, and the contribution of real cost reduction) will likely generate a permanent rise in the level of GDP, but only a blip in the growth rate. Raising the growth rate for an extended period requires a series of such blips, coming one after the other in rapid succession. And each blip requires its own push of extra effort. Extra growth does not come easily. It takes work—lots of work—opening new vistas period after period. It is wrong, often badly so, to think that big improvements in the growth rate will come automatically, as the concept of self-sustaining growth appears to imply.

<sup>13</sup> It is very difficult to distinguish between the transitional effect on the growth rate and the more lasting effect to which this paragraph refers.

Let us look at three examples of the growth process: adding new investment; increasing the quality, skill, and knowledge of the labor force; and introducing cost-reducing innovations. In each example, growth is generated by changing the level of GDP, not its long-term rate of growth. We have already seen how trade liberalization works mainly in this way.

**Example 1:** Adding a new investment of 1,000 to the economy with a 15 percent rate of gross return results in a flow of gross benefits of 150 at the start. This contribution will likely decline by 5 percent per year as the investment depreciates (assuming a 10 percent rate of net return and a 5 percent per year depreciation rate). If the depreciation is straight-line for 20 years, the expected flow of gross benefits from the investment would start at 150 and drift downward over the project's 20-year life. In general, each investment can be thought of as giving a positive pulse to the growth rate (+150 in these examples) followed by a series of small negative impacts as the contribution of this investment to GDP (its gross-of-depreciation rate of return applied to a capital value that diminishes year by year) declines. An extreme case would be an investment of the so-called "one-horse-shay" variety that produces a constant service yield (S) throughout its life and then collapses all at once. Here the impact would be a positive jump of +S in period 1, with zero contribution to growth thereafter, followed at the end of period N by a negative jump of -S.

**Example 2:** We add to the education level of the labor force of the country,

increasing its earning power by, say, 12 percent. If labor's contribution to GDP was initially 500 out of a GDP of 1,000, this change would raise it to 560, producing a 6 percent rise in GDP. (I constructed this example so as to yield precisely the same increment to GDP as the trade liberalization discussed in the previous section.) We get the same effect: in a zero-growth setting, the present value of the benefits of this change would, in the simplest case, be 600 if we use a discount rate of 10 percent<sup>14</sup> and 1,200 at a discount rate of 5 percent.<sup>15</sup> If this change were superimposed on a path in which GDP was growing at 3 percent, its present value would be about 860 at a 10 percent discount rate<sup>16</sup> and 3,000 at a 5 percent discount rate.<sup>17</sup> Those calculations are based on a 6 percent extra jump of GDP in year 1, leading to 9 percent<sup>18</sup> growth in that year followed by 3 percent growth thereafter. The more likely scenario for such a change would be an extra 0.5 percent growth over 12 years, or an extra 0.25 percent growth over 24 years as successive new cohorts of better-educated people joined the labor force.

**Example 3:** Consider a cost-reducing innovation that leads to an increase of real product from 1,000 to 1,060 using the same resources as before. If the innovation is introduced over an extended period (as was the case with hybrid corn, antibiotics, the assembly line, computer-

ization, as well as with just about every other innovation), the extra growth will be spread over time as in the earlier examples, leading to an extra 1 percent of growth over 6 years, an extra .5 percent over 12 years, or an extra .25 percent over 24 years. Again, the same figures as before apply. In a stagnation setting, where GDP is not growing, we have a steady stream of 1,000 being converted to a steady stream of 1,060, with growth only occurring in the transition from the 1,000 level to the 1,060 level.<sup>19</sup>

What lessons can we draw from these examples? First, a "standard" impulse of growth, regardless of whether it impacts the capital contribution, the labor contribution, or the contribution of real cost reduction, will typically operate via a "level effect," increasing the growth rate over a transition period, but not permanently.<sup>20</sup>

The second lesson is that to raise the growth rate permanently, we must keep introducing new impulses to growth. If we raise the average level of education from 8 to 9 years, we might achieve growth of 3.5 percent instead of 3 percent for something like a decade. To keep it at 3.5 percent by this route, we would have to make additional efforts, bringing average education, say, from 9 to 10 years for the next decade and from 10 to 11 years for the one after that.

<sup>14</sup> Present value is  $60/0.10 = 600$ .

<sup>15</sup> Present value is  $60/0.05 = 1,200$ .

<sup>16</sup> Present value is  $60/(0.10 - 0.03) \approx 860$ .

<sup>17</sup> Present value is  $60/(0.05 - 0.03) = 3,000$ .

<sup>18</sup> 3 percent + 6 percent = 9 percent.

<sup>19</sup> In a growth setting, we shift from a stream starting at 1,000 and growing at 3 percent to a stream starting at 1,060 and also growing at 3 percent. In the simplest case, the growth rate leaps to 9 percent for a single transition year, with no alteration of the 3 percent growth rate thereafter. In more realistic cases, the transition would extend over a much longer period.

<sup>20</sup> Readers may again refer to figure 1.

With physical capital, if we add one increment of net investment this year in a standard pattern, it has to be followed by another the next year and yet another the year after that. This is already captured in our way of representing the capital contribution to the growth rate, where the ratio of net investment to GDP appears as one of the two components of this contribution. Adding to the rate of investment for just one year produces just a blip in the economy's rate of growth. For a permanent effect, we have to be shifting the year-after-year rate of net investment from, say, 10 percent of GDP to 12 percent. At a 15 percent gross rate of return, this *permanent* upward shift in the investment rate will change capital's contribution from 1.5 percent per year to 1.8 percent per year, i.e., it will add 0.3 percent per year to the country's growth rate. But this means a different extra 2 percent of GDP being invested in different new investments in every successive year. The 0.3 percent effect on the growth rate is the composite result of a perpetual chain of extra annual investments, each of which is contributing only a "level effect." To reiterate, these examples illustrate the important point that, normally, improvements in growth generate a permanent rise in the level of GDP, but only a blip in the growth rate.

The idea of "self-sustained growth" can be seriously misleading, because elements that produce growth do so by changing the level of GDP, as opposed to impacting its growth rate as such. The exception occurs when a whole set of bad policies have been artificially holding down the natural forces of growth. For example, bad labor policies

can deprive employers of the incentive to hire additional workers, bad education policies can end up producing only tiny increments of productivity and earnings, widespread corruption and arbitrary interference with economic processes can lead to savings being invested outside the country, rampant inflation can blur people's perceptions of relative prices and costs, and major price distortions can cause people to miss genuine opportunities to reduce true real costs while pursuing false opportunities stemming from the wrong price signals. In short, every single component of a country's growth rate can be held down by wrongheaded policies. Such situations can yield negative, zero, or miniscule growth rates for extended periods of time.

When a sensible set of reforms takes away these kinds of trammels to the efficient functioning of the economy, one can get first a significant spurt of growth as distortions are eliminated and as advantage is taken of long-neglected opportunities. But even after this phase of "recovery" or "emergence from the morass," there may be a permanent effect on the country's growth rate as it moves from negative, zero, or miniscule up to the "normal" range of something like 3 percent. This range reflects normal rates of investment, normal rates of return, normal growth of the labor force and its quality, and normal rates of success in the constant search for ways to reduce real costs. This kind of normal growth can legitimately be called self-sustaining, but it represents the functioning of natural forces. Government policies can and should open the door to these forces but by and large cannot create them.

## The Role of Creative Destruction

Joseph Schumpeter captured the story of the growth process in the insightful phrase "creative destruction." The victory of the new and destruction of the outmoded are the essence of the growth process in a well-functioning market economy. Successful innovators are the big winners. Let us visualize the workings of creative destruction in three examples: standard commodities, differentiated products, and international competition (which, in a sense, overlaps the first two).

**Example 1:** Hybrid corn provides us with an easy scenario for standard commodities. As hybrids began to be introduced in the 1930s, some farmers were ready to take a chance and plant the new varieties. Those that were successful made a lot of money, and their neighbors and others proceeded to imitate them. As corn supplies grew, the relative price of corn fell, and the benefit of the innovation—at first reflected in high profits for the hybrid-planting farmers—was in the end passed on to consumers in the form of lower relative prices and higher quality of corn.

Before prices began to fall, farmers who planted the old varieties of corn were substantially unaffected. But as prices fell (relative to costs) they found themselves squeezed. For early adopters, the shift to hybrid corn meant higher profits (which then dropped gradually back to "normal" as prices fell). For late adopters, it was a question of dealing with growing losses as prices fell. For them, shifting to hybrids was a matter of simple survival; in the end, they could

not make it if they stuck with the old, traditional, but now inferior varieties of corn.

This is the “big picture” of the hybrid corn revolution, but the little picture is equally germane. It so happens that given hybrids were successful only in certain areas. Often, as farmers tried to follow the lead of those in neighboring counties, they found that the hybrid that worked in one county sometimes failed in the county next to it. Many farmers tried specific hybrids (that had done well in the experiment stations) only to find that they were ill-suited to local soil and weather conditions. These cases resulted in reduced profits and real cost increases.

**Example 2:** The example of differentiated products is well illustrated by how supermarkets squeezed out old-fashioned mom-and-pop retail food stores, and how chains such as Wal-Mart, Target, and K-Mart brought a lot of traditional department stores to a painful and protracted extinction. Another example is when competitors develop different technologies and one loses out to another, as Sony’s Betamax lost out to the VCR<sup>21</sup> and as the VCR is being replaced by the DVD. Sometimes it is a business plan that wins out—as IBM’s computer strategy of licensing its technique to other manufacturers won out over Apple Computer’s go-it-alone strategy. The main point is that it is pretty hard to think of a major cost-reducing innovation that worked so

evenly on all producers at the same time that there were no losers. Losers are generally an integral part of the picture, and their losses typically give rise to real cost increases that partially offset the gains from the real cost reductions of the winners. In a dynamic economy with rapid growth generated by lots of RCRs, there are likely to be quite a lot of real cost increases suffered by competitors. The end result is typically either that the competitors go out of business or they follow the innovators and adopt the innovation.

**Example 3:** International competition warrants special mention because of the political overtones it carries. When winners and the losers are from the same country, the beneficence of an innovation is easier to defend. However, when the increased competition comes from abroad, an entire phalanx of resistance is very often formed by the threatened domestic producers, and the protectionist snake is once again poised to strike.

The world has been lucky in recent decades to have resisted protectionist pressures as well as it has. Economists are well aware that the ultimate beneficiaries of real cost reductions are the world’s consumers; and in some deep sense, the benefits of an innovation enjoyed by consumers will in the end outweigh the costs borne by labor and capital in the activities that are threatened. But it would be wrong for us to be Pollyannaish free-marketers, telling threatened textile workers or steelworkers that all will be well for them in the end. By far the better approach would be to recognize their problems as real, but then to point out that the solutions typically suggested nearly all involve

protectionism in some form or other, and almost always carry economic costs that far exceed their benefits.

Competition from abroad—in the form of lower prices for steel, shoes, textiles, or whatever—is indeed a benefit for consumers, wherever they are located. This same competition is also a threat or—more positively—a “challenge” to other producers of the same or competing products. As such it can generate real cost increases induced by declining demand and can easily lead to mediocre growth performance. We are seeing something of this sort as the world responds first to the challenges posed by the original Asian tigers, and now to the similar but even stronger challenges emerging from China and India as they become world centers for low-end manufactures as well as certain services. Life is tough for the sectors that compete in these products, even in countries not specialized in them. But certainly life is tougher in countries that are more heavily specialized in these low-end products than in those lucky enough to have comparative advantage in other areas. The booms now underway in China and India, for example, have helped trigger rises in the relative prices of many primary products. They have helped the world’s producers of oil and copper, while making life quite difficult for producers of low-end manufactures. I regard all these effects as being almost “acts of God,” like hurricanes, earthquakes, floods, and wildfires. We all should accept these things as part of reality and then figure out how best to respond.

We can draw useful lessons from this analysis by sensitizing ourselves to these

<sup>21</sup> This is the case of an inferior technology winning with a better business plan. Indeed, the verb *betamax* denotes an inferior technology beating out a more advanced one.

realities. For example, we do not expect outstanding growth performance from Honduras when half its banana trees have been blown down by a hurricane. Similarly, we should not expect great performances from El Salvador or Mexico when those countries' main products are beset by major competition from Indonesia, China, and India. Finally, we should understand that Chile's outstanding growth performance of recent years—which owes a great deal to a set of very sound economic policies—has also benefited from a booming demand for copper emanating largely from China and East Asia. If we maintain a careful and subtle appreciation of the circumstances of each country, we will end up being far better judges of the quality of its policy performance. In short, policy should not be judged on the basis of growth performance alone.

## Infrastructure and Economic Growth

Infrastructure plays an important role in economic growth, but the literature rarely embarks on a serious, detailed discussion of the subject. First, it is important to recognize that the measured rate of return on infrastructure investment determines its measured contribution to growth. Rates of return can differ according to sector, as can be seen when capital's contribution to growth is disaggregated into its sectoral components. Differences in rates of return in different sectors can stem, for example, from differences in tax treatment and in depreciation rates on different types of investment. Thus we have corporate income taxes that are paid only in the

corporate sector. At the same time, the housing sector typically benefits from tax exemptions (especially with respect to the imputed rental income from owner-occupied housing) and from outright subsidies, such as those for low-income housing.

It is important to note that the rates of return we refer to here, and in growth accounting generally, cover only those flows actually captured in GDP as measured in the national accounts. These accounts include (in principle) all flows that are paid for (e.g., rents, leases, profits, interest payments) plus a few that are imputed (e.g., rents on owner-occupied housing).<sup>22</sup> Public infrastructure investments often generate returns to capital that are not counted in national accounts. So even in cases where public investments are fully justified, we can expect their measured and attributed rates of return to be significantly lower than those we measure for private enterprises.

For example, consider the case of a public highway that improves access within a major metropolitan area. Unless it is a toll road, the methodology of growth accounting will not attribute any growth contribution to the highway once it is built. In reality, however, it may actually play an important part in facilitating growth and improving the welfare of the country's citizens by reducing the costs of trucking and other transport operations. The national accounts will not assign these contributions to the highway infrastructure project, although

the benefits would be captured when the real cost reduction component of growth for buses, taxis, and commercial trucking activities is measured.<sup>23</sup>

Different public investments will have different proportions of their benefits reflected in actually measured contributions to growth, attributed directly to them (via tolls on roads and bridges, sales from public utility enterprises, etc.). They will also have different proportions of their benefits reflected in growth that is measured but attributed to some other activity (e.g., as RCRs in the trucking industry). And, finally, different proportions of benefits will be of types not captured at all in measures of GDP growth (e.g., the amenity values of public parks and highway beautification projects, the cultural values of projects that preserve historic sites, or the benefits of highway improvements to noncommercial travelers).

For example, consider that a 10 percent measured rate of return to net (public plus private) investment of 3,000 might reflect a 4 percent measured and attributed return on public investments of 1,000, together with a 13 percent measured and attributed return in private investments of 2,000. Equally, it might reflect a 5 percent measured and attributed return on 1,500 of public investment, together with a 15 percent

<sup>22</sup> See example in appendix 1, "Capital Contribution to Growth."

<sup>23</sup> Another important benefit of highway projects is the time saved by commuters and others traveling in their own cars on noncommercial trips. Yet since these trips are not counted as part of a country's GDP, neither would these savings. However, a proper cost-benefit analysis judging the overall benefits of the project would certainly count such savings.

return on 1,500 of private investment.<sup>24</sup> This applies even when the “true” rate of return on public investment is equal to that applying in the private sector, and even more so in many real-world cases where poor methods of designing and choosing public sector projects lead to true rates of return that are much lower than those of the private sector—or even negative in many cases.

The importance of these considerations will vary from country to country depending on the share of public investment in the total investment done in each country and on the quality (as reflected in the “true” rate of return) of that public investment. Table 5 gives information on the importance of public investment in a large number of developing countries, both in relation to GDP and as a fraction of total investment.<sup>25</sup> As the table shows, total investment in developing countries tends to be 15–30 percent of GDP. When public investment is expressed as a percentage of total investment, about half of the observations lie between 20 and 40 percent (final column).

## Exploring Successful Growth Episodes

**W**hat makes for successful growth performance? We have tried to explain

<sup>24</sup> Appendix 1, “Exploring Successful Growth Episodes,” reports on empirical exercises that assume an average real net rate of return of 10 percent per annum on a country’s total net investment. Readers should be aware that this assumption implies a significantly higher real return on that part of total investment carried out by the private sector.

<sup>25</sup> We cannot here provide data on the quality of the public investment.

**Table 5. Gross Investment as Percentage of GDP, Average 1990–99**

	<b>Total Investment (% of GDP)</b>	<b>Private Investment (% of GDP)</b>	<b>Public Investment (% of GDP)</b>	<b>Public Investment (% of Total Investment)</b>
Argentina	17.75	15.74	2.01	11.32
Azerbaijan	30.84	27.46	3.38	10.96
Bangladesh	19.12	12.42	6.71	35.09
Barbados	15.57	11.12	4.47	28.7
Belize	24.64	11.75	12.88	52.27
Benin	15.76	8.10	7.67	48.67
Bolivia	16.79	8.86	7.95	47.35
Brazil	20.11	15.78	4.34	21.58
Bulgaria	15.13	4.25	10.88	71.91
Cambodia	12.08	8.06	4.02	33.28
Chile	23.44	18.07	5.39	23.00
China	32.89	13.87	19.04	57.89
Colombia	18.47	10.83	7.62	41.26
Comoros	16.40	9.04	7.37	44.94
Costa Rica	20.50	15.66	4.80	23.42
Côte d’Ivoire	12.15	7.89	4.26	35.06
Dominica	29.32	18.57	10.75	36.67
Dominican Republic	22.18	14.73	7.44	33.54
Ecuador	18.67	12.26	6.41	34.33
Egypt	19.03	11.86	7.19	37.78
El Salvador	16.58	13.11	3.41	20.57
Estonia	27.88	23.88	3.99	14.31
Grenada	33.55	25.52	8.03	23.93
Guatemala	14.85	12.19	2.69	18.11
Guinea-Bissau	25.65	7.58	18.10	70.56
Guyana	32.62	17.11	15.53	47.61
Haiti	8.15	4.46	3.69	45.28
India	22.19	14.55	7.69	34.66
Indonesia	26.68	18.75	7.93	29.72
Iran	22.39	12.71	9.68	43.23
Kazakhstan	16.50	14.13	2.37	14.36
Kenya	18.59	11.27	7.27	39.11

**Table 5. Gross Investment as Percentage of GDP, Average 1990–99**

	<b>Total Investment (% of GDP)</b>	<b>Private Investment (% of GDP)</b>	<b>Public Investment (% of GDP)</b>	<b>Public Investment (% of Total Investment)</b>
Korea	35.07	29.47	5.60	15.97
Lithuania	23.44	13.46	9.98	42.58
Madagascar	11.88	5.35	6.54	55.05
Malawi	14.79	5.57	9.18	62.07
Malaysia	36.07	23.88	12.20	33.82
Mauritania	18.58	7.63	10.94	58.88
Mauritius	27.60	19.41	8.20	29.71
Mexico	18.97	15.40	3.55	18.71
Morocco	22.13	13.52	8.60	38.86
Namibia	21.16	13.07	8.10	38.28
Nicaragua	25.93	13.23	12.71	49.02
Pakistan	16.94	9.31	7.63	45.04
Panama	22.43	18.93	3.50	15.60
Papua	23.88	18.98	4.86	20.35
Paraguay	22.47	17.53	4.93	21.49
Peru	20.50	16.21	4.30	20.98
Philippines	22.16	17.42	4.74	21.39
Poland	18.27	9.10	9.15	50.08
Romania	15.96	5.30	10.68	66.92
Seychelles	30.20	20.33	9.87	32.68
South Africa	16.21	11.21	4.98	30.72
St. Lucia	23.89	13.59	10.30	43.11
St. Vincent	28.98	17.86	11.14	38.44
Thailand	37.41	28.63	8.76	23.42
Trinidad	20.80	15.86	4.94	23.75
Tunisia	27.02	14.88	12.13	44.89
Turkey	24.32	18.09	6.22	25.58
Uruguay	14.03	10.04	4.00	28.51
Uzbekistan	31.47	11.00	20.43	64.92
Venezuela	17.67	8.16	9.53	53.93
Yugoslavia	12.10	10.60	1.50	12.40

Source: Everhart and Sumlinski (2001).

that all the growth we measure takes place at the level of the individual enterprise,<sup>26</sup> and that of the standard components of measured growth, RCR has by far the greatest quantitative importance. Policies enter the picture by supporting various components of growth—they foster the growth of human capital, facilitate the processes by which firms make productive investments, and, above all, create a favorable environment for seeking and implementing RCRs. Market-friendly, liberalizing policies meet these conditions, but each such policy is likely to have only a modest impact on the growth rate over a limited period of time. If any single measure signals that policies are moving in the right direction, it is the growth rate of a country's exports. We have already seen some reflection of this in table 4, but now we explore it in more detail.

Table 6 presents data on a large number of high-growth episodes, covering the period 1960–2001.<sup>27</sup> A high-growth episode is defined as one where GDP growth averages over 4 percent per year for at least five years. In all, we report on 59 high-growth episodes in 41

<sup>26</sup> This does not deny the positive contributions to growth that arise when labor shifts from low- to high-wage activities, or when capital moves from uses with low rates of return to new ones with higher rates. In such cases, we attribute the growth to a reduced factor use in the losing sector, plus an increased factor use (with higher productivity) in the gaining sector.

<sup>27</sup> For details and methodology, see appendix I "Exploring Successful Growth Episodes."

countries.<sup>28</sup> With the exception of the Asian Tigers, which averaged GDP growth rates of 7–10 percent per year, growth rates were nearly all 4–7 percent per year. If one thinks of 7 percent growth as a criterion for success, then the world is full of failures. But under a 4 percent criterion, the picture is quite bright. I believe that good economic analysis, as well as observation of individual cases, support the use of a 4 percent (or even lower) criterion for success.

Table 6 also presents the breakdown of the country's growth rate into a capital contribution, a labor contribution, and a growth component due to real cost reductions. In addition, the table shows the growth rate of exports during each high-growth episode.<sup>29</sup> In comparing high-growth episodes with the experience of other periods, the difference in growth rates between high-growth periods and other times (for the same set of countries) is overwhelmingly accounted for by the contribution of real cost reductions (column 4). We find that there is little difference between the

median capital contributions of the high-growth periods and the corresponding median for the other periods. The same holds true, even more forcefully, for the labor contributions. In the OECD countries, we have a growth-rate difference (between high-growth and other periods) of 2.9 percent per year and an RCR difference of 2.3 percent. For the Asian Tigers, the growth-rate difference is 6 percent per year; the RCR difference is 5 percent. For the other Asian countries, the growth-rate difference is 3.4 percent per year; the RCR difference is 3.2 percent. For the African countries the growth-rate difference is 4.2 percent; the RCR difference is 3.6 percent. And for the Latin American/Caribbean countries, the growth-rate difference is 4.7 percent per year; the RCR difference is 3.8 percent. Can one imagine any more persuasive evidence to convince policymakers of the urgency of creating conditions favorable to firms in their constant search for new ways to reduce real costs?

The final point to be drawn from our discussion on successful growth episodes concerns the speed of export growth. This is not a component of the GDP growth rate in the same sense as the other three (which in each year and episode add up to the observed GDP growth rate). But there are important scenarios that produce the phenomenon of export-led growth. These include *trade-liberalizing* policies by the countries in question, *cost-reducing innovations* by exporters in those countries, and, finally, simply the good luck of *increases in world prices* of those exports expressed in real terms. We can be sure that all three of these scenarios are well represented in the broad panorama

shown in table 6. Some of the export success depicted there surely comes from the luck of favorable price movements. But we can be equally sure that the other two elements (liberalizing policies and reductions in the real costs of exports) also played very important roles. With this in mind, then, we can observe that—again for each group of countries—there is a dramatic difference between the export performance of their high-growth episodes and the export experience of other periods.<sup>30</sup>

We also identified a separate set of low-growth experiences;<sup>31</sup> data from those episodes are presented in table 7. The conclusions are the same as those emerging from our discussion of high-growth episodes: the difference between the median growth rates of the low- and high-growth periods is 7.3 percent, and of that, 6.9 percent is accounted for by real cost reduction. By comparison the differences in the capital and labor contributions are tiny. But again, there is a huge difference between the median rates of export growth—8.6 percent for the good periods and 0.1 percent for the bad. Visual appreciation of the evidence can be seen in figures 2–5. In figures 2 and 3, the upper panel summarizes the

<sup>28</sup> Generally, when there are two or more high-growth episodes per country, they are separated by an episode of less-than-high growth. In a few cases, however, we have high-growth episodes following each other directly. This distinction was made when there was an evident change in the growth trend of the country, as between the two adjacent periods. Short lapses from high growth did not disqualify an episode, but to qualify, each episode had to begin and end with years in which the growth rate equaled or exceeded 4 percent.

<sup>29</sup> Care was taken to avoid two errors often made in studies of economic growth. The first error consists of only counting merchandise exports rather than the total of goods and services exported. The second error is measuring exports in nominal dollars rather than in real units. We were careful to include both goods and services exports in our analysis and to express exports in "real dollars" before calculating their growth rate. Details of this methodology are given in appendix I, "Exploring Successful Growth Episodes."

<sup>30</sup> In the advanced OECD countries 8.8 percent versus 4.7 percent; 10.5 percent versus 5.9 percent for the Asian Tigers; 7.1 percent versus 4.7 percent for the other Asian countries; 6.2 percent versus 1.7 percent for the African countries; and 9.2 percent versus 4.4 percent for the Latin American/Caribbean countries.

<sup>31</sup> These were defined as episodes of at least five years duration, with average growth rates of 1 percent per year or less. We recorded low-growth episodes only for countries that had at least one interval of high growth, which explains the relatively small number of low-growth cases shown in table 7. Tables 6 and 7 facilitate comparisons of growth rates and components of growth for the same set of countries in both low- and high-growth periods (see bottom of table 7).

**Table 6. High-Growth Episodes, 1960–2001**

	Time Period	Average GDP Growth (%)	Average Capital Cont. (%)	Average Labor Cont. (%)	Average Real Cost Red.	Average Export Growth (%)
<b>Advanced OECD Countries</b>						
Australia	1961–73	5.3	1.5	1.3	2.5	8.1
Canada	1965–73	5.1	0.7	1.5	2.9	8.8
France	1960–73	5.4	1.4	0.5	3.5	9.5
Finland	1960–73	5.0	1.8	0.4	2.8	7.5
Greece	1960–73	7.9	2.1	0.1	5.7	12.5
	1993–2000	4.7	0.4	0.0	4.3	12.4
Ireland	1966–78	5.3	1.4	0.4	3.5	8.6
Japan*	1960–90	6.4	4.9	0.6	0.9	11.3
New Zealand	1960–66	5.5	1.4	1.2	2.9	4.2
	1968–74	5.2	1.0	1.2	3.1	6.1
Norway*	1970–77	5.0	2.5	1.0	1.4	7.4
Portugal	1960–73	6.9	1.8	0.1	4.9	9.6
	1975–80	5.1	1.1	1.6	2.3	-2.9
	1985–91	5.5	1.1	0.5	4.3	14.5
Spain	1960–74	7.2	1.7	0.4	5.1	15.2
Median (high-growth periods)		5.3	1.4	0.4	3.1	8.8
Median (same countries, other periods)		2.4	1.1	0.5	0.8	4.7
Difference		2.9	0.3	-0.1	2.3	4.1
<b>Asian Tigers</b>						
China	1962–81	7.8	2.0	1.2	4.5	7.3
	1981–01	9.8	2.8	0.8	6.3	12.3
Hong Kong (China)	1960–97	8.0	2.3	1.4	4.3	11.5
Korea	1960–97	7.9	2.0	1.4	4.6	17.2
Malaysia	1960–87	6.5	1.8	1.6	3.1	5.9
	1987–97	9.3	3.6	1.5	3.1	11.7
Singapore	1964–2000	9.0	2.9	1.6	4.4	10.5
Thailand	1960–86	7.1	2.2	1.5	3.4	8.3
	1986–96	9.5	3.4	1.0	5.1	15.2
Median (high-growth periods)		8.0	2.3	1.4	4.4	10.5
Median (same countries, other periods)		2.0	1.2	0.7	-0.6	5.9
Difference		6.0	1.1	0.7	5.0	4.6
<b>Other Asia</b>						
India	1979–61	5.7	1.5	1.0	3.1	6.8
Indonesia	1967–97	7.4	1.8	1.4	4.2	13.9

\*Japan and Norway are the only cases where the capital contribution is more important than the contribution of real cost reduction.

**Table 6. High-Growth Episodes, 1960–2001**

	Time Period	Average GDP Growth (%)	Average Capital Cont. (%)	Average Labor Cont. (%)	Average Real Cost Red.	Average Export Growth (%)
<b>Other Asia</b> (continued)						
Israel	1960–96	6.1	1.4	1.6	3.1	7.8
Pakistan	1960–96	5.9	1.4	1.5	3.0	6.1
Philippines	1960–80	5.4	1.4	1.5	2.5	7.7
Median (high-growth periods)		5.9	1.4	1.4	3.1	7.7
Median (same countries, other periods)		2.5	1.1	1.4	–0.1	4.7
Difference		3.4	0.3		3.2	3.0
<b>Africa</b>						
Cameroon	1972–86	8.2	1.3	1.1	5.9	11.6
	1994–2001	4.6	0.1	1.2	3.3	19.0
Egypt	1960–75	4.8	1.4	1.1	2.4	4.0
	1975–2001	5.8	1.8	1.3	2.6	5.4
Morocco	1966–71	6.8	1.8	1.4	3.6	6.1
South Africa	1960–74	6.1	1.1	1.2	3.8	6.4
Median (high-growth periods)		5.9	1.3	1.2	3.4	6.2
Median (same countries, other periods)		1.7	0.8	1.2	–0.2	1.7
Difference		4.2	0.5		3.6	4.5
<b>Latin America/Caribbean</b>						
Argentina	1990–98	6.4	1.1	1.0	4.3	14.4
Brazil	1960–80	7.3	2.0	1.6	3.7	10.5
Chile	1975–81	6.9	0.8	1.2	4.9	11.1
	1983–98	7.4	1.9	1.2	4.3	8.4
Colombia	1960–80	5.4	1.2	1.4	2.8	5.2
	1985–95	4.5	1.1	1.7	1.8	6.8
Costa Rica	1961–79	6.5	1.3	2.0	3.2	8.1
	1983–99	5.1	1.2	1.6	2.3	11.4
Ecuador	1969–81	8.4	1.8	1.4	5.2	13.5
Guatemala	1960–80	5.6	0.8	1.4	3.4	7.7
El Salvador	1964–68	4.9	1.0	1.7	2.2	6.0
	1989–95	6.0	1.4	1.4	3.1	13.3
Honduras	1961–68	6.0	1.4	1.4	3.1	13.3
	1977–79	8.9	1.7	1.8	5.4	14.3
Jamaica	1965–72	6.7	2.6	0.6	3.4	4.5
Mexico	1960–81	6.8	1.4	1.8	3.7	9.0
	1995–2000	5.4	1.1	1.2	3.1	17.9

**Table 6. High-Growth Episodes, 1960–2001**

	Time Period	Average GDP Growth (%)	Average Capital Cont. (%)	Average Labor Cont. (%)	Average Real Cost Red.	Average Export Growth (%)
<b>Latin America/Caribbean</b> (continued)						
Nicaragua	1960–77	6.3	1.0	1.7	3.6	9.6
Paraguay	1960–81	6.7	1.3	1.5	3.9	7.5
Peru	1960–74	5.3	0.7	1.3	3.4	5.3
	1992–97	7.1	1.5	1.5	4.0	12.9
Uruguay	1974–80	4.8	1.7	0.3	2.8	7.1
	1990–98	4.4	0.9	0.6	2.9	9.4
Venezuela	1960–65	6.2	0.7	1.6	3.9	0.4
Median (high-growth periods)		6.2	1.2	1.4	3.4	9.2
Median (same countries, other periods)		1.5	0.8	1.5	–0.4	4.4
Difference		4.7	0.4	–0.1	3.8	4.8

Note: Some addition inconsistencies are due to rounding.  
Source: *International Financial Statistics*; for further details see appendix I

results for the Asian Tigers, other Asian countries, and OECD countries, while the lower panel does the same for the Latin American/Caribbean and African countries. In each panel, high-growth episodes are arrayed in descending order of the GDP growth rate of the episode. Each episode is then divided into components due to RCR (dark blue), capital contribution (grey), and labor contribution (light blue). It is easy to see that the dominant growth component is RCR, and the smallest and least variable component is the labor contribution to growth.<sup>32</sup>

<sup>32</sup> Our methodology, measuring the labor contribution by  $s_L(\Delta L/L)$ , implicitly maintains constant the quality of labor. Hence, any growth due to improved labor quality is incorporated in the RCR term. As noted earlier, however, this term is unlikely to contribute more than 0.25–0.5 percent per year to the growth rate; thus, shifting it out of the RCR term and into the labor contribution will not seriously affect our conclusions.

The importance of the capital contribution typically lies between that of real cost reduction and that of the labor contribution (figure 2 and table 6). In only two cases, Japan and Norway, is capital contribution more important than RCR. It reaches 2 percent per year in only about a third of the cases, highly concentrated among the Asian Tigers.<sup>33</sup> What emerges from these and many

<sup>33</sup> Once again our methodology creates a certain relationship between the growth assigned to RCR and that assigned to capital contribution. By our method of calculation, if we assign a higher rate of return to capital, this will automatically mean a higher capital contribution and a lower rate of RCR. This part, in the final analysis, is simply arithmetic. The point of these (and many other) exercises is that despite the built-in arithmetical relationship that says, basically, a positive error in capital contribution will automatically be reflected in a negative error in the calculated RCR term—the actual data show a positive relationship between the capital contribution and RCR.

other exercises is the positive relationship between capital contribution and real cost reduction. For example, 13 of the episodes in figure 1 (and table 6) have average capital contributions of at least 2 percent per year. The median capital contribution for these episodes is 2.5 percent, while the median RCR is 4.4 percent. Across the entire sample, the median capital contribution is 1.2 percent, while the median RCR term is 2.0 percent. When we get to the low-growth episodes shown in table 7, the median capital contribution is 0.4 percent, while the median RCR is –3.5 percent per year.

I cannot emphasize strongly enough that *the economics of the growth process is what produces these results*. Favorable opportunities for RCR increase the profitability of investments and incentives to invest. Weak opportunities for real cost reduction mean weaker efforts to invest.

Figure 3 focuses on the differences in growth rates between high-growth episodes and other periods for the same country rather than on the components of the observed growth rates.<sup>34,35</sup> We've learned two things:

- RCR is a large factor in accounting for the levels of growth rates that are shown in figure 2.
- RCR is an even more dominant factor in accounting for differences in growth rates between high-growth episodes and other periods, as demonstrated in figure 3.

Figure 4 follows the same format as figure 3, but the comparisons are between high- and low-growth (< 1 percent per year) episodes. Once again, RCR is the

dominant factor in differences in growth experiences.

### More on Export: Growth

Figure 5 depicts the excess of export growth over GDP growth in 59 high-growth episodes in 41 countries. One can see very clearly how GDP grew faster than exports in only 10 episodes. Exports in figure 5 are measured in “real dollars,” and thus there is no bias attributable to the general rise of dollar prices over this period.<sup>36</sup>

The ratio of goods and services exports to GDP—another measure of exports—is presented in separate panels of tables 10–50 (appendix 2). This figure is given for the beginning and end of

each high-growth episode.<sup>37</sup> Only 15 of the 59 high-growth episodes surveyed for this paper show a ratio of exports to GDP lower at the end of the episode than at the beginning, and for most the drop was very small.

### Project Evaluation as a Development Policy

The recent trend toward liberalization and modernization in the economic policies of developing countries has been very positive. We have seen this in the opening of their economies (reducing tariffs and import barriers, freeing the international flow of capital), the rationalization of their tax systems (broadening the base of taxation, lowering the highest rates, greatly improving tax administration), and the elimination of much waste and inefficiency in public enterprises (often involving their total or partial privatization).

In contrast to this very positive trend is an extremely important area in which very little progress has been made: bringing criteria of economic efficiency systematically to bear on the spending policies and programs of governments. If there is a single major economic policy challenge facing governments across the world, it is this. What makes reform in this area so difficult are the constant temptations to which governments and legislatures succumb: politi-

<sup>34</sup> Since each comparison in figure 3 is between two types of experience for the same country, we avoid the pitfalls that plague many cross-country comparisons.

<sup>35</sup> The high-growth periods are listed in table 6, and the low-growth episodes are those appearing in table 7. “Other” periods cover all years of observations (for the listed countries) that fell neither into high- nor low-growth episodes. All underlying data can be found in tables 10–50 (appendix 2). The height of a bar in figure 3 represents the difference in growth rates between a country's high-growth episodes and its other growth periods, provided all components of growth were greater in the high-growth episode than in the other periods. There are a few cases, however, where the labor and/or capital contribution to growth in the other periods exceed that same contribution during the high-growth episodes. Those cases are depicted by extending a country's bar below the 0 percent line. Thus, a case where the high-growth period reflected RCR of 4 percent, capital contribution of 2 percent, and labor contribution of 0.5 percent; and the “other” period reflected RCR of 2 percent, capital contribution of 1 percent, and labor contribution of 1.5 percent would have a bar of 3 percentage points in the positive zone and a bar of 1 percentage point in the negative zone. The total difference in growth rates would in this case be 2 percent (the differences between the positive and negative bars). Figure 3's bars are ordered according to the difference in growth rates.

<sup>36</sup> In deflating each country's dollar value of goods and services exports, we did not use a standard price index from the United States. Rather we sought a general index of the prices of tradables expressed in dollars. As wholesale and producer price indexes cover mainly tradable items, we used such indexes from five major countries. The wholesale price index of Japan was then turned into an index of dollar prices by multiplying it by an index of dollar per yen exchange rates. Similarly the wholesale price index of the United Kingdom was multiplied by an index of the dollar per pound exchange rates, etc. The countries from which this information was extracted were those whose currencies are used by the IMF to conform its own monetary unit, the SDR (special drawing rights), and the weights attaching to each of the constituent currencies were those employed by the IMF in its definition of the SDR. The resulting dollar price index is labeled the SDR-WPI. Its values from 1960 to 2002 are presented in table A45, together with a more detailed account of its derivation. We emphasize that our results in no way depend on the choice of the U.S. dollar as the unit in which exports are measured. The value we get for exports in real dollars would not change if we shifted to a real yen basis, for then we would simply multiply the dollar value of exports by a yen per dollar exchange rate, and we would simultaneously adjust the deflating SDR-WPI index by multiplying it by an index of the yen per dollar rate. The growth rates of real exports, as measured here and reflected in figure 4, would remain unchanged.

<sup>37</sup> This measure is fundamentally “domestic” in its focus, and can easily go down, while over the same period the growth rate of exports measured in real dollars exceeds that of GDP. It turns out, however, that this domestically oriented measure leads to the same general conclusion as our real dollar measure of exports.

**Table 7. Low-Growth Episodes, 1960–2001**

	Time Period	Average GDP Growth (%)	Average Capital Cont. (%)	Average Labor Cont. (%)	Average Real Cost Red. (%)	Average Export Growth (%)
Greece	1979–87	0.0	0.5	0.5	-1.0	3.8
Japan	1990–01	1.2	4.6	0.4	-3.8	3.6
New Zealand	1974–80	-0.8	0.4	0.7	-1.8	4.7
	1986–92	0.1	0.7	1.1	-1.7	3.9
Cameroon	1986–94	-3.8	-0.3	1.4	-4.8	-11.0
Guatemala	1980–86	-0.9	0.1	1.3	-2.4	0.1
El Salvador	1978–86	-3.6	0.0	1.0	-4.6	-0.6
Jamaica	1972–85	-1.9	0.0	1.4	-3.3	-1.0
	1995–2000	-0.6	1.3	0.6	-2.5	5.0
Nicaragua	1977–93	-2.6	0.3	1.8	-4.7	n/a
Peru	1987–92	-4.8	0.5	1.4	-6.7	-2.2
Venezuela	1979–85	-1.5	0.4	1.8	-3.8	-1.6
Median (low-growth periods)		-1.2	0.4	1.2	-3.5	0.1
Median (high-growth periods for countries listed above)		6.1	1.1	1.3	3.4	8.6
Difference in medians (C – B)		7.3	0.7	0.1	6.9	8.5

Source: *International Financial Statistics*; for further details see appendix I

cal pressure and lack of serious technical analysis. In many legislatures, there are traditions whereby groups of legislators support each others' favorite projects. Each legislator represents constituencies that are very likely to benefit from the projects they favor but that very often pay only a fraction of the costs. Sometimes outright corruption enters, with legislators and members of government actually receiving bribes from the private beneficiaries of contracts or new laws.

I have personally witnessed ministers and chief executives almost "creating" projects, simply to have something to announce when making a visit to a city or region. Many government employees all over the world have experienced

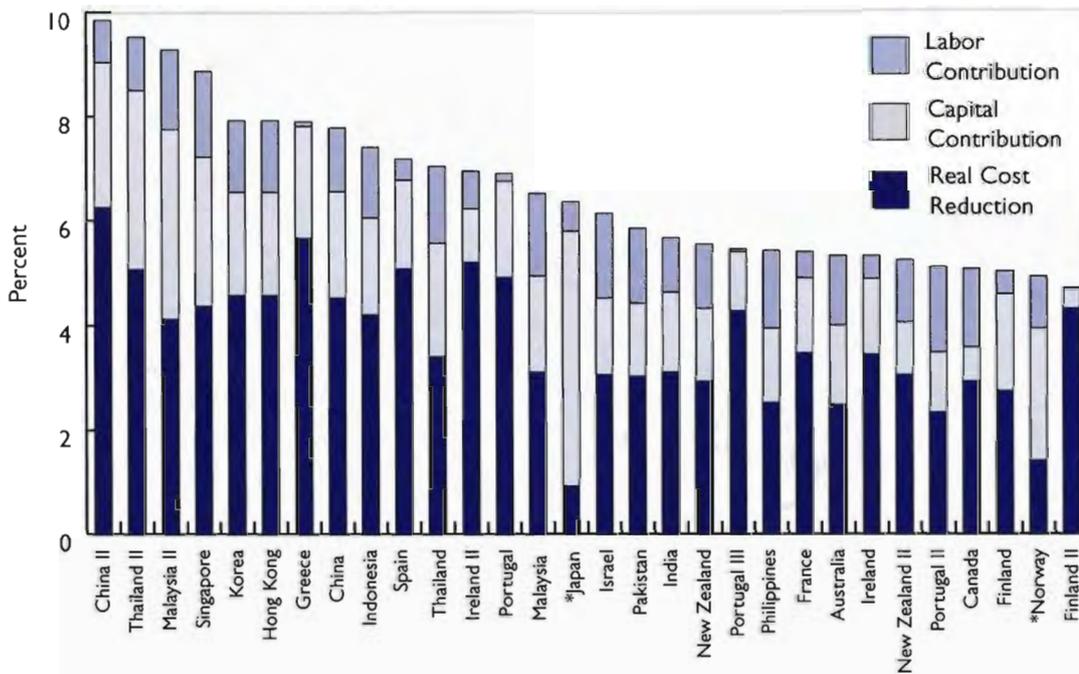
the tumult that follows an important minister's announcement of a new law or program: the bureaucracy then tries on Monday morning to create the program or law the minister mentioned on Saturday night. The lucky cases are when the minister was not very specific; the most troublesome are those in which the promises were made in excruciating detail.

The overriding challenge is to find ways to make the general welfare the foremost criterion for laws and regulations and for government projects and programs. Procedures must be instituted to protect taxpayers from having their money spent on projects that are overall very wasteful but end up serving the whims

and caprices of powerful politicians or the economic interests of favored segments of society to the detriment of the whole. Cost-benefit analysis is needed to make plain *how the total cost of a project relates to its total benefit*.

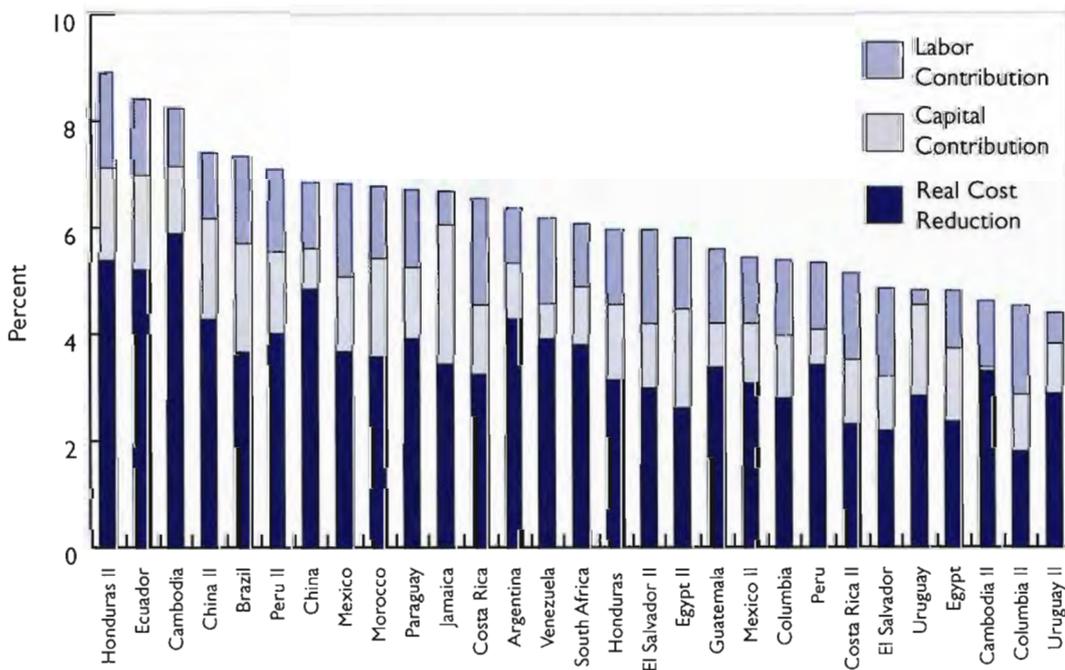
The basic problem is one of highly concentrated benefits and widely dispersed costs. An irrigation or highway or bridge project may cost a billion dollars and have benefits of only half that amount, yet the people in the area where the project is constructed will tend to view it as a wonderful thing. After all, they are getting nearly all the benefits, but paying (through their taxes) only a small fraction of the cost. It is their correct perception of a very large net benefit to

**Figure 2a. Components of Growth: High-Growth Episodes**  
(Asian Tigers, Other Asian, OECD, 1960–2001)

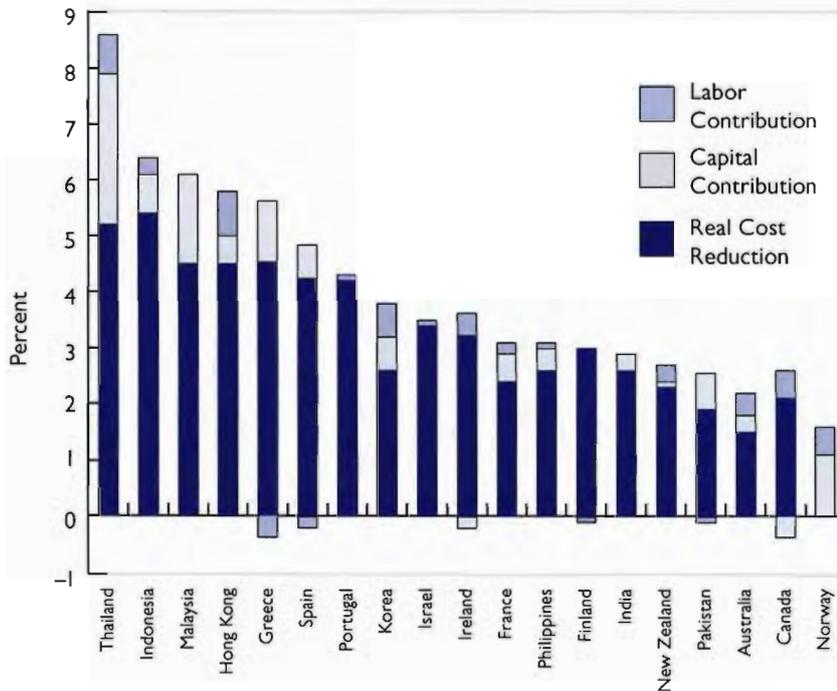


\*Japan and Norway are the only cases where the capital contribution is more important than the contribution of real cost reduction.

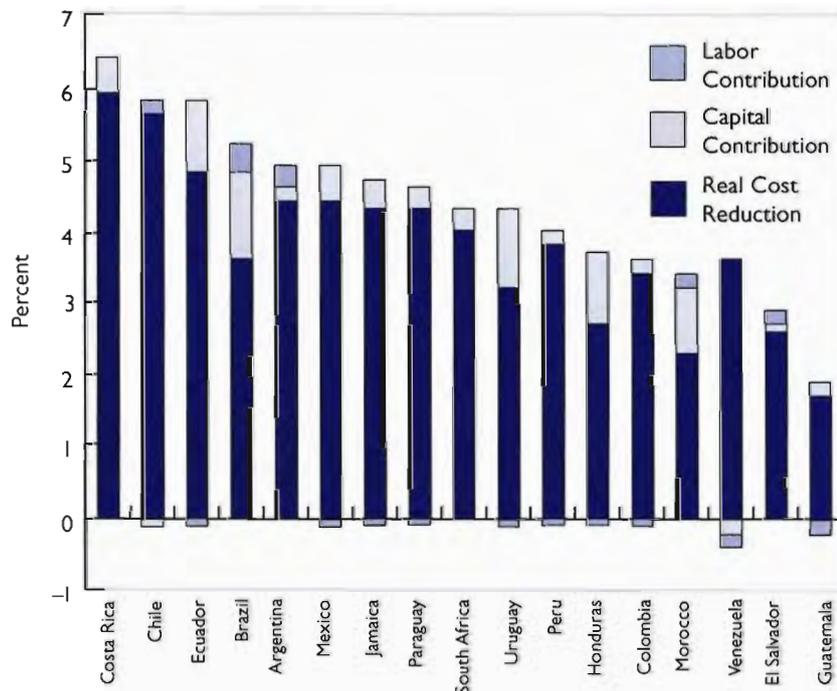
**Figure 2b. Components of Growth: High-Growth Episodes**  
(Latin America, Caribbean, Africa, 1960–2001)



**Figure 3a. Growth Differences: High Growth vs. Other Episodes, Asian Tigers, Other Asian, OECD, 1960–2001**  
(Same Country, Different Periods)



**Figure 3b. Growth Differences: High Growth vs. Other Episodes, Latin America, Caribbean, Africa, 1960–2001**  
(Same Country, Different Periods)



them that stimulates a strong political pressure to do the project. This gives one a capsule picture of how even very uneconomic projects can manage to become important parts of such expenditures.

The branch of economics called “applied welfare economics” is well established, going back more than 200 years. It represents a very serious effort to quantify the benefits and costs of policies, projects, and programs from the standpoint of the economy or society as a whole. It also has the capacity to estimate how benefits and costs are broken down among different subpopulations to determine which groups or categories of people are the main beneficiaries of a project or program, and which, if any, are its net losers. Modern cost-benefit analysis is simply applied welfare economics as it deals with investment projects and government policies. The implementation of cost-benefit analysis at the project level probably dates from the 1920s, but experienced its major development in the 1960s. By now there is a large literature on the subject and a vast array of studies evaluating specific projects.

The task at hand for most countries is to formally integrate economic cost-benefit analysis into their procedures for deciding which projects will be undertaken, and when. This task entails

- establishing administrative mechanisms by which projects will be appraised and reviewed
- establishing technical standards, norms, and procedures to follow in the evaluation

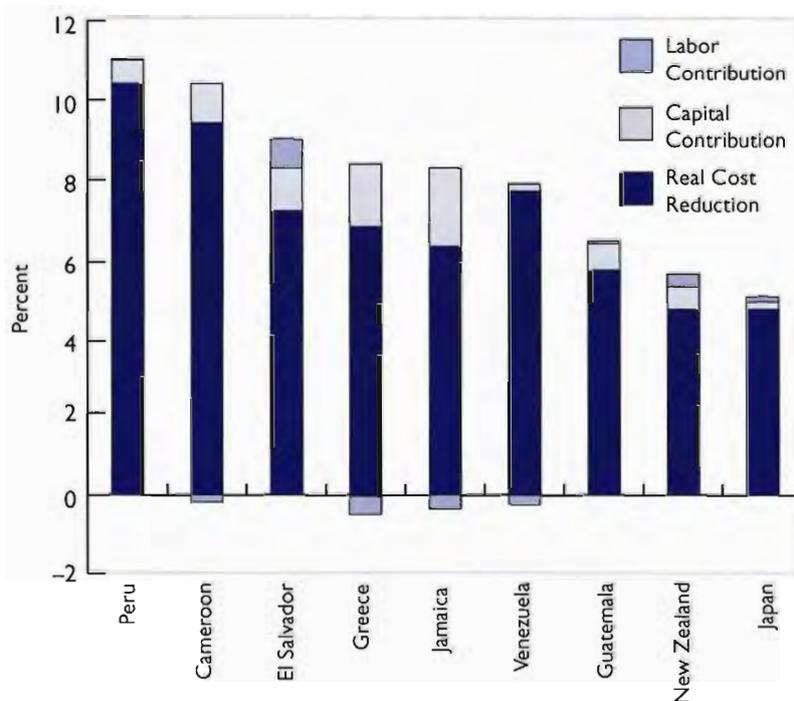
- developing technical staff capable of carrying forward the analysis

This is a daunting task: in addition to creating the technical capacity to accomplish it, there will be resistance to its implementation from the centers of power and interest groups whose interests are threatened. Indeed, common sense tells us—and experience has shown—that noneconomic considerations (mainly political) will always play a significant role in the choice of projects and programs. What can be done is to see to it that, in the main, political choices are made from a set of “good” or “pretty good” projects, and that gross mistakes (such as those that have led in the past to huge losses or costly white elephants) will be eliminated.

To achieve this goal, countries should seek to institute a standardized process of project preparation, evaluation, and review. Ideally, all projects should be scrutinized in the same light, but that is not easy to achieve. The proximate goal should be for the national government to have a clear-cut, rigorous set of procedures and standards, while maintaining a serious campaign to institute similar evaluation processes for projects financed by provinces and municipalities.

It is extremely important to have a team of the highest quality in charge at the birth of a national project evaluation program. Ideally, everybody concerned, from the top level down, should be fully aware of the nature and magnitude of the challenge as well as of the risks. The purpose of the program can be completely defeated simply by putting the wrong people in charge at the outset.

**Figure 4. Growth Differences: High Growth vs. Low Growth Episodes: 1960–2001 (Same Country, Different Periods)**



There is a huge difference between “real” and “comfortable” project evaluation: the comfortable kind simply goes through the motions but ends up approving, perhaps with a few modifications, the projects that are traditionally thrown up by the political process.

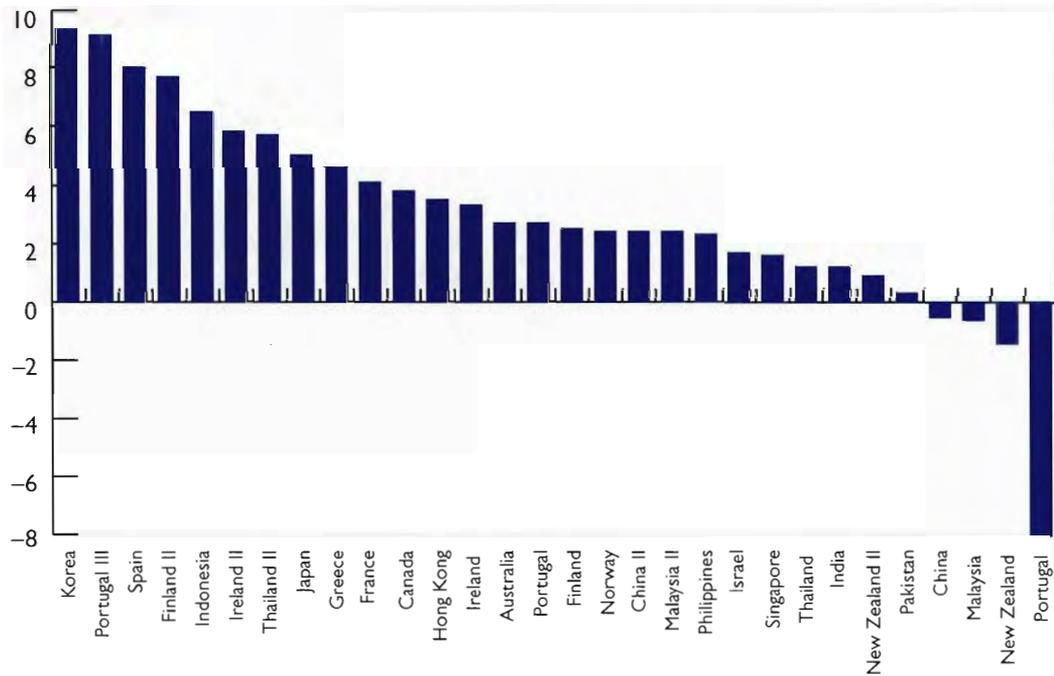
One must not forget that the real purpose of the evaluation enterprise is to influence decisions for the better. If all parties in the struggle for funds are satisfied with the program, i.e., if there are no big fights and loud complaints, it is an almost certain signal that the program has failed. By the same token, all participants in the new enterprise should realize how important it is to be well prepared for each battle. Nothing could be worse for an incipient program than to enter a struggle against powerful, well-entrenched forces and end up

disgraced for having a poorly founded or badly analyzed case. The best scenario, on the other hand, is not one in which the new project evaluation agency assumes the attitude of a boxing champion challenging all comers to a fight. Far better is the scenario in which the project agency instills great respect for its expertise and finds ways to be helpful to the government’s various operating agencies, even from the very first steps in the development and preparation of new projects.

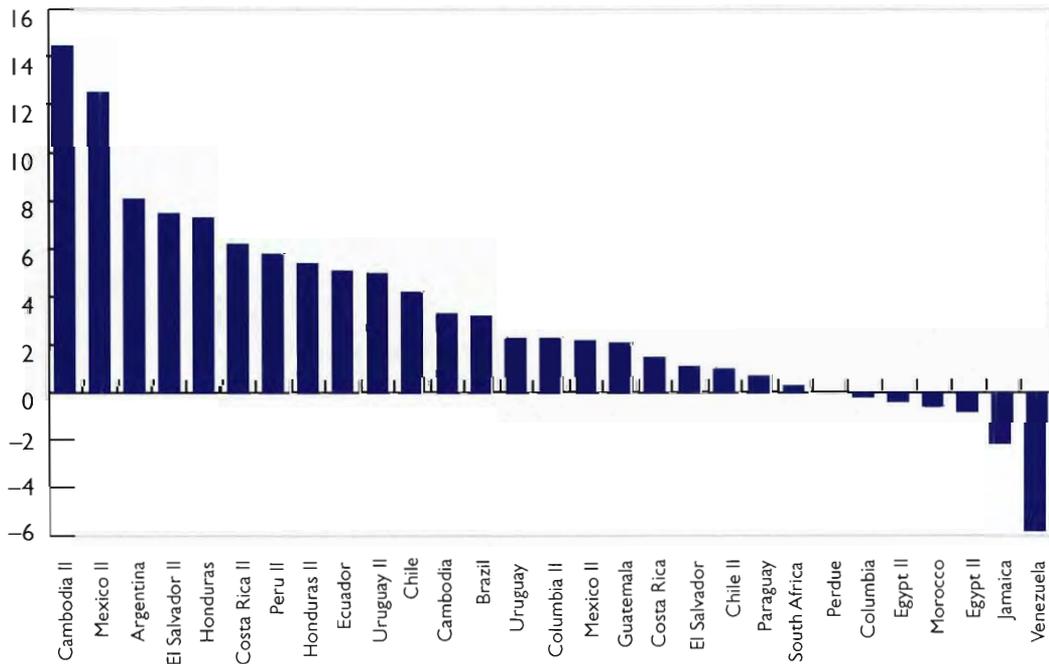
### Economic Growth and Poverty Relief

Far too often, policies designed to facilitate economic growth have been depicted as diverting public resources and energies away from the objective of alleviating poverty. Such

**Figure 5a. Excess of Export Growth over GDP Growth: High-Growth Episodes, 1960–2001**  
(Asian Tigers, Other Asian, OECD)



**Figure 5b. Excess of Export Growth over GDP Growth: High-Growth Episodes, 1960–2001**  
(Latin America, Caribbean, Africa)



characterizations create a false dichotomy: economic growth is in no sense an enemy of poverty. Quite the contrary, economic growth is probably the strongest and most reliable force causing the fraction of the population afflicted by poverty to shrink over time. No one has worked harder to marshal the evidence in this regard than David Dollar. Working mainly in collaboration with Aart Kraay, Dollar has produced a series of papers exploring the relationship between poverty and growth. Their most fundamental insight is that when the per capita income of a country rises, that of the poorest quintile rises with it, perhaps even a little bit faster. The evidence they offer is from a cross-section of 137 countries having at least one observation on income accruing to the bottom quintile. When these data are plotted against per capita income of the country as a whole (in logarithms), the correlation is extremely high.<sup>38</sup> The regression indicates that a 10 percent improvement in overall average income tends to be associated with a 10.7 percent improvement in the average income of the poorest fifth.<sup>39</sup>

One can rightly argue, however, that such cross-country relationships reflect many factors—e.g., geographical, cultural, industrial—that are beyond the capacity of a typical developing country to influence. Hence I find more persuasive the results of another Dollar-Kraay regression, in which each observation represents the percentage change in the

average income of the poorest quintile plotted against the percentage change in the per capita income of the country as a whole over the same time span.<sup>40</sup> In this regression a 10 percent change in average income is linked to a change of almost 12 percent in average income of the lowest quintile; the slope of this regression shows an even higher absorption of poverty than the cross-country regression.

Sometimes, too much weight is placed on regressions and correlations. The fact that the income of the poor rises proportionately with overall per capita income in one country does not guarantee a similar relationship in another country. In this light, it is more interesting to look at Dollar and Kraay's specific cases. Here the evidence is very clear as well: in nearly all cases, income of the poor moved in the same direction as overall income. Only in about 10 percent of cases did income of the poor go down while overall per capita income went up, or income of the poor go up while overall income went down.<sup>41</sup> The great bulk of the observations reflect positive growth for overall income and for the lowest quintile, and among these the income of the poor rose faster than overall income in more than half the cases.

Dollar and Kraay (2002a, 218–19) also explore the impact of specific types of policies upon the incomes of the poor. Their broad conclusion is that policies

that work through economic growth are the ones whose positive impact in reducing poverty is most clearly evident:

Average incomes of the poorest fifth of a country on average rise or fall at the same rate as average incomes [of the total population]. This is a consequence of the strong empirical regularity that the share of income of the poorest fifth does not vary systematically with average incomes, in a large sample of countries spanning the past four decades. This relationship holds across regions and income levels, and in normal times as well as during crises. We also find that a variety of pro-growth macroeconomic policies, such as low inflation, moderate size of government, sound financial development, respect for the rule of law, and openness to international trade raise average incomes with little systematic effect on the distribution of income. This supports the view that a basic policy package of private property rights, fiscal discipline, macroeconomic stability, and openness to trade on average increases the income of the poor to the same extent that it increases the income of the other households in society. It is worth emphasizing that our evidence does not suggest a “trickle-down” process or sequencing in which the rich get richer first and eventually benefits trickle down to the poor. The evidence, to the contrary, is that private property rights, stability, and openness contemporaneously create a good environment for poor households—and everyone else—to increase their production and income.

<sup>38</sup>  $R^2 = 0.88$ . See figure 1, Dollar and Kraay (2002a, 197).

<sup>39</sup> The slope of the regression line is 1.07.

<sup>40</sup> Here the correlation is also significant ( $R^2 = 0.49$  for 269 observations). This relationship is graphed on the lower panel of figure 1 in Dollar and Kraay (2002a, 197).

<sup>41</sup> See figure 1, Dollar and Kraay (2002a, 197).

## Conclusion

**B**y this point, it should be very clear that this paper does not offer easy solutions to those interested in fostering economic growth in developing countries. Our prescription is more like the doctor's orders to follow a healthy diet and get plenty of rest and exercise to build resistance to disease and infection, promote growth or strength, and increase longevity. The doctor's advice is based on a deep understanding of physiological processes. Medical practitioners know, however, that doing everything right does not guarantee you will live to age 60, let alone 90—but they know what you should do to make a long and healthy life more likely. The story is quite similar with respect to promoting economic growth. A nation's economy tends to develop better, and has greater resistance to shocks and vicissitudes, if it follows policies that foster economic efficiency and give scope to the forces of growth. Pursuing such policies is not likely to generate a growth miracle, but it is virtually certain to improve a country's growth prospects.

If there is a single key to distinguishing among good, mediocre, and bad policies, it is the principle of weighing the likely benefits of a policy against its likely costs (see appendix 1, "Project Evaluation and GDP Growth"). This may appear too obvious, or even unnecessary, to articulate. Do not all, or at least most, governments routinely do this? Unfortunately, they do not. Modern societies are incredibly complex, and there are all sorts of elements that stand in the way of the simple pursuit of the general welfare. It is not easy for a society to depart

from traditional ways of doing things, or to abandon outmoded institutions or construct new ones. When actions are taken that ostensibly promote the general welfare, it is not easy to prevent their being coopted by particular groups to the detriment of society as a whole. Indeed, it is often not easy to prevent powerful groups from gaining preferential treatment, even without the patina of ostensibly promoting the general interest. Then there is the unpleasant truth that almost any policy change hurts some segments of the population, so even good policy moves have to cope with opposition from these quarters. The dream of economists has been that with good policy moves whose benefits are greater than their costs, one could compensate the losers and still have benefits left over. However, this dream cannot generally be achieved. In reality, it is too hard to identify the potential losers, quantify their likely losses, and avoid false claimants pressing for a share of the compensation. Thus, in broad terms and with only a few exceptions, one has to live with the fact that there will be losers from most real world policy changes—even good ones. The hope—and I believe it is justified—is that when good policies are the general rule, the losers from one policy will end up gaining from a number of others, and thus few will be net long-term losers.

The list of potential reforms makes for quite a long road, and there are many countries that still have a long way to go. Liberalizing trade to build an economy based on a nation's true comparative advantage; modernizing the justice system to eliminate interminable

delays, stamp out corruption, and incorporate sensible economic principles; securing property rights at all levels of society; building a strong and modern education system; and providing basic public health facilities, especially in low-income areas: all are important steps on the road to modernization. So too is the creation of a policy framework—a set of established rules and procedures—within which economic activities can freely function and market adaptations and adjustments can freely take place. Included in this are sound macroeconomic policies; a well-functioning banking and monetary system; a police system that holds criminality in check; and a system of laws and regulations that enables companies to be born without a struggle, collect debts that are owed them, adapt to new challenges, and, in the worst cases, be liquidated via a competent, quick, and efficient bankruptcy process.

In judging these policies and reforms, the guiding principle should be weighing benefits against costs. The techniques of applied welfare economics constitute the main tools for this assessment. They can be used to study tax policy, trade liberalization, educational design, industrial organization—virtually any legal, regulatory, or institutional change.

This paper has emphasized the need to apply sound cost-benefit analysis to public investments and to other public expenditure decisions. This is important for the following reasons:

- We have in the past done a better job of general policy reform (trade and

tax policies, monetary institutions, etc.) than we have of specific outlays.

- It is almost impossible to deal in a general fashion with most specific outlays (each road and dam is a separate entity and can be a good or bad investment for society).
- The specific beneficiaries of each project typically form a very strong pressure group in the project's favor, even when its costs far outweigh its benefits (an anomaly that is explained by the fact that those beneficiaries usually pay only a small fraction of the costs but get the lion's share of the benefits).

The big problem in instituting a system of careful cost-benefit analysis of public outlays lies in the need to have a large cadre of trained people to do the job. It is a major task to train such a group, but beyond that, a country's leaders need to have the political will to implement a proper evaluation procedure. Still, the reward from successful implementation of such a system can be very substantial. Indeed, this is one of the few places where a successful policy reform can have a permanent effect on a country's growth rate: through raising the economic yield of public investments, the reform automatically enhances the growth impact of each year's public investment budget.

Most policy improvements also affect growth, but typically only over a transition period. This is because their main effect is typically on the efficiency level of the economy. When a policy change takes a country from 85 percent to 90 percent efficiency, the gain is an extra five percentage points forever, but the

growth impact is concentrated in the years during which the transition from 85 percent to 90 percent occurs. Policy reforms can impact growth over a very substantial period of time, but for this to happen, there will generally have to be a series of successive reforms, each one doing its bit (over its transition period) to raise the time path of the country's output.

But what happens when all, or nearly all, needed policy reforms have taken place? What then is the effect of policy on growth? The answer is that in those circumstances the task of policy is to provide the framework—the environment—in which the forces of economic growth can have free rein. These forces are

- adding to the labor force
- increasing (and maintaining) the average quality of the labor force
- adding (via net investment) to the capital stock of the country
- achieving a high real rate of economic return as a consequence of that investment
- generating real cost reductions as efficiently and rapidly as the society can manage

On the whole, government policy does not directly affect these forces of growth, except in the educational field, but even here there is a long lag between the actual investment in schooling and its ultimate impact on economic productivity. Yet in the other direction, government policy can certainly create situations in which investment is unattractive and productivity is stunted. Policy can also

place many obstacles and impose many delays in the path of individuals and firms as they strive to reduce real costs. The big achievements that still wait to be accomplished are those of clearing the path for these forces of growth to work their wonders. We must never forget that the underlying forces of growth arise from the efforts, energies, and ingenuity of a country's people. One of the greatest tasks of policy is to unleash these forces. To emphasize this point, let me recall that in every comparison that we made between periods of successful growth and other periods, the element of real cost reduction accounted for the largest share of the difference. This force can be thought of as human ingenuity at work—human energies channeled to get more out of society's resources. This desire comes quite naturally to people. The task of government is to create the framework, the environment in which these natural forces can work to their fullest in bettering the life of a society.



# Appendix I. Notes

## The Capital Contribution to Growth

We have seen that the capital contribution to a country's growth rate can be expressed as that country's net investment as a fraction of GDP multiplied by the gross-of-depreciation rate of

return on that investment. This approach can be used at an aggregate level, but it may also be applied in a disaggregated way, breaking up total investment into as many parts as one finds convenient. We can thus determine the contributions to growth resulting from different categories of investment, as shown in table 8.

**Table 8. Breakdown of the Capital Contribution to Growth**

	Amount of Net Investment	Gross of Depreciation Rate of Return %	Contribution to Growth
Corporate Investment	800	20	160
Noncorporate Investment	400	15	60
Housing Investment	1,000	6	60
Public Infrastructure Investment	1,000	4	40
Total Net Investment	3,200	10	320

If GDP is 20,000, the capital contribution to the growth rate would be 1.6 percentage points, representing a rate of net investment of 16 percent ( $3,200/20,000$ ) times a weighted average gross-of-depreciation rate of return of 10 percent. This capital contribution could be further broken down into 0.8 percent from corporate investment, 0.3 percent from noncorporate investment, 0.3 percent from housing investment, and 0.2 percent from public infrastructure investments.

Quite intentionally, I assigned different rates of return to different sectors in this example. The return to capital in a public sector electricity or water supply project would definitely be captured, but the return to capital invested in the nation's public buildings and road network would typically be neither directly counted nor imputed. This is why a low (4 percent) rate of return is assigned to public infrastructure investments in table 8. This rate is not intended to reflect the actual economic rate of productivity of such investments. Table 8 aims instead to capture just that part of the return represented by public sector receipts from infrastructure activities like public utilities, as those receipts are measured in the national accounts.

This discussion of infrastructure has an important bearing on the analysis of economic growth, most notably on how we interpret the results of a breakdown of growth into its components. The standard calculation of the capital contribution to growth is based on the full net increment to the capital stock. It is expressed here as  $(\rho + \delta)(\Delta K/y)$ , where  $\rho$  is the net rate of return attributed to

investment, and  $\delta$  is the depreciation rate assumed to apply;  $\Delta K$  is the net increase in the capital stock (measured in GDP baskets), and  $y$  is the level of real GDP. Alternatively, the capital contribution can be measured as the share of capital  $s_k$  multiplied by the rate of growth of the real capital stock ( $\Delta K/K$ ). It is easy to see that the two approaches become one if  $(\rho + \delta)$  is taken from the observed share of capital in the GDP, since then  $s_k = (\rho + \delta)K/y$ .

The important point is that  $\Delta K$ , the net increment to the capital stock, typically includes both public and private sector investment. In table 8, the gross rate of return to corporate investment is 20 percent; to business investment (corporate plus noncorporate), the return is 18.3 percent ( $220/1,200$ ); to "private" investment, including housing, the return is 12.7 percent ( $280/2,200$ ). Yet the rate of return one should apply to  $\Delta K$  to arrive at the capital contribution to growth is only 10 percent. Whatever the aggregate rate of return used (or implicit in the use of  $s_k$  in a growth accounting analysis), a much higher rate of return to private investment is implied, because the overall average also includes a much lower (here 4 percent) rate of return on public investment.

These figures refer to net rather than gross investment. Thus, the data in table 8 could have come from gross corporate investment of 1,500 with depreciation of 700, gross noncorporate investment of 700 with depreciation of 300, gross housing investment of 1,800 with depreciation of 800, or gross infrastructure investment of 1,400 with depreciation of 400.

The exercises in growth analysis presented in this paper are summarized in tables 10–50 and assume that the net-of-depreciation, gross-of-tax rate of return over the economy as a whole is 10 percent, and that the average depreciation rate applicable to new investment is 5 percent per year. As a further check on the reasonableness of our simple example, we note it would take a capital stock of 44,000 to produce a total depreciation figure of 2,200 (at a 5 percent rate). This in turn implies that reproducible capital (i.e., not counting land), would represent 220 percent of a year's GDP, yielding a quite reasonable ratio of reproducible capital to output of 2.2.

## Project Evaluation and GDP Growth

At the very core of cost-benefit analysis—indeed, probably at the very core of the entire discipline of economics—is the idea of *efficiency*. One wants to maximize the benefits obtained for a given cost or set of resources. Except for special cases (related to the fact that our national accounting measures of GDP give only approximate measures of society's welfare), one can say that any operation that is economically worthwhile (generating benefits greater than costs) will cause GDP to be higher than it otherwise would be. When one thinks of an operation or a project whose flows of benefits and costs are spread out over time, it follows that the new trajectory of GDP (with the project) will be higher than the one that would prevail in the project's absence.

It is important to note that a project does not have to have a big effect on GDP to be worthwhile. If the funds used generated, on average, a real rate of return of 10 percent in their alternative use, then the project is borderline acceptable if its use of those same funds also yields a 10 percent real return. A really great project would, under these circumstances, produce a real return of 20–25 percent. A really bad project would generate zero or negative real rates of return.

Few, if any countries could uncover a huge inventory of unexploited projects that could produce real returns of 20–25 percent. Some such projects could surely be found in almost any country, but not enough to permit us to say that the typical “good” project is in that category. It is much more likely that most countries are actually investing significant amounts of public resources in projects whose economic rate of return is lower than the economic cost of capital. In these cases, the trajectory of the country’s GDP would be higher without the project than with it. Detecting and eliminating such projects, or better, replacing them with projects yielding more than the economic opportunity cost of capital, is the main route by which a good national system of project evaluation can raise a nation’s wellbeing.

To get an idea of the order of magnitude of such effects, let us start with an example of contemporaneous operations—i.e., those whose benefits and costs all accrue in the same period. For such projects, a swing from 80 percent to 90 percent efficiency would mean a gain in GDP equal to 10 percent of the

cost of the project. If the public expenditures in question amounted to 10 percent of the country’s GDP, this would increase that year’s GDP by 1 percent. If this same efficiency gain continued to operate year after year on a similar flow of public outlays, it would augment the country’s whole trajectory of GDP by the same 1 percent.

Now let us examine, in as simple a framework as possible, how an improved system of economic project evaluation of public sector investments might affect a country’s GDP growth rate. The key element in this examination will be the so-called capital contribution to a country’s GDP growth. This can be represented as  $\sum_j (\rho_j + \delta_j) \Delta K_j$ , where the  $\Delta K_j$  are the increments to capital of different types or in different sectors, and  $\rho_j$  and  $\delta_j$  are real rates of return (or productivity) and real rates of depreciation, respectively.<sup>42</sup>

When a country shifts to a better way of assessing projects, one can expect that both the amount of public investment ( $\Delta K_g$ ) and its rate of economic productivity ( $\rho_g$ ) will change. However, for simplicity we assume that new projects will yield precisely the society’s general economic opportunity cost of capital. By this assumption, we say that if we invest “more than before,” the extra capital will be diverted from society’s general uses and will thus generate here—as new public investment—the same rate of return as in its alternative

uses. Thus the gain to society is limited to the amount of funds that would otherwise be invested at below-normal yields. In the alternative case, where we invest “less than before” in public projects, the funds not occupied in the project will be shifted to their alternative uses in the private sector, where they can be expected to yield society’s general marginal rate of return.

Thus, if public investment previously represented 50 (out of a GDP of 1,000) and was yielding an average of 4 percent, and if from now on public investment will yield society’s general rate of return of 10 percent, the impact of this investment on growth will increase by  $(0.10 - 0.04)50$ , or 3. The GDP growth rate would accordingly increase by 0.003 percent (3/1,000).

Based on our assumptions, this calculation is valid independently of whether the rate of public investment goes from 50 to 60 or from 50 to 40. If the rate goes up, the extra funds are deemed to have come from alternative investments, which would anyway have yielded 10 percent (society’s general rate of return). And if it goes down, the extra funds are considered to have gone to new private investments with the same 10 percent yield.

So a quick indicator of the impact of an improved project evaluation framework on a country’s rate of growth is simply the percentage by which the actual economic rate of return to public investments falls short of society’s general real opportunity cost of capital, multiplied by the rate of public sector investment (as a fraction of GDP) that would likely

<sup>42</sup> The marginal product of capital is measured gross of depreciation, because GDP is defined that way and because market prices generally reflect depreciation as well as other costs.

prevail in the absence of the program. In this case it is  $(0.06)(0.05) = 0.003$ .

Such an impact on growth is not negligible. If we start out with a GDP of 1,000, growing at 3 percent per year, the present value of the future stream of GDP is  $1000/(0.10 - 0.03)$ , using a 10 percent rate of discount (as we should under the assumption that society's economic opportunity cost of capital is 10 percent). This is equal to 14,286. If we shift to the new scenario, the present value jumps to  $1000/(0.10 - 0.033) = 14,925$ , a gain of 639 or almost two-thirds of the current year's GDP.

A still more positive result is generated if it is assumed, as is quite plausible, that when the policy shift is made, the higher rate of productivity applies to the gross, rather than net, investments that are made under the new regime. The previous calculation might be thought of as representing a gross investment of 90 with depreciation of 40. The assumption implicit in the above example would be that the 40 that represented the replacement of "old" investments would still yield 4 percent, and that only the net increment to the capital stock would yield 10 percent. At the other extreme, we can assume that the entire gross investment of 90 generates a yield of 10 percent, and that the alternative would be this same investment yielding only 4 percent. In this case the immediate impact on growth would be  $0.06 \times 90$ , or 5.4 rather than 3.0. Its growth implication would be an initial impact of more than 0.5 percent rather than just 0.3 percent.

Readers should not try to make too much of the depreciation adjustment; first, because some fraction of the expenditure on public investment goes for assets that are nondepreciable; and second, because the gain to be obtained from this source is transitory (only at the start of a reform do all the investments being replaced fall in the low yield category). As time goes on, more and more of new gross investments (yielding 10 percent) will be replacing older ones that were also high yield. When this becomes the general rule, the impact on growth is once again based on the net (as distinct from gross) increment to the capital stock.

To get an idea of the possible order of magnitude of the gains to be achieved from a thoroughgoing program of public sector project evaluation, readers may refer to table 5 (page 13), which shows the fraction of GDP devoted to public sector investment in a number of developing countries.<sup>43</sup> With the above caveats in mind, the critical results of table 5 are that, for the developing countries considered there, the median ratio of gross public investment to GDP was 7.57 percent, while the first and third quartiles were 4.47 percent and 9.53 percent, respectively. The illustrative example presented above, showing

<sup>43</sup> Note that these data refer to gross investment. Net investment would be extremely difficult to obtain, because of uncertainties about how the national accounts of different countries deal with capital consumption allowances for those parts of the public sector capital stock that do not produce salable outputs.

infrastructure gross investment equal to 9 percent of GDP (net = 5 percent), is therefore well within the range of real-world observations, so far as the actual ratios of public investment to GDP are concerned. Unfortunately, it is not so easy to confront with reality our assumptions about actual real rates of productivity of public investments, and about how much they could plausibly be improved under a rigorous program of public sector project evaluation. Yet I feel quite confident that the figures used in the above example are within the reasonable range for a substantial set of developing countries.

I have earlier emphasized that most policy improvements have their main impact on the *level* rather than on the *rate of growth* of GDP. This is largely true for trade policies, education policies, and efficiency-improving reforms of all kinds. All these policies have their main effects in raising the time path of GDP by a few percentage points. Their impact on the growth rate is largely confined to the period in which the economy makes its transition from a lower to a higher level of efficiency.

An improved project evaluation program is different from these and many other important reforms in that it digs directly into the growth process itself by raising the productivity of net public investment. So long as the economy is on a growth path in which net public investment plays a continuing role, a program that significantly raises the rate of economic productivity of public investment will indeed have a permanent, continuing effect on the growth rate.

## Exploring Successful Growth Episodes

The figures in table 6 (pages 16–18) were derived from the basic data from the IMF's International Financial Statistics, which summarize the national accounts of member countries. Using these data we applied a single, consistent methodology to all except the smallest countries, Russia, and other transition countries. Output of a country was measured in GDP baskets. Investment was measured in the same units (i.e., deflated by the same index) so that a rate of return could meaningfully be applied. The labor contribution to growth was estimated by multiplying the percentage rate of growth of the country's employed labor force by the factor 0.5. This can be thought of as a rough estimate of labor's share in the country's GDP.<sup>44</sup>

The capital contribution is obtained by taking net investment (deflated by the GDP deflator) times an attributed gross-of-depreciation rate of return of 15 percent. This is thought of as representing a net rate of return of 10 percent plus a depreciation rate of 5 percent, but it can equally be thought of as any

<sup>44</sup> This is an admittedly rough approximation, but some such convention is necessary; otherwise, many countries would have to be excluded. Readers can see in table 6 that none of our conclusions would be affected if the factor 0.5 were changed to 0.6 or even 0.7, which probably exhausts the plausible range of labor's share. Readers should note that the great difficulty in ascertaining labor's share does not come from data on wages and salaries, which are usually readily available, but from getting information on the income of nonincorporated enterprises and of the self-employed, and from the need to split that income into two parts—one attributable to labor and the other to capital.

combination of the two that adds up to 15 percent. The above depreciation element applies to the contribution of new investment to current GDP. Depreciation once again enters the picture, however, as an offset to each period's gross investment. This offset represents the depreciation of investments made in prior years. This is typically obtained by developing estimates of the country's total stock of reproducible capital and applying an assumed depreciation rate. We here use a different procedure, again designed to extend our coverage to a greater number of countries. Our depreciation offset is obtained by taking 5 percent of the gross investment of each of the past 10 years, plus 1.5 percent of the gross investment of each of the past 20 years.<sup>45</sup>

<sup>45</sup> This can be thought of applying a 10 percent depreciation rate to each year's investment in machinery and equipment, and a 3 percent depreciation rate to each year's investment in buildings, with half of each year's investment in each of these two broad categories. If these assumptions are made, some 40 percent of investment in buildings is thought of as representing a permanent addition to the capital stock. One motivation for cutting off the process at 20 years is the difficulty of getting the necessary data on investment. Indeed, there were a number of cases where investment had to be estimated by indirect means. For such periods, the assumption was made that the ratio of investment to GDP in the "unknown" period was equal to the average of that ratio for the closest 10-year period for which the necessary data were available. This procedure works so long as data on GDP are available for each of the relevant years. It also avoids the necessity of assuming an initial capital stock, which is necessary when capital stock series are developed using a perpetual inventory approach. It may also have a slight advantage vis-à-vis methods that assume exponential depreciation in that the latter methods imply a concentration of economic depreciation in the early years of an asset's life. Our main reason for choosing this method, however, is that it provides the closest link of assumed depreciation to the actual past investment pattern of each country.



## Appendix 2. Data

Appendix 2 presents basic data on growth performances for a large set of countries. These countries were chosen by a filtering procedure designed to select high-growth episodes. For an episode to qualify as high-growth, it had to last at least five years, begin and end with an annual growth rate greater than 4 percent, and have an average annual growth rate of at least 4 percent over the entire period. The countries in table 1 (page 2) experienced at least one such episode during 1960–2001. In addition to high-growth episodes, we also identify low-growth episodes. These are defined using the same criteria, except we employed the rule of less than 1 percent growth.<sup>46</sup> Finally, the appendix reports on “other” episodes for the same countries. These cover all years within the 1960–2001 span for which data were available and that were not parts of either high- or low-growth episodes.

In the analysis, exports of goods and services are expressed in “real dollars”; we use the SDR-WPI index as a deflator for the “nominal dollars” series. The SDR-WPI is a weighted index of the pro-

ducer prices in France, Germany, Japan, United Kingdom, and United States, using as weights the percentage of each country’s currency in the determination of the SDR.

The producer price indexes used were those reported in line 63 in *International Financial Statistics* (IMF). For Germany, the producer price index was used; for Japan, the wholesale price index; for the UK, the price of industrial output index; for the United States, the producer price index; and for France, the imported raw material index. Those indexes were denominated in the domestic currency and then converted into dollars using the nominal exchange rate reported in the IFS, which is expressed in units of domestic currency per U.S. dollar (.rf). In the UK, the reported nominal exchange rate is expressed in units of U.S. dollars per pound (.rh); thus the inverse of the reported number was used.

France and Germany presented an additional complication: in January 1999, these countries gave up their domestic currencies for the euro, and the IFS began to report the nominal exchange rate between the euro and the dollar. But, it has continued presenting price indexes in the original currency. Therefore, to convert the price index in domestic currency into dollars, we used the irrevocable fixed factors for converting the national currencies into euros

<sup>46</sup> The low-growth episodes reported here are only those experienced by the 41 countries identified by the high-growth criteria. This exercise also excluded very small countries, the Russian Federation, and other countries that formerly belonged to the Soviet Bloc.

(France, F6.559657; and Germany, DM1.95583).

The SDR valuation basket weights have changed several times since 1981 (for the periods before 1981, original weights were used). To smooth the transition from one weighting scheme to the other, we computed a 24-month moving average of the weights (starting 11 months before time  $t$  and ending 12 months after  $t$ , where  $t$  is the month in which the official change of weights took place).

The dates of the changes were January 1996, January 1999, and January 2001. In 1999, the weights of France and Germany (euro area) were unified. In 2001, the weight for the euro was changed; here we applied the percentage change of the euro to our separate weights for the franc and the deutschemark.

For the convenience of readers, we are including in tables 51 and 52 the corresponding data for the United States and the UK, even though they did not experience any high-growth episodes. We are also including table 9 which gives time series of the SDR-WPI index from 1960 through 2002.

**Table 9. SDR-WPI Index, 1995=100**

Year	SDR-WPI	Year	SDR-WPI
1960	19.6	1982	65.3
1961	20.0	1983	64.8
1962	20.2	1984	64.5
1963	20.4	1985	63.7
1964	20.7	1986	68.4
1965	21.3	1987	75.0
1966	21.9	1988	82.1
1967	21.9	1989	83.8
1968	21.9	1990	88.2
1969	22.9	1991	87.8
1970	24.1	1992	89.7
1971	25.1	1993	87.5
1972	27.1	1994	91.6
1973	32.5	1995	100.0
1974	37.8	1996	95.5
1975	40.3	1997	92.1
1976	41.3	1998	88.3
1977	44.9	1999	89.1
1978	50.7	2000	91.4
1979	58.1	2001	89.9
1980	66.8	2002	89.6
1981	67.1		

**Table 10. Components of Growth and Export Performance (%)  
Australia, 1960–2001**

	High Growth 1961–73	Other	High Growth vs Other
GDP growth	5.3	3.1	2.2
Capital Contribution	1.5	1.2	0.3
Labor Contribution	1.3	1.0	0.4
Real cost reduction	2.5	1.0	1.5
Exports growth (in real dollars)	8.1	4.5	
Exports growth – GDP growth	2.7	1.4	
Exports/GDP (beginning, in local currency)	0.14		
Exports/GDP (end, in local currency)	0.14		

**Table 11. Components of Growth and Export Performance (%)  
Canada, 1965–2001**

	High Growth 1965–73	Other 1973–2001	High Growth vs Other
GDP growth	5.1	2.9	2.2
Capital Contribution	0.7	1.1	–0.4
Labor Contribution	1.5	0.9	0.5
Real cost reduction	2.9	0.9	2.1
Exports growth (in real dollars)	8.8	4.8	
Exports growth – GDP growth	3.8	1.9	
Exports/GDP (beginning, in local currency)	0.19		
Exports/GDP (end, in local currency)	0.23		

**Table 12. Components of Growth and Export Performance (%)  
Finland, 1960–2001**

	High Growth 1960–73	High Growth 1993–2000	Other	High Growth vs Other
GDP growth	5.0	4.7	1.9	2.9
Capital Contribution	1.8	0.4	1.1	0.0
Labor Contribution	0.4	0.0	0.3	-0.1
Real cost reduction	2.8	4.3	0.5	3.0
Exports growth (in real dollars)	7.5	12.4	4.3	
Exports growth – GDP growth	2.5	7.7	2.3	
Exports/GDP (beginning, in local currency)	0.21	0.35		
Exports/GDP (end, in local currency)	0.25	0.38		

**Table 13. Components of Growth and Export Performance (%)  
France, 1960–2001**

	High Growth 1960–73	Other 1973–2001	High Growth vs Other
GDP growth	5.4	2.3	3.1
Capital Contribution	1.4	0.9	0.5
Labor Contribution	0.5	0.3	0.2
Real cost reduction	3.5	1.1	2.4
Exports growth (in real dollars)	9.5	4.8	
Exports growth – GDP growth	4.1	2.5	
Exports/GDP (beginning, in local currency)	0.13		
Exports/GDP (end, in local currency)	0.18		

**Table 14. Components of Growth and Export Performance (%)**  
Greece, 1960–2001

	High Growth 1960–73	Low Growth 1979–87	Other	High Growth vs Low Growth	High Growth vs Other
GDP growth	7.9	0.0	2.7	7.9	5.2
Capital Contribution	2.1	0.5	1.0	1.6	1.1
Labor Contribution	0.1	0.5	0.5	–0.5	–0.4
Real cost reduction	5.7	–1.1	1.2	6.8	4.5
Exports growth (in real dollars)	12.5	3.8	6.7		
Exports growth – GDP growth	4.6	3.8	4.0		
Exports/GDP (beginning, in local currency)	0.09				
Exports/GDP (end, in local currency)	0.14				

**Table 15. Components of Growth and Export Performance (%)**  
Japan, 1960–2001

	High Growth 1960–90	Low Growth 1990–2001	High Growth vs Low Growth
GDP growth	6.4	1.2	5.1
Capital Contribution	4.9	4.6	0.2
Labor Contribution	0.6	0.4	0.1
Real cost reduction	0.9	–3.8	4.7
Exports growth (in real dollars)	11.3	3.6	
Exports growth – GDP growth	5.0	2.3	
Exports/GDP (beginning, in local currency)	0.10		
Exports/GDP (end, in local currency)	0.14		

**Table 16. Components of Growth and Export Performance (%)  
Ireland, 1960-2000**

	High Growth 1966-78	High Growth 1986-2000	Other	High Growth vs Other
GDP growth	5.3	7.0	2.7	3.4
Cap. Contribution	1.4	1.0	1.4	-0.2
Lab. Contribution	0.4	0.7	0.2	0.4
Real cost reduction	3.5	5.2	1.1	3.2
Exports growth (in real dollars)	8.6	12.8	7.4	
Exports growth - GDP growth	3.3	5.8	4.7	
Exports/GDP (beginning, in local curr.)	0.38	0.56		
Exports/GDP (end, in local curr.)	0.50	0.87		

**Table 17. Components of Growth and Export Performance (%)  
New Zealand, 1960-2001**

	High Growth 1960-66	High Growth 1968-74	Low Growth 1974-80	Low Growth 1986-92	Other	High Growth vs Low Growth	High Growth vs Other
GDP growth	5.5	5.2	-0.8	0.1	2.6	5.7	2.8
Capital Contribution	1.4	1.0	0.4	0.7	1.1	0.6	0.1
Labor Contribution	1.2	1.2	0.7	1.1	0.9	0.3	0.3
Real cost reduction	2.9	3.1	-1.8	-1.7	0.7	4.7	2.3
Exports growth (in real dollars)	4.2	6.1	4.7	3.9	3.4		
Exports growth - GDP growth	-1.4	0.9	5.5	3.8	0.7		
Exports/GDP (beginning, in local currency)	0.23	0.25					
Exports/GDP (end, in local currency)	0.22	0.21					

**Table 18. Components of Growth and Export Performance (%)  
Norway, 1960–2001**

	<b>High Growth 1970–77</b>	<b>Other</b>	<b>High Growth vs Other</b>
GDP growth	5.0	3.4	1.6
Capital Contribution	2.5	1.4	1.1
Labor Contribution	1.0	0.5	0.5
Real cost reduction	1.4	1.4	0.0
Exports growth (in real dollars)	7.4	5.4	
Exports growth – GDP growth	2.4	2.0	
Exports/GDP (beginning, in local currency)	0.35		
Exports/GDP (end, in local currency)	0.35		

**Table 19. Components of Growth and Export Performance (%)  
Portugal, 1960–2001**

	<b>High Growth 1960–73</b>	<b>High Growth 1975–80</b>	<b>High Growth 1985–91</b>	<b>Other</b>	<b>High Growth vs Other</b>
GDP growth	6.9	5.1	5.5	1.5	4.3
Capital Contribution	1.8	1.1	1.1	1.3	0.0
Labor Contribution	0.1	1.6	0.1	0.5	0.1
Real cost reduction	4.9	2.3	4.3	-0.3	4.2
Exports growth (in real dollars)	9.6	-2.9	14.5	8.1	
Exports growth – GDP growth	2.7	-8.0	9.1	6.5	
Exports/GDP (beginning, in local currency)	0.16	0.16	0.23		
Exports/GDP (end, in local currency)	0.20	0.18	0.25		

**Table 20. Components of Growth and Export Performance (%)  
Spain, 1960–2001**

	<b>High Growth 1960–74</b>	<b>Other 1974–2001</b>	<b>High Growth vs Other</b>
GDP growth	7.2	2.6	4.6
Capital Contribution	1.7	1.1	0.6
Labor Contribution	0.4	0.6	-0.2
Real cost reduction	5.1	0.9	4.2
Exports growth (in real dollars)	15.2	7.4	
Exports growth – GDP growth	8.0	4.8	
Exports/GDP (beginning, in local currency)	0.11		
Exports/GDP (end, in local currency)	0.14		

**Table 21. Components of Growth and Export Performance (%)  
China, 1962–2001**

	<b>High Growth 1962–81</b>	<b>High Growth 1981–2001</b>
GDP growth	7.8	9.8
Capital Contribution	2.0	2.8
Labor Contribution	1.2	0.8
Real cost reduction	4.5	6.3
Exports growth (in real dollars)	7.3	12.3
Exports growth – GDP growth	-0.5	2.4

**Table 22. Components of Growth and Export Performance (%)  
Hong Kong, 1960–2001**

	<b>High Growth 1960–97</b>	<b>Other 1997–2001</b>	<b>High Growth vs Other</b>
GDP growth	8.0	2.1	5.9
Capital Contribution	2.3	1.8	0.5
Labor Contribution	1.4	0.6	0.8
Real cost reduction	4.3	–0.3	4.5
Exports growth (in real dollars)	11.5	1.5	
Exports growth – GDP growth	3.5	–0.6	
Exports/GDP (beginning, in local currency)	0.85		
Exports/GDP (end, in local currency)	1.29		

**Table 23. Components of Growth and Export Performance (%)  
Korea, 1960–2001**

	<b>High Growth 1960–97</b>	<b>Other 1997–2001</b>	<b>High Growth vs Other</b>
GDP growth	7.9	4.1	3.8
Capital Contribution	2.0	1.3	0.6
Labor Contribution	1.4	0.8	0.6
Real cost reduction	4.6	2.0	2.6
Exports growth (in real dollars)	17.2	9.1	
Exports growth – GDP growth	9.3	4.9	
Exports/GDP (beginning, in local currency)	0.05		
Exports/GDP (end, in local currency)	0.32		

**Table 24. Components of Growth and Export Performance (%)  
Malaysia, 1960–2001**

	High Growth 1960–87	High Growth 1987–97	Other 1997–2001	High Growth vs Other
GDP growth	6.5	9.3	1.9	6.0
Capital Contribution	1.8	3.6	1.2	1.6
Labor Contribution	1.6	1.5	1.6	0.0
Real cost reduction	3.1	4.1	-0.9	4.5
Exports growth (in real dollars)	5.9	11.7	14.3	
Exports growth – GDP growth	-0.6	2.4	12.4	
Exports/GDP (beginning, in local currency)	0.49	0.66		
Exports/GDP (end, in local currency)	0.66	0.93		

**Table 25. Components of Growth and Export Performance (%)  
Singapore, 1964–2000**

	High Growth 1964–2000
GDP growth	8.9
Capital Contribution	2.9
Labor Contribution	1.6
Real cost reduction	4.4
Exports growth (in real dollars)	10.5
Exports growth – GDP growth	1.6
Exports/GDP (beginning, in local currency)	1.01
Exports/GDP (end, in local currency)	1.42

**Table 26. Components of Growth and Export Performance (%)**  
Thailand, 1960–2001

	High Growth 1960–86	High Growth 1986–96	Other 1996– 2001	High Growth vs Other
GDP growth	7.1	9.5	–0.2	8.5
Capital Contribution	2.2	3.4	0.1	2.7
Labor Contribution	1.5	1.0	0.6	0.7
Real cost reduction	3.4	5.1	–0.9	5.2
Exports growth (in real dollars)	8.3	15.2	2.8	
Exports growth – GDP growth	1.2	5.7	3.0	
Exports/GDP (beginning, in local currency)	0.19	0.33		
Exports/GDP (end, in local currency)	0.26	0.48		

**Table 27. Components of Growth and Export Performance (%)**  
India, 1960–2001

	Other 1960–79	High Growth 1979–2001	High Growth vs Other
GDP growth	2.8	5.7	2.8
Capital Contribution	1.2	1.5	0.3
Labor Contribution	1.1	1.0	0.0
Real cost reduction	0.6	3.1	2.6
Exports growth (in real dollars)	4.0	6.8	
Exports growth – GDP growth	1.2	1.2	
Exports/GDP (beginning, in local currency)		6.6	
Exports/GDP (end, in local currency)		13.5	

**Table 28. Components of Growth and Export Performance (%)  
Indonesia, 1960–2001**

	High Growth 1967–97	Other	High Growth vs Other
GDP growth	7.4	0.9	6.5
Capital Contribution	1.8	1.1	0.7
Labor Contribution	1.4	1.0	0.3
Real cost reduction	4.2	-1.2	5.4
Exports growth (in real dollars)	13.9	1.4	
Exports growth – GDP growth	6.5	0.5	
Exports/GDP (beginning, in local currency)	0.11		
Exports/GDP (end, in local currency)	0.28		

**Table 29. Components of Growth and Export Performance (%)  
Israel, 1960–2001**

	High Growth 1960–96	Other 1996–2001	High Growth vs Other
GDP growth	6.1	2.6	3.5
Capital Contribution	1.4	1.4	0.0
Labor Contribution	1.6	1.5	0.1
Real cost reduction	3.1	-0.3	3.4
Exports growth (in real dollars)	7.8	8.0	
Exports growth – GDP growth	1.7	5.3	
Exports/GDP (beginning, in local currency)	0.21		
Exports/GDP (end, in local currency)	0.31		

**Table 30. Components of Growth and Export Performance (%)**  
Pakistan, 1960–2001

	High Growth 1960–96	Other 1996–2001	High Growth vs Other
GDP growth	5.9	3.3	2.6
Capital Contribution	1.4	0.6	0.8
Labor Contribution	1.4	1.6	-0.1
Real cost reduction	3.0	1.1	1.9
Exports growth (in real dollars)	6.1	0.4	
Exports growth – GDP growth	0.3	-2.9	
Exports/GDP (beginning, in local currency)	0.09		
Exports/GDP (end, in local currency)	0.17		

**Table 31. Components of Growth and Export Performance (%)**  
Philippines, 1960–2001

	High Growth 1960–80	Other 1980–2001	High Growth vs Other
GDP growth	5.4	2.4	3.0
Capital Contribution	1.4	1.1	0.4
Labor Contribution	1.5	1.4	0.1
Real cost reduction	2.5	0.0	2.6
Exports growth (in real dollars)	7.7	9.2	
Exports growth – GDP growth	2.3	6.8	
Exports/GDP (beginning, in local currency)	0.11		
Exports/GDP (end, in local currency)	0.21		

**Table 32. Components of Growth and Export Performance (%)  
Cameroon, 1972–2001**

	High Growth 1972–86	Low Growth 1986–94	High Growth 1994–2001	High Growth vs Low Growth
GDP growth	8.2	-3.8	4.6	10.2
Capital Contribution	1.3	-0.3	0.1	1.0
Labor Contribution	1.1	1.4	1.2	-0.2
Real cost reduction	5.9	-4.8	3.3	9.4
Exports growth (in real dollars)	11.6	-11.0	19.0	
Exports growth – GDP growth	3.3	-7.2	14.4	
Exports/GDP (beginning, in local currency)	0.22		24.5	
Exports/GDP (end, in local currency)	0.24		25.4	

**Table 33. Components of Growth and Export Performance (%)  
Egypt, 1960–2001**

	High Growth 1960–75	High Growth 1975–2001
GDP growth	4.8	5.8
Capital Contribution	1.4	1.8
Labor Contribution	1.1	1.3
Real cost reduction	2.4	2.6
Exports growth (in real dollars)	4.0	5.4
Exports growth – GDP growth	-0.8	-0.4
Exports/GDP (beginning, in local currency)	0.21	17.9
Exports/GDP (end, in local currency)	0.18	17.5

**Table 34. Components of Growth and Export Performance (%)  
Morocco, 1960–2001**

	<b>High Growth 1966–77</b>	<b>Other</b>	<b>High Growth vs Other</b>
GDP growth	6.8	3.5	3.3
Capital Contribution	1.8	1.0	0.9
Labor Contribution	1.4	1.2	0.2
Real cost reduction	3.6	1.3	2.3
Exports growth (in real dollars)	6.1	3.3	
Exports growth – GDP growth	–0.6	–0.2	
Exports/GDP (beginning, in local currency)	0.20		
Exports/GDP (end, in local currency)	0.18		

**Table 35. Components of Growth and Export Performance (%)  
South Africa, 1960–2001**

	<b>High Growth 1960–74</b>	<b>Other 1974–2001</b>	<b>High Growth vs Other</b>
GDP growth	6.1	1.7	4.3
Capital Contribution	1.1	0.8	0.3
Labor Contribution	1.2	1.2	0.0
Real cost reduction	3.8	–0.2	4.0
Exports growth (in real dollars)	6.4	1.9	
Exports growth – GDP growth	0.3	0.1	
Exports/GDP (beginning, in local currency)	0.30		
Exports/GDP (end, in local currency)	0.28		

**Table 36. Components of Growth and Export Performance (%)  
Argentina, 1960–2001**

	<b>High Growth 1990–98</b>	<b>Other</b>	<b>High Growth vs Other</b>
GDP growth	6.4	1.5	4.9
Capital Contribution	1.1	0.9	0.2
Labor Contribution	1.0	0.7	0.3
Real cost reduction	4.3	-0.1	4.4
Exports growth (in real dollars)	14.4	6.8	
Exports growth – GDP growth	8.1	5.4	
Exports/GDP (beginning, in local currency)	0.10		
Exports/GDP (end, in local currency)	0.11		

**Table 37. Components of Growth and Export Performance (%)  
Brazil, 1960–2001**

	<b>High Growth 1960–80</b>	<b>Other 1980–2001</b>	<b>High Growth vs Other</b>
GDP growth	7.3	2.1	5.2
Capital Contribution	2.0	0.8	1.2
Labor Contribution	1.6	1.3	0.4
Real cost reduction	3.7	0.0	3.6
Exports growth (in real dollars)	10.5	4.8	
Exports growth – GDP growth	3.2	2.7	
Exports/GDP (beginning, in local currency)	0.07		
Exports/GDP (end, in local currency)	0.09		

**Table 38. Components of Growth and Export Performance (%)**  
Chile, 1960–2001

	High Growth 1975–81	High Growth 1983–98	Other	High Growth vs Other
GDP growth	6.9	7.4	1.4	5.7
Capital Contribution	0.8	1.9	1.5	-0.1
Labor Contribution	1.2	1.2	1.0	0.2
Real cost reduction	4.9	4.3	-1.1	5.6
Exports growth (in real dollars)	11.1	8.4	4.6	
Exports growth – GDP growth	4.2	1.0	3.3	
Exports/GDP (beginning, in local currency)	0.25	0.24		
Exports/GDP (end, in local currency)	0.16	0.26		

**Table 39. Components of Growth and Export Performance (%)**  
Colombia, 1960–2001

	High Growth 1960–80	High Growth 1985–95	Other	High Growth vs Other
GDP growth	5.4	4.5	1.6	3.4
Capital Contribution	1.2	1.1	0.9	0.2
Labor Contribution	1.4	1.7	1.7	-0.1
Real cost reduction	2.8	1.8	-1.1	3.4
Exports growth (in real dollars)	5.2	6.8	2.9	
Exports growth – GDP growth	-0.2	2.3	1.3	
Exports/GDP (beginning, in local currency)	0.13	0.19		
Exports/GDP (end, in local currency)	0.16	0.15		

**Table 40. Components of Growth and Export Performance (%)**  
Costa Rica, 1960–2001

	High Growth 1961–79	High Growth 1983–99	Other	High Growth vs Other
GDP growth	6.5	5.1	-0.5	6.4
Capital Contribution	1.3	1.2	0.8	0.5
Labor Contribution	2.0	1.6	1.8	0.0
Real cost reduction	3.2	2.3	-3.1	5.9
Exports growth (in real dollars)	8.1	11.4	-5.0	
Exports growth – GDP growth	1.5	6.2	-4.4	
Exports/GDP (beginning, in local currency)	0.23	0.34		
Exports/GDP (end, in local currency)	0.27	0.52		

**Table 41. Components of Growth and Export Performance (%)**  
Ecuador, 1960–2001

	High Growth 1969–81	Other	High Growth vs Other
GDP growth	8.4	2.7	5.7
Capital Contribution	1.8	0.8	1.0
Labor Contribution	1.4	1.6	-0.1
Real cost reduction	5.2	0.4	4.8
Exports growth (in real dollars)	13.5	-17.6	
Exports growth – GDP growth	5.1	-20.3	
Exports/GDP (beginning, in local currency)	0.13		
Exports/GDP (end, in local currency)	0.25		

**Table 42. Components of Growth and Export Performance (%)**  
El Salvador, 1964–2001

	High Growth 1964–78	Low Growth 1978–86	High Growth 1989–95	Other	High Growth vs Low Growth	High Growth vs Other
GDP growth	4.9	-3.6	6.0	2.5	9.0	2.9
Capital Contribution	1.0	0.0	1.2	1.0	1.1	0.1
Labor Contribution	1.7	1.0	1.8	1.5	0.7	0.2
Real cost reduction	2.2	-4.6	3.0	0.0	7.2	2.6
Exports growth (in real dollars)	6.0	-0.6	13.5	4.4		
Exports growth – GDP growth	1.1	3.0	7.5	1.9		
Exports/GDP (beginning, in local currency)	0.27		0.19			
Exports/GDP (end, in local currency)	0.30		0.22			

**Table 43. Components of Growth and Export Performance (%)**  
Guatemala, 1960–2001

	High Growth 1960–80	Low Growth 1980–86	Other 1986–2001	High Growth vs Low Growth	High Growth vs Other
GDP growth	5.6	-0.9	3.8	6.5	1.7
Capital Contribution	0.8	0.1	0.6	0.7	0.2
Labor Contribution	1.4	1.3	1.6	0.1	-0.2
Real cost reduction	3.4	-2.4	1.7	5.7	1.7
Exports growth (in real dollars)	7.7	0.1	6.0		
Exports growth – GDP growth	2.1	1.0	2.1		
Exports/GDP (beginning, in local currency)	0.13				
Exports/GDP (end, in local currency)	0.22				

**Table 44. Components of Growth and Export Performance (%)  
Honduras, 1960–2001**

	High Growth 1961–68	High Growth 1977–79	Other	High Growth vs Other
GDP growth	6.0	8.9	2.8	4.6
Capital Contribution	1.4	1.7	1.2	0.4
Labor Contribution	1.4	1.8	1.7	-0.1
Real cost reduction	3.1	5.4	-0.1	4.3
Exports growth (in real dollars)	13.3	14.3	3.1	
Exports growth – GDP growth	7.3	5.4	0.2	
Exports/GDP (beginning, in local currency)	0.22	0.33		
Exports/GDP (end, in local currency)	0.31	0.37		

**Table 45. Components of Growth and Export Performance (%)  
Jamaica, 1965–2001**

	High Growth 1965–72	Low Growth 1972–85	Low Growth 1995–2000	Other	High Growth vs Low Growth	High Growth vs Other
GDP growth	6.7	-1.9	-0.6	3.1	7.9	3.5
Capital Contribution	2.6	0.0	1.3	1.6	2.0	1.0
Labor Contribution	0.6	1.4	0.6	0.8	-0.4	-0.1
Real cost reduction	3.4	-3.3	-2.5	0.7	6.3	2.7
Exports growth (in real dollars)	4.5	-1.0	5.0	4.9		
Exports growth – GDP growth	-2.2	0.9	5.6	1.8		
Exports/GDP (beginning, in local currency)	0.37					
Exports/GDP (end, in local currency)	0.33					

**Table 46. Components of Growth and Export Performance (%)  
Mexico, 1960–2001**

	High Growth 1960–81	High Growth 1995–2000	Other	High Growth vs Other
GDP growth	6.8	5.4	1.3	4.8
Capital Contribution	1.4	1.1	0.7	0.5
Labor Contribution	1.8	1.2	1.6	-0.1
Real cost reduction	3.7	3.1	-1.0	4.4
Exports growth (in real dollars)	9.0	17.9	6.6	
Exports growth – GDP growth	2.2	12.5	5.3	
Exports/GDP (beginning, in local currency)	0.11	0.32		
Exports/GDP (end, in local currency)	0.10	0.31		

**Table 47. Components of Growth and Export Performance (%)  
Paraguay, 1960–2001**

	High Growth 1960–81	Other 1981–2001	High Growth vs Other
GDP growth	6.7	2.1	4.6
Capital Contribution	1.3	1.0	0.3
Labor Contribution	1.5	1.5	-0.1
Real cost reduction	3.9	-0.4	4.3
Exports growth (in real dollars)	7.5	5.7	
Exports growth – GDP growth	0.7	3.6	
Exports/GDP (beginning, in local currency)	0.18		
Exports/GDP (end, in local currency)	0.11		

**Table 48. Components of Growth and Export Performance (%)**  
Peru, 1960–2001

	High Growth 1960–74	Low Growth 1987–92	High Growth 1992–97	Other	High Growth vs Low Growth	High Growth vs Other
GDP growth	5.3	-4.8	7.1	2.3	11.0	3.9
Capital Contribution	0.7	0.5	1.5	0.9	0.6	0.2
Labor Contribution	1.3	1.4	1.5	1.5	0.0	-0.1
Real cost reduction	3.4	-6.7	4.0	-0.1	10.4	3.8
Exports growth (in real dollars)	5.3	-2.2	12.9	2.6		
Exports growth – GDP growth	0.0	2.6	5.8	0.3		
Exports/GDP (beginning, in local currency)	0.25		0.12			
Exports/GDP (end, in local currency)	0.16		0.14			

**Table 49. Components of Growth and Export Performance (%)**  
Uruguay, 1960–2001

	High Growth 1974–80	High Growth 1990–98	Other	High Growth vs Other
GDP growth	4.8	4.4	0.4	-4.2
Capital Contribution	1.7	0.9	0.2	1.1
Labor Contribution	0.3	0.6	0.5	-0.1
Real cost reduction	2.8	2.9	-0.4	3.2
Exports growth (in real dollars)	7.1	9.4	2.2	
Exports growth – GDP growth	2.3	5.0	1.8	
Exports/GDP (beginning, in local currency)	0.16	0.21		
Exports/GDP (end, in local currency)	0.15	0.20		

**Table 50. Components of Growth and Export Performance (%)**  
Venezuela, 1960–2001

	High Growth 1960–65	Low Growth 1979–85	Other	High Growth vs Low Growth	High Growth vs Other
GDP growth	6.2	-1.5	3.0	7.7	3.2
Capital contribution	0.7	0.4	0.9	0.2	-0.2
Labor contribution	1.6	1.8	1.8	-0.2	-0.2
Real cost reduction	3.9	-3.8	0.3	7.7	3.6
Exports growth (in real dollars)	0.4	-1.6	6.0		
Exports growth – GDP growth	-5.8	-0.1	3.0		
Exports/GDP (beginning, in local Currency)	0.34				
Exports/GDP (end, in local Currency)	0.31				

**Table 51. Components of Growth and Export Performance (%)**  
United States, 1960–2001

	Other
GDP growth	3.4
Capital contribution	0.9
Labor contribution	0.9
Real cost reduction	1.6
Exports growth (in real dollars)	5.7
Exports growth – GDP growth	2.3
Exports/GDP (beginning, in local Currency)	0.05
Exports/GDP (end, in local Currency)	0.11

**Table 52. Components of Growth and Export Performance (%)  
United Kingdom, 1960–2001**

	<b>Other</b>
GDP growth	2.4
Capital contribution	0.8
Labor contribution	0.2
Real cost reduction	1.4
Exports growth (in real dollars)	5.1
Exports growth – GDP growth	2.7
Exports/GDP (beginning, in local Currency)	0.20
Exports/GDP (end, in local Currency)	0.28

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# ON GROWTH, INVESTMENT, CAPITAL AND THE RATE OF RETURN

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# ON GROWTH, INVESTMENT, CAPITAL AND THE RATE OF RETURN

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Arnold C. Harberger, University of California, Los Angeles.

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# ON GROWTH, INVESTMENT, CAPITAL AND THE RATE OF RETURN

This paper is aimed at introducing economic analysts and other interested parties to some interesting twists and turns that arise as one juxtaposes basic economic theory to real-world data. Readers will, I think, be quite surprised at the insights one gets from some very simple exercises. In addition many may be led to appreciate aspects of a country's economic life of which they previously had little awareness. To give some focus to our story, we will concentrate on the idea that somehow "hidden" in the standard national accounts of a country, lies the basis for measuring the contribution of investment to the growth process, and also an overall "real" rate of return to reproducible capital in the country. In subsequent exercises, we will explore breaking down the capital stock of the country into segments, with different rates of return applying to each segment. In the process we will explore how to build up a series of estimates of the "real" reproducible capital stock of a country; how to deal with land as an additional component of the total capital stock; how to allow for the special attributes of residential housing as a component of the capital stock and as a generator of a stream of real returns; how to handle the contributions of government investments in infrastructural items that yield little or no cash revenues; and finally, how to isolate the real rate of return to what might be called "ordinary business capital" apart from housing.

## EXPRESSING GROSS INVESTMENT IN REAL TERMS

Nearly all national accounts systems present time series on gross investment. Most of them include under this concept both private and public investment, and in this paper we will assume that we are dealing with such a case. Non-economist readers should be aware that the focus of the national accounts is on the flow of goods and services being produced, consumed, or invested in a given period. Under this concept, a country cannot invest in land, except by such actions as clearing, leveling, fencing, etc., and, of course, reclaiming land from rivers, lakes or seas. Thus the private purchase of a farm or residential lot is indeed an investment from the purchaser's point of view, but the national accounts view it as a disinvestment by the seller of same. These two entries cancel from the national accounts point of view. The same goes for the purchase and sale of a manufacturing plant or a truck, or any other pre-existing asset. The gross domestic investment that the national accounts measure consists of the goods and services that were produced in the country and used for domestic investment in the given period, plus imported goods and services that likewise ended up being used for domestic investment in that same period. The sum of these two items is what the national accounts typically label gross investment.

To express investment in real terms, one needs to deflate the gross investment figure by some relevant price index. Most countries develop as part of their national accounting procedures an investment goods price index. For the purposes of the present paper, however, we want to use a more general index, the GDP deflator. The reason for this is that we are headed toward a direct measurement of the rate of return to capital. This consists of a ratio between the "return to capital" in the numerator and

the “stock of capital” in the denominator. Obviously, one cannot take such a ratio and call it a rate of return if the numerator and denominator are measured in different units. Our procedure will end up measuring both numerator and denominator in units of “GDP baskets” of constant purchasing power (e.g., in terms of pesos of the year 2000 or some other base year). The “return to capital” in the numerator is obtained simply by summing the various sources of capital income (profits, interest, rents, etc.), usually in nominal pesos, then expressing this income as a fraction of nominal GDP, and then applying this fraction to the country’s real GDP. In our numerical exercises, we will operate with alternative assumptions about the fraction of real GDP going to reproducible capital.

## BUILDING A CAPITAL STOCK TIME SERIES

The simplest method for building a capital stock on the basis of investment data uses what is called the **perpetual inventory approach**. This applies the following operation:

End of 2006 capital stock  
**equals**  
 End of 2005 capital stock  
**plus**  
 Gross Investment During 2006  
**minus**  
 Depreciation of Existing Stock During 2006

In symbols:

$$K_t = K_{t-1}(1-\delta) + I_{gt}$$

where  $K_t$  is the capital stock at the end of period  $t$ ,  $I_{gt}$  is gross investment during period  $t$  and  $\delta$  is the fraction of last year’s capital stock that depreciates (in real terms) during period  $t$ . The formula provides a rolling evolution of the capital stock, moving from one year to the next by adding the next year’s new investment and subtracting the real depreciation of the old capital stock during that same next year.

The question obviously arises, under this procedure, from where do we get an estimate of the initial capital stock (for some past year) from which to start this chain-link process? Here we will describe what is probably the simplest method for doing so. Alternative techniques are outlined in a companion paper.

Our simplest technique is based on a result that characterizes “growth equilibrium” under nearly all approaches to the analysis of economic growth. This result states that in growth equilibrium an “equilibrium capital/output (K/Y) ratio” prevails, which in turn means that the capital stock series (K) and the real GDP (or other output) series grow at the same rate. To get an estimate of  $K_0$  (say K at the end of 1969) using the assumption of growth equilibrium, we assume that during 1970 both K and Y grew at the same rate. The increment to K is  $\Delta K_{70} = I_{70} - \delta K_{69}$ , the rate of increase of capital is  $(\Delta K_{70}/K_{69}) = (I_{70}/K_{69}) - \delta = \Delta Y_{70}/Y_{69}$ , the rate of increase of output. Since we have data on  $I_{70}$ ,  $\Delta Y_{70}$ , and  $Y_{69}$ , and since our procedure uses an assumed value for  $\delta$ , the above equation can be

solved for  $K_{69}$ , which then can be used as the starting point for the chain-link, perpetual inventory method.<sup>1</sup>

We have yet to speak of the depreciation rate,  $\delta$ . It would be nice if the national accounts would give us an accurate picture of the real depreciation occurring in an economy each year. But in fact the underlying data are distorted by several important factors:

- a. In most countries, business accounts are kept in nominal terms with no attempt to convert them into real terms. Firms thus deduct as depreciation for each year a specified fraction of the nominal price paid for each asset. When inflation has intervened between the year of purchase of the asset and the year for which depreciation is being calculated, this leads to a significant understatement of depreciation.
- b. In many countries, governments permit the accelerated depreciation of assets for tax purposes. In these cases tax depreciation often far exceeds true economic depreciation.
- c. Independent of government policy, business firms typically have an incentive to exaggerate depreciation, as this gives them a bigger deduction for tax purposes.

For the above reasons one can have little reliance on national accounts depreciation unless a very explicit effort has been made by the national accounts people themselves to do exercises of the type we are here examining. Hence nearly all economists who engage in the exercise of building time series of the real capital stock make assumptions as to plausible rates of real depreciation. The best way to do this is to build separate capital stock series for buildings, machinery and equipment, vehicles and inventories (plus other categories if and when the data exist and the categories seem relevant). However, to do this using direct data one requires annual national accounts investment to be broken down into these component parts. In the absence of such a breakdown, and/or in studies in which a common methodology is being applied to many countries, the practice has been to make a sensible assumption as to the average rate of depreciation of the country's reproducible capital stock.

Here we will assume the rate of real depreciation on the entire stock of reproducible capital to be 4%. To justify this, we develop a "scenario analysis" showing the coherency and plausibility of the various components of the story.

First, we assume an economy in which real GDP is growing at the rate of 3% per year, and in which real gross investment averages 20% of real GDP. This investment in turn is broken down as follows:

investment in:

buildings, roads, bridges, etc. = 45% of  $I_g$ , with a depreciation rate of 2%

machinery and equipment = 30% of  $I_g$ , with a depreciation rate of 8%

vehicles = 22% of  $I_g$  with a depreciation rate of 12%

---

<sup>1</sup> In my own applications I have tried to use for  $I_{70}$  in the above formula an average like  $(I_{69}+I_{70}+I_{71})/3$  and for  $(\Delta Y_{70}/Y_{69})$  an average of  $(\Delta Y_{69}/Y_{68})$ ,  $(\Delta Y_{70}/Y_{69})$  and  $(\Delta Y_{71}/Y_{70})$ . This helps guard against the chosen year being erratic in the sense of the real capital stock and real GDP growing at substantially different rates. In choosing the starting date for a given country, we also have tried to avoid "abnormal" periods (export booms, cyclical recessions, major inflationary bursts, etc.) Others would be well advised to adopt the same precautions.

inventory investment = 3% of  $I_g$ , with a zero depreciation rate  
 (Standard national accounting practice considers inventory investment to represent the **net** increment to inventories. The depletion of old inventories has thus automatically been deducted in arriving at national accounts investment.)

Table 1 shows data for a typical year in such an economy. Gross investment is taken to be 100 in that year, so GDP is 500. What we do in the table is to build equilibrium stocks of the different types of capital, following the “rule” that the equilibrium stock  $K_{j,t-1}$  is equal to  $I_{gjt}/(g+\delta_j)$ . Where  $I_{gjt}$  = gross investment of type  $j$  in year  $t$ , and  $g$  = GDP growth rate.

To these assumptions we add the allocation of annual investment—45% to buildings, 30% to machinery and equipment, 22% to vehicles (row a of Table 1 below). Three percent of  $I_g$  is allocated to inventory investment, but this figure is based not on total investment, but on the growth of GDP. The assumption is that 20% of the increment to GDP is represented by inventory accumulation. This assumption in turn leads to an estimated total stock of inventory capital that is equal to 20% of one year’s GDP (= 100, in the units of the table). The assumed depreciation rates for the types of depreciable capital are shown in row b. Then the capital stocks of those three types are estimated by dividing the current gross investment of that type by  $(.03 + \delta_j)$ , as shown in row c. This assumes that we are in growth equilibrium for each of these classifications of capital. The resulting capital stocks are shown in row d. Together with the estimate of 100 for inventory capital, they add up to a total capital stock of 1420. When we apply the depreciation rate appropriate to each type of capital stock, we get the depreciation amount shown in row d. These add up to 57.5, or almost exactly 4% of the estimated total capital stock of 1420.

**TABLE 1: SCENARIO ANALYSIS CAPITAL STOCKS AND DEPRECIATION AMOUNTS (BY TYPE OF CAPITAL)**

	Buildings	Machinery & Equipment	Vehicles
a) Investment in year $t$	$.45 I_{gt} = 45$	$.30 I_{gt} = 30$	$.22 I_{gt} = 22$
b) Depreciation Rate ( $\delta_j$ )	.02	.08	.12
c) Capital Stock (= Investment/ $(.03+\delta_j)$ )	900	273	147
d) Depreciation Amount	18	21.84	17.64
<b>Total Depreciation = 57.5</b>			

$$\text{Inventory Investment} = 20\% \text{ of } \Delta Y$$

$$\Delta Y = .03Y = .03 \quad 500 = 15$$

$$\text{Inventory Investment} = .2 \Delta Y = 3.0$$

If each  $\Delta Y$  leads to inventory investment of  $.2\Delta Y$ , then the total stock of inventory capital should be  $.2Y$ , or 100.

Total Reproducible Capital Stock = 900 + 273 + 147 + 100 = 1420

$$\delta = \text{Depreciation/Reproducible Capital Stock} = 57.5/1420 \approx 4\%$$

This example is intended to give readers a sense of how this analysis is not just a blatant wave-of-the-hands assumption, but rather a quite “textured” picture of the structure of a growing economy with capital stocks of different economic lives.

In point of fact, we will show later that our main conclusions would not differ much if the average depreciation rate were 3% or 5%. So readers should take from this exercise the reassurance of the seriousness of the framework, and not worry about the precise figure of an average 4% annual depreciation rate.

## ECONOMIC GROWTH AND THE RETURN TO CAPITAL

A standard breakdown of a country’s growth rate is the following:

$$(1) \quad \frac{\Delta Y}{Y} = s_L \frac{\Delta L}{L} - s_K \frac{\Delta K}{K} + \frac{R}{Y}$$

Here  $(\Delta Y/Y)$  is the rate of growth of GDP,  $(\Delta L/L)$  is the rate of growth of the employed labor force,  $(\Delta K/K)$  is the rate of growth of the country’s reproducible capital stock and  $(R/Y)$  represents the amount of real cost reduction accomplished in the economy in the period in question, expressed as a function of GDP.  $s_L$  and  $s_K$  are the shares of labor and capital in GDP. One can see that the first two terms attribute to the increments of labor and capital, respectively, contributions measured by their respective shares in GDP.

The main objective of this section is to point out that the earnings of capital can be thought of as capital’s gross-of-depreciation rate of return  $(\rho + \delta)$  times  $K_{t-1}$ , the beginning of period capital stock; and the share of capital is therefore  $(\rho + \delta)K_{t-1}/Y_t$ . Taking the share of capital times  $\Delta K_t/K_{t-1}$  we get:

$$(2) \quad \frac{(\rho + \delta)K_{t-1}}{Y_t} \times \frac{\Delta K_t}{K_{t-1}} = (\rho + \delta) \times \frac{\Delta K_t}{Y_t}$$

that is, expressed in words:

capital’s contribution to growth in year t  $\frac{\text{net investment}}{\text{GDP}} = \text{gross-of-depreciation rate of return}$

This is a much more insightful, much more intuitive, and much more readily communicable way of representing capital’s contribution to the growth rate than the standard “share of capital” times “rate of net increase in the capital stock”. Most business owners and business executives would boggle at the standard definition, but all of them would quickly grasp the meaning (and the common sense) of measuring investment’s contribution to growth as being equal to net investment times an appropriate rate of return. [That rate of return is measured gross of depreciation because we are estimating the effect of investment in GDP, and GDP itself is measured inclusive of depreciation.]

The specific point that I want to make in the present section is that, as equation (2) tells us, the relevant rate of return is precisely the rate of return that generates capital’s share, as measured in the traditional representation. That is to say, the whole return to reproducible capital divided by the whole reproducible capital stock.

When we divide the GDP of a country into only 2 parts, we pretty much have to aggregate land along with reproducible capital. The easy way to deal with this is to separate “basic land” (call it A) from the rest of capital (what we call reproducible capital, including improvements to land, which are counted as investment in the national accounts). Doing this, we can reformulate the traditional approach as:

$$(3) \quad \frac{\Delta Y}{Y} = S_L \frac{\Delta L}{L} + S_K \frac{\Delta K}{K} + S_A \frac{\Delta A}{A} + \frac{R}{Y}.$$

Here  $(\Delta A/A)$  is equal to zero, but the term  $\Delta A/A$  has meaning because attached to it is the share of GDP ( $S_A$ ) that goes to the remuneration of the land factor. Here we will take  $S_A$  to be .04. We will use three alternative assumptions for the values of  $S_K$  and  $S_L$ , respectively: (i)  $S_K = .04$  and  $S_L = .56$ ; (ii)  $S_K = S_L = .48$ ; or (iii)  $S_K = .56$  and  $S_L = .40$ .

Thus, reproducible capital’s contribution to growth will be .0144 ( $=.48 \times .03$ ) under the first set of assumptions and .012 ( $=.40 \times .03$ ) and .0168 ( $=.56 \times .03$ ) under the second and third sets of assumptions.

## RATES OF RETURN ARE IMPLICIT IN THE MECHANICS OF GROWTH

We have already introduced enough component parts to be able to show, quite simply, how a growth process implies (or perhaps better, has hidden within itself, a real rate of return to reproducible capital). Assume an economy that is growing at  $g$  percent per year, with reproducible capital receiving a fraction  $\underline{a}$  of its GDP, and with gross investment accounting for the fraction  $\underline{s}$  of GDP. If the depreciation rate is  $\delta$ , then net investment ( $=\Delta K$ ) is equal to gross investment minus depreciation.

$$(4) \quad \Delta K_t = \underline{s}Y_t - \delta K_{t-1}.$$

That is to say, gross investment ( $\underline{s}Y_t$ ) serves to cover the depreciation of the old capital stock, plus the current increase in that stock.

$$(4a) \quad \underline{s}Y_t = \delta K_{t-1} + \Delta K = \delta K_{t-1} + \frac{\Delta K}{K_{t-1}} \cdot K_{t-1}$$

$$(4b) \quad \underline{s}Y_t = (\delta + g)K_{t-1}.$$

This last equation builds in the notion of growth equilibrium, with capital growing at the same rate ( $g$ ) as output. This says that last period’s capital stock is this year’s gross investment divided by  $(\delta + g)$ .

Here we can get directly to the gross-of-depreciation rate of return  $(\rho + \delta)$ .

$$(5) \quad (\rho + \delta) = \frac{\text{Return to Reproducible Capital}}{\text{Stock of Reproducible Capital}} = \frac{\underline{a} Y_t}{\underline{s} Y_t / (\delta + g)}$$

$$(5a) \quad (\rho + \delta) = \underline{a}(\delta + g) / \underline{s}$$

$$(5b) \quad \rho = [\underline{a}(\delta + g) / \underline{s}] - \delta.$$

Table 2 elaborates on this result for a range of values of the key parameters. Our baseline case has GDP growth occurring at 3% per year, gross investment equal to 20% of GDP, reproducible capital receiving a return equal to 48% of GDP, with a depreciation rate of 3% in such capital. This package

of assumptions yields a gross-of-depreciation rate of return ( $\rho+\delta$ ) of 16.8% (not shown in the table) and a net rate of return—the object of our interest—of 12.8% (middle figure of Panel A).

Panel A explores how this “built-in” rate of return changes as one modifies the assumptions about the rate of depreciation and the share of reproducible capital. This panel reveals that the rate of return is modestly affected as the depreciation rate varies from 3 to 4 to 5 percent per year, becoming higher with higher depreciation rates. The effect of changing reproducible capital’s share from .40 to .48 to .56 is somewhat more pronounced. It is interesting to note, however that all but two of the calculated net rates of return in the Panel A lie between 10% and 15.6%.

**TABLE 2: RATES OF RETURN IMPLIED BY GROWTH SCENARIOS**

<b>Panel A: Varying rates of depreciation and capital’s share in GDP</b>			
Share of Reproducible Capital in GDP	Rate of Depreciation		
	.03	.04	.05
	Net Rate of Return ( $\rho$ ) under equilibrium growth		
.40	9%	10%	11%
.48	11.4%	12.8%	14.2%
.56	13.8%	15.6%	17.4%
Gross investment = .20 $\times$ GDP			
Rate of GDP growth = .03			
<b>Panel B: Varying Rates of Depreciation and the Share of Gross Investment in GDP</b>			
Gross Investment $\div$ GDP	Rate of Depreciation		
	.03	.04	.05
	Net Rate of Return ( $\rho$ ) under equilibrium growth		
.15	16.2%	18.4%	20.6%
.20	11.4%	12.8%	14.2%
.25	8.5%	9.4%	10.4%
Rate of GDP growth = .03			
Return to reproducible capital = .48 $\times$ GDP			
<b>Panel C: Varying Rates of Depreciation and the Rate of GDP Growth</b>			
Rate of GDP Growth $g$	Rate of Depreciation		
	.03	.04	.05
	Net Rate of Return ( $\rho$ ) under equilibrium growth		
.02	9.1%	10.4%	11.8%
.03	11.4%	12.8%	14.2%
.04	13.8%	15.8%	16.6%
.05	16.2%	17.6%	19.5%
Return to Reproducible capital = .48 $\times$ GDP			
Gross Investment = .20 $\times$ GDP			

Panel B shows the sensitivity of the rate-of-return calculation to changes in the rate of gross investment, together with the rate of depreciation. Here the sensitivity to changes in the depreciation

rate is still modest, but the rate of return responds quite strongly to changes in the rate of gross investment. It is pretty obvious that this should be so, since the formula for generating the capital stock as a multiple of GDP shows that capital stock will be proportional to the share of investment in GDP. Note, however, that all but two of the net rates of return shown in panel B lie between 9.4% and 18.4%.

Panel C of Table 2 shows how the results are modified if we change: a) the rate of depreciation and b) the rate of GDP growth. Here the sensitivity appears to be quite strong to changes in  $g$ . This is to be expected. Note that the rate of investment is being held constant at 20% throughout this panel. A higher rate of growth coming from a given rate of investment is best explained by a higher rate of real cost reduction (increased total factor productivity). Such increased productivity is known to result in higher overall returns, typically to all factors of production. To conclude on Panel C, note that all but two of the rates of return reported there lie between 10.4% and 17.6%.

### WHAT IF WE DON'T HAVE EQUILIBRIUM GROWTH?

In this tumultuous world, some readers might be troubled by the idea of a set of calculations that are based on the convenient assumption of equilibrium growth—that is, of a situation in which the country's GDP and its stock of reproducible capital are growing at the same rate. Fortunately, it is easy to correct for this situation. From equation (4), we know that

$$(6) \quad \frac{\Delta K_t}{K_{t-1}} = s \frac{Y_t}{K_{t-1}} - \delta.$$

Previously, we replaced  $\Delta K_t/K_{t-1}$  by  $g$  (= the rate of growth of GDP), assuming that capital and output were growing at the same rate. Now we simply replace  $\Delta K_t/K_{t-1}$  by  $g + \underline{e}$ , which allows for the capital stock to be growing faster ( $\underline{e} > 0$ ) or slower ( $\underline{e} < 0$ ) than output.

In reality, it is quite plausible that capital will sometimes grow systematically faster than output, and sometimes slower for a substantial period of time. For  $\underline{e} > 0$ , we have the fact that in most low-income countries, the ratio of capital to output is lower than in most advanced countries. Thus it is reasonable to believe that as a long-run tendency in the process of development, the rate of growth of capital might be a point or two higher than that of GDP. On the other hand, when a country is enjoying a spurt of growth due to very rapid real cost reduction (= TFP increase), without a big increase in the saving rate, we can expect output to be growing a point or two or three faster than GDP. Finally, we have cases like those of China and the other "Asian Tigers" (Taiwan, Korea, Thailand, Malaysia). Here very rapid growth was accompanied by huge investment rates (reaching over 40% of GDP in China's case). Here it is almost certain that, in spite of the high rates of GDP growth of these countries in their growth-boom periods, capital was almost certainly growing significantly faster than output.

Table 3 has the purpose of showing how rates of return respond when we have divergences between the rates of growth of capital and output.

In Panel A of Table 3 we examine the case of the ratio of capital to output gradually rising through the process of development. It seems reasonable that this would entail a higher than "normal" rate of gross investment, so Panel A allows for investment rates varying from 20 to 25 or 30 percent. Again we find a significant concentration of calculated rates of return—all but two cases lie between 9.4 and 15.2 percent.

**TABLE 3: RATES OF RETURN WHEN CAPITAL GROWS FASTER OR SLOWER THAN OUTPUT**

<b>Panel A: Moderately Higher Investment Rates With "Normal" Growth (long-term trend case)</b>			
Investment Rate (s)	e = "excess" rate of growth of capital stock		
	.01	.02	.03
	Net Rate of Return (ρ)		
.20	12.8	15.2	17.6
.25	9.4	11.4	13.3
.30	8.8	10.4	12.0
Assumed: return to reproducible capital = .48 GDP :rate of growth of output = 3% :rate of depreciation = 4%			
Based on the formula: $\rho = [a(g+e+\delta)/s] - \delta$			
<b>Panel B: Spurts of Output Growth Driven By Productivity, With "Standard" Investment Rate</b>			
Rate of GDP Growth (g)	e = "excess" rate of growth of capital stock		
	0	-.01	-.02
	Net Rate of Return (ρ)		
.03	12.8%	10.4%	8.0%
.04	15.2%	12.8%	10.4%
.05	17.6%	15.2%	12.8%
.06	20.0%	17.6%	15.2%
Assumed: return to reproducible capital = .48 GDP :investment rate = .20 :rate of depreciation = .04			
Based on the formula: $\rho = [a(g+e+\delta)/s] - \delta$			
<b>Panel C: High Growth Rates Together With High Investment Rates (Asian Tiger Case)</b>			
Rate of GDP Growth	e = "excess" rate of growth of capital stock		
	0	-.01	-.02
	Net Rate of Return (ρ)		
.06	9.7%	11.1%	12.5%
.08	12.5%	12.8%	15.2%
.10	15.2%	16.6%	17.9%
Assumed: return to reproducible capital = .48 GDP :investment rate = .35 :rate of depreciation = .04			
Based on the formula: $\rho = [a(g+e+\delta)/s] - \delta$			
<b>Panel D: Very High Growth Rates Together With Very High Investment Rates (Chinese Case)</b>			
Rate of GDP Growth	e = "excess" rate of growth of capital stock		
	.02	.04	.06
	Net Rate of Return (ρ)		
.08	10.9%	13.1%	15.2%
.10	13.1%	15.2%	17.3%
.12	15.2%	17.3%	19.5%

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Assumed: return to reproducible capital = .48 GDP  
:investment rate = .45  
:rate of depreciation = .04

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In Panel B we explore the case of rapid output growth largely propelled by real cost reduction (TFP improvement). In this case output grows more rapidly than the capital stock ( $\underline{e} < 0$ ). Note that a declining capital stock (relative to output) implies a lower rate of return. Recall that our table deals with a given share of capital in the nation's GDP. If the capital stock is declining relative to output, that means that last period's capital stock is larger relative to today's return to capital, than would be the case with a constant ratio of capital to output. Today's share of GDP going to capital is thus spread over a larger last-period capital stock, resulting in a lower rate of return. Note that in Panel B, we have all but two of the calculated rates of return lying between 10.4% and 17.6%.

Panel C tries to simulate the Asian Tigers case—high growth rates together with a high rate of investment (equal to 35% of GDP). This has a surprisingly moderate effect on rates of return, with all but two of the cells in Panel C lying between 11.1% and 16.6%. I suspect that the Asian Tigers' actual rate of return was higher than is shown here, and that the reason for that was a return to reproducible capital accounting for more than 48% of GDP. But I do not want to exaggerate rates of return in the present paper—the results are high enough to be surprising, even when conservative assumptions are being made. Moreover, later explorations will result in even more surprising rates of return, again under quite conservative assumptions.

Panel D is designed to simulate the case of China, with its enormous ratio of investment to GDP. Under the assumption ( $\underline{s} = .45$ ), it seems reasonable to allow for capital's growth rate to exceed that of GDP by even more than we contemplate in Panel C. Thus, Panel D incorporates the possibility of capital's growth rate being 4 or even 6 percentage points higher than that of GDP. Once again, we find a notable concentration of calculated rates of return. All but two of them lie between 13.1% and 17.3%.

## ALLOWING FOR INFRASTRUCTURE INVESTMENT

In this section we explore the consequences of taking account of the fact that many public sector investments do not produce an income stream in the form of cash. This is not to say that they are not worthwhile—roads, bridges, the judicial system, the public administration all have important roles to play in a functioning modern society. But their economic benefit lies in increasing the productivity of other factors of production, or adding to the utility of consumers, rather than generating a cash flow of their own.

So when we measure the profits, interest and rents generated by an economy, these returns accrue to (and reflect the marginal productivity of) investments other than these “infrastructure”<sup>2</sup> portions of the capital stock.

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<sup>2</sup> I am not happy with the term infrastructure in this connection, but have found no easy substitute for it. What I am aiming at is to divide public investments into two big groups -- those that really represent business investment, but with businesses in the public sector (like Chile's Codelco, Mexico's Pemex, plus many public sector electricity, gas and water companies) on the one hand, and on the other hand those that yield absolutely no revenue (like the buildings housing public administration and free public schools) or very minor receipts (like national parks and museums that charge modest admission fees). The first group

It is obviously quite a task to separate out these non-revenue-generating investments from the others that do yield an income stream, but it should be feasible to reach a reasonable division in any given country. (The money-making public enterprises usually keep standard business accounts, publish annual reports, etc.) For our purposes in this section, we are seeking a rough idea of the likely order of magnitude of the share of infrastructure investment in a typical developing country's economy. To do this I draw upon a study by Everhart and Sumlinski,<sup>3</sup> in which they present a breakdown of total investment into "private" and "public" categories for 63 developing countries. They show shares of public investment in GDP that range to over 20%, and shares of public investment in total investment that range to over 50%. In more than half of the countries covered, public investment ranges between 5 and 10 percent of GDP and between 25 and 50 percent of total investment. Our decision was to consider the lower bounds of these ranges to represent the nonremunerative portion of public investment, the idea being that all countries have roads and schools and public buildings, and that the countries that beyond this also have money-making public enterprises will reveal this in higher fractions of GDP and of total investment being devoted to public investment.

The end result of all of this is that in our "standard" example, where total investment is equal to 20% of GDP, we assign one quarter of this to "infrastructure". This enables us to calculate the average rate of return to reproducible capital in "remunerative" investment (both private and public) simply by dividing our previously calculated rate of return of 12.8% by .75. This reflects that the income we are counting in the numerator is in fact accruing to only 75% of our previously calculated capital stock.

Table 4 replicates two panels from Table 2, calculating the return to remunerative investments rather than the return to the total capital stock. It is easy to see that the "center of gravity" of these estimates moves from the 10-15% range to the 15-20% range. But that is just the beginning. In the next section we turn to the special case of investment in residential housing.

## **DEALING WITH INVESTMENTS IN RESIDENTIAL HOUSING**

There are several reasons why residential housing should be treated separately in an exercise like this. In the first place, a goodly share of such housing is owner-occupied; on this portion the makers of a country's national accounts introduce an "imputed rent". Rarely does that rent imply a real rate of return (on housing investment) greater than 6% per annum. Secondly, rates of return implied by the ratio of rents to house values tend to be quite low. A long-time rule of thumb was that monthly rent should equal 1% of house value. This was often interpreted as covering 1-2% for taxes, 1-2% for maintenance, 1% for insurance, and 2-3% for depreciation, with 6% representing the net real rate of return. But today one often finds free-market monthly rents in the range of 1/2 percent of the value of the dwelling. This can be rationalized by the owners expecting a good part of their return to come in the form of rising real values of their properties (negative depreciation = appreciation).

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should be lumped together with private sector investments -- they are the money-making part of the story. The second group should be separated out; and it is to this group that I am referring when I here use the term "infrastructure investments."

<sup>3</sup> Everhart, Stephen and Mariusz A. Sumlinski, 2001, Trends in Private Investment in Developing Countries: Statistics for 1970-2000 and the Impact on Private Investment of Corruption and the Quality of Public Investments, International Finance Corporation Discussion Paper No. 44, Washington, DC: The World Bank.

**TABLE 4: RATES OF RETURN TO REMUNERATIVE INVESTMENTS**

Panel A: Varying rates of depreciation and capital's share in GDP			
Share of Reproducible Capital in GDP	Rate of Depreciation		
	.03	.04	.05
	Net Rate of Return ( $\rho$ ) under equilibrium growth		
.40	12%	13.3%	14.7%
.48	15.2%	17.1%	18.9%
.56	18.4%	20.8%	23.2%
Gross investment = .20 $\times$ GDP Rate of GDP growth = .03			
Panel B: Varying rates of depreciation and the rate of GDP growth			
Rate of GDP Growth $g$	Rate of Depreciation		
	.03	.04	.05
	Net Rate of Return ( $\rho$ ) under equilibrium growth		
.02	12.1%	13.9%	15.7%
.03	15.2%	17.1%	18.9%
.04	18.4%	21.1%	22.1%
.05	21.6%	23.5%	26.0%
Return to Reproducible Capital = .48 $\times$ GDP Gross Investment = .20 $\times$ GDP			

But the national accounts do not measure this as part of the return to capital (profits, interest, rents). So in this case the measured return turns out to be much less than 6%. Third, in most countries the government engages in special housing projects for the poor and often also the not-so-poor. These units pay rents, but usually at a rate well below a standard market level, implying a real rate of return well below 6%.

The end of this story, for us, is that when we impute a 6% measured real rate of return to residential housing, we are probably erring on the upward side. From the point of view taken in this paper, this is a conservative assumption—if we imputed a 3 or 4 percent rate of real return to housing investment, we would end up with even higher implied rates of return to general business capital than the ones we are about to calculate.

To build a capital stock of residential housing we take housing investment to equal 3% of GDP (typically a conservative assumption) and build its capital stock by the formula  $K_h = .03Y/(g+\delta_h) = .03Y/((.03+.02) = .6Y$ . A 6% net real return on this capital stock would yield net income equal to  $.036Y$ .

To get the implied net rate of return to non-infrastructure, non-housing capital, we go through the following steps:

- i) Total Stock of Reproducible Capital  
=  $.2Y/((.03+.04) = 2.857Y$
- ii) Total Stock of Remunerated Capital

$$= .75 \times 2.857Y = 2.143Y$$

iii) Total Stock of Housing Capital  
 $= .03Y / (.03 + .02) = .600Y$

iv) Total Stock of "Business Capital"  
 $2.143Y - 600Y = 1.543Y$

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v) Total Return to all Capital = .480Y

vi) Total Depreciation on All Remunerated Capital  
 $.04 \times 2.143Y = .086Y$

vii) Net Return to all Remunerated Capital  
 $.480Y - .086Y = .394Y$

viii) Net Return to Housing Capital  
 $.06 \times .600Y = .036Y$

ix) Net Return to "Business Capital"  
 $.394Y - .036Y = .358Y$

x) Rate of Return on "Business Capital"  
 $.358Y \div 1.543Y = 23.2\%$

We can re-use most of the above calculations if we stick to our "standard" assumption of a depreciation rate of 4% on the overall capital stock. **Changing the share of reproducible capital in GDP to .40 we get:**

v) Total Return to all Capital = .400Y

vi) Total Depreciation on all Remunerated Capital = .086Y

vii) Net Return on all Remunerated Capital = .314Y

viii) Net Return on Housing Capital = .036Y

ix) Net Return on "Business Capital" = .278Y

x) Rate of Return in "Business Capital"  
 $.278Y \div 1.543Y = 18.0\%$

Now, changing the share of reproducible capital to .56, we get:

v)	Total Return to all Capital	= .560Y
vi)	Total Depreciation on all Remunerated Capital	= .086Y
vii)	Net Return on all Remunerated Capital	= .474Y
viii)	Net Return on Housing Capital	= .036Y
ix)	Net Return on "Business Capital"	= .438Y
x)	Rate of Return on "Business Capital"	
	.438Y ÷ 1.543Y	= 28.4%

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To explore the impact of changing GDP growth on the rate of return to "business capital," we have to go through all ten steps. To remain on the conservative side, we will do so under the assumption that the return to reproducible capital is 40% of GDP. In Table 2, this assumption, with a 4% overall depreciation rate, yields a rate of return to all reproducible capital equal to 10%. Our base case here is the one yielding an 18.0% return to "Business Capital". That is built on the assumptions of  $\delta = .04$ ,  $g = .03$ ; return to reproducible capital =  $.40 \times \text{GDP}$ ; Investment =  $.20 \times \text{GDP}$  (see first case treated on previous page).

Next, we maintain all of these assumptions but one, making the rate of growth ( $g$ ) equal to .02. Now we have

i)	Total Stock of Reproducible Capital	
	= $.2Y / (.02 + .04)$	= 3.333Y
ii)	Total Stock of Remunerated Capital	
	= $.75 \times 3.333Y$	= 2.500Y
iii)	Total Stock of Housing Capital	
	= $.03Y / (.02 + .02)$	= .750Y
iv)	Total Stock of "Business Capital"	= 1.750Y
v)	Total Return to all Capital	= .400Y
vi)	Total Depreciation on all Remunerated Capital	
	$.04 \times 2.500$	= .100Y
vii)	Net Return on all Remunerated Capital	= .300Y
viii)	Net Return to Housing Capital	
	$.06 \times .750Y$	= .040Y

- ix) Net Return on “Business Capital” = .260Y
- x) Rate of Return on “Business Capital”  
=  $.260Y \div 1.750Y$  = **14.8%**

Now we raise the GDP growth rate (g) to 4%, and repeat the exercise:

- i) Total Stock of Reproducible Capital  
=  $.2Y / (.04 + .04)$  = 2.500Y
- ii) Total Stock of Remunerated Capital  
=  $.75 \times 2.500Y$  = 1.875Y
- iii) Total Stock of Housing Capital  
=  $.03Y / (.04 + .02)$  = .500Y
- iv) Total Stock of “Business Capital”  
 $1.875Y - .500Y$  = 1.375Y
- v) Total Return to all Capital = .400Y
- vi) Total Depreciation on all Remunerated Capital  
 $.04 \times 1.875Y$  = .75Y
- vii) Net Return on all Remunerated Capital = .325Y
- viii) Net Return to Housing Capital  
 $.06 \times .500Y$  = .030Y
- ix) Net Return on “Business Capital” = .275Y
- x) Rate of Return on “Business Capital”  
=  $.275Y / 1.375Y$  = **21.5%**

Needless to say, all these rates would be higher if we had assumed that the return to reproducible capital was .48Y or .56Y, (the alternative assumptions we previously explored).

The conclusion to be drawn, which I believe to be inescapable, is that business capital, in most developing countries, receives a very substantial rate of return. This is a **fact** that, in my opinion, has not been fully “digested” by the economics profession. Obviously, if it were easy for anybody (foreigner or local national, insider or outsider) to put down some capital and readily gain a real rate of return of 20% or more, we would see lots of money flowing into those opportunities and the rate of return would be bid down.

Yet the rate of return **is there**. The national accounts do not exaggerate returns in capital (even implicitly). If anything, they understate them. So there is something of a mystery here, to be delved into. Surely some of this measured return represents “monopoly profits”, which are not properly part of the true return to capital, but are hard to disentangle from ordinary profits. A further part of the

high measured return to business capital surely represents “inframarginal investments”—that is, investments with individually high returns which are exploited in any given time period, but that are not marginal investments. The image here is that there are probably some few investments each year that turn out to have real yields of 50, 40, and 30 percent. These yields contribute to a high average rate of return, but this does not mean that adding to the stock of investible funds would lead to any (or much) of that incremental money being invested in items of super-high yield (these opportunities being so attractive that they are exploited anyway, with or without extra funds being placed in the market). Still, there is evidence that at least in some developing countries, real yields on business capital in excess of 20% prevail year after year after year—suggesting at the very least either that important new “inframarginal” opportunities keep coming onto the scene year after year, or alternatively, that the inframarginal aspect is not a big part of the story, and that a lot of business capital keeps earning very high real rates of return. Finally, there is the possibility that these high rates of return are really there, but require a degree of local knowledge and “savvy” that is hard for outsiders to replicate. Perhaps outsiders do put up money, and it truly yields 20% or more, but foxy locals manage to cream off enough of this return (even quite legally) so that the investment no longer seems very attractive to foreigners.

The above are merely speculations on my part—they are one person’s stab at potential **answers** to the puzzle of how such high measured rates of return can exist and persist. They are not put forward as the **true answers**. My main purpose here is to call attention to the **facts** of the case and to the **puzzle** that those facts create for us and others to try to answer.

A final word about the facts. The numbers that I used in the examples in this paper delineate what I would consider a very reasonable range. It is hard to imagine a situation in which the real rate of depreciation on the total reproducible capital stock of a sizeable country is outside the range between .03 and .05. Likewise, in most countries the ratio of gross investment to GDP actually **does lie** within the range of .15 to .25.<sup>4</sup> Finally, it is hard to imagine a sizeable country in which the gross return to reproducible capital was less than 40% or more than 56% of its GDP. (Note that after depreciation a gross return of 40% of GDP turns into a net return of less than a third of GDP, and that a gross return of 48% of GDP turns into a net return of less than 40% of same.) Overall, the assumed “packages” of numbers seem to form a sort of cage which hems us in from all sides.

There is every reason for us and others to proceed down a more time- and resource-consuming route, of building up direct time series on the real capital stocks and real returns to capital of different classifications, for as many countries as we can. These are useful not only in order to generate more precise results for particular countries, but also to reassure people of the reasonableness of the numerical assumptions made in studies like this one. But in the meantime, the exercises carried out in this paper present, I am sure, a broad picture quite similar to the one that will emerge from more careful study.

#### **DEALING WITH R&D AND OTHER “HIDDEN INVESTMENTS”**

A pharmaceutical company spends \$100 million on research seeking a better treatment for diabetes; a restaurant opens a new campaign by blanketing its neighborhood with advertising about the

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<sup>4</sup> In Everhart and Sumlinski’s study (op. cit.) the rate of gross investment to GDP lay between .15 and .25 for 37 out of 63 countries, and between .12 and .30 for 53 of them.

experience and honors of its new chef; an existing firm manages to disguise as an expense the costs of leveling and preparing the site for its new headquarters. From an economic point of view all these costs represent investment—outlays in the current period aimed at generating or supporting an income stream that will flow over a number of future periods. Conceptually, they should all be capitalized, with the capital sum then being depreciated over the span of that future income stream. Legally, the first two are legitimately classed as expenses—the first because those expenses qualify as R&D, the second because advertising outlays are always expenses. Only in the third is it illegal to claim the outlays as a current expense.

But to estimate the true economic rate of return one should really reclassify all three outlays as investment, and at the same time augment the income of the firm by the same amount during the investment period. Many such operations occur in any national economy in a typical year, so when we are estimating rates of return, as in this presentation, we should be able to make adjustments so as to properly treat the outlays involved.

The needed adjustment entails three steps: first, to increase the GDP and the income received by capital by the amount of such outlays; second, to increase investment of the year by the same amount; and third, to depreciate that investment over time in an appropriate manner.

Assume that such expenses (of all kinds, legal and illegal) amount to 4% of a country's GDP in a typical year. To recalculate our base case we therefore augment our GDP figure from  $Y_0$  to  $1.04Y_0$ , our investment figure from  $.20Y_0$  to  $.24Y_0$ , and our income from capital figure from  $.48Y_0$  to  $.52Y_0$ . (Note:  $Y_0$  should be thought of not as just the GDP of a given year but as a whole time series, in our case growing at the rate of 3% per annum.)

Now we repeat our basic operations. The reproducible capital stock now becomes  $.24Y_0/(g+\delta)$ , in this case  $.24Y_0/(.03+.04)$ , and the return to reproducible capital becomes  $.52Y_0(1.04)$ . The gross rate of return is thus  $.52Y_0(1.04)/[.24Y_0/(.03+.04)]$ . This works out to a 15.8% rate of return compared with a 16.8% rate in our base case— $.48Y_0/[.20Y_0/(.03+.04)]$ . The calculated net rate of return would be 11.8% as compared to 12.8% in the base case.

It is likely, however, that these “new” types of investment depreciate more rapidly than the old, raising, say, the average rate of depreciation from .04 to .0425. This would change the calculated gross rate of return to  $.52Y_0(1.04)/[.24Y_0/(.03+.0425)]$ , which equals 16.34%. Its corresponding net rate of return is 16.34% minus 4.25%, or **12.09%**.

This exercise should be sufficient to dispel any doubts that making plausible adjustments for R&D and other “hidden investments” would not change the order of magnitude of our results in any important way.









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# ECONOMIC POLICY AND THE REAL EXCHANGE RATE

A POLICY REPORT SUBMITTED UNDER CONTRACT  
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# ECONOMIC POLICY AND THE REAL EXCHANGE RATE

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Arnold C. Harberger, 8283 Bunche Hall, UCLA, 405 Hilgard Avenue, Los Angeles, CA 90095-1477,  
Telephone: 310-825-1011, Fax: 310-825-9528, e-mail: [harberger@econ.ucla.edu](mailto:harberger@econ.ucla.edu).

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## 1. INTRODUCTION

The real exchange rate has been a key variable in discussions of economic policy for something like three decades. Present-day “real exchange rate economics” has had its main development only since about 1970. It had earlier reflections too, in somewhat inchoate form, but under different labels.

The most direct path to an understanding of this complex area of economics is to recognize the real exchange rate as one of a very few key macroeconomic variables—being in many cases absolutely essential for diagnosing and understanding the economic situation of a country. One could really call it an essential variable in all cases; but like many others it can be peaceful and quiescent for long periods of time, tending in such periods to be “off the diagnostician’s radar screen.” That changes dramatically however, in more turbulent times. Particularly acute are situations of large swings in the rate of capital flow into and out of a country, wide movements in the prices of a country’s principal export product or products, and, of course, situations of genuine crisis of confidence, with their attendant massive capital flight.

Today there is renewed interest in real exchange rate issues because of the recent upsurge of the prices of petroleum, copper and other primary products. Accordingly, I will frame this exposition mainly around that theme. However, this should not lead readers to overlook the many other sources of real-exchange-rate movements. Really, any and all forces that influence the demand and supply of foreign currency will impact the real exchange rate. And in some formal sense they all have the same potential power—in the sense that it is the size and direction of an upward or downward shift of the demand or supply of foreign currency that matters—not the specific source of that shift.

Here is a brief listing of the principal sources of variation in the demand and supply of foreign currency:

- a. international capital movements
- b. changes in import restrictions
- c. changes in export taxes and subsidies
- d. changes in productivity in the tradable-goods sector of the economy
- e. changes in productivity in the non-tradable sector of the economy
- f. changes in the world prices of a country’s principal export products
- g. major expansions of tradables supplies due, for example, to new mineral discoveries.

All of these forces impact either the demand or supply of foreign exchange in a country, and it is the real exchange rate that in the end, by incorporating all of them, determines their net effect.

I know of no better description of the role of the real exchange rate on a nation’s economy than this: **“The real exchange rate is the principal equilibrating variable of a country’s trade and payments; and as a result is also main operational determiner of a country’s comparative advantage.”** To see how this works, think of a peso country with a flexible exchange rate with the dollar. A capital inflow that is to be spent in the nontradable sector of the country’s economy will directly add to the supply of foreign currency (dollars) without directly adding to the demand, causing the peso price of the dollar to **fall**. A trade liberalization reducing import restrictions will add to the

demand for foreign currency and cause the peso price of the dollar to **rise**. Conversely, however, the reduction of an export tax will increase the supply of exports, leading to a fall in the price of the dollar.

As the price of the dollar moves up and down, it obviously impacts the profitability of all activities engaged in producing export (or exportable) goods, as well as those involved in the production of import substitutes. In the process, and without any particular fanfare, it ends up drawing a line between those tradables (export and import competing) activities that will be viable, and those that will not.

Large capital inflows and big export price surges have often led to a situation in which only a very few export products ended up being profitable—all the rest had their profitability squeezed out by the declining price of foreign currency. This is the phenomenon called “**Dutch Disease**,” a consequence of the suffering of the Netherlands’ traditional export activities in the wake of the drastic drop in the real price of foreign currency (the real exchange rate) that resulted when that country’s newly-discovered reserves of North Sea oil and gas were developed and massively exported.

The economics of Dutch Disease is simple and straightforward. The economic function of export industries is to produce foreign exchange; the economic function of import substitute activities is to **save** foreign exchange. When foreign exchange is scarce, the economic reward for producing and saving dollars is typically (and should be) pretty high. This gives a strong positive incentive to export and import substituting activities. However, when big capital inflows or oil and gas discoveries make foreign exchange super-abundant, it is quite natural that it should then be cheap in real terms. This means a low reward for the (other) export and import substituting activities— simply put, the dollars that the exporters produce and that the import substitutors save are no longer worth nearly as much as before. Activities that were once highly valuable to the economy now turn out to be of much lower priority, or even superfluous (in the cases of those activities that turn out to be non-viable at the new, lower real price of the dollar).

## 2. WHAT CAN BE DONE ABOUT DUTCH DISEASE?

In the first place, let us recognize that the things that **cause** Dutch Disease—big inflows of capital, great mineral discoveries, export price booms—are all bringers of and signals of prosperity for an economy. **They**, surely, are not properly considered as diseases. The disease part of the story is the unintended consequence of economic abundance—abundance that in this case takes the form of a big inflow of foreign exchange. It is the consequent reduction in the price of this newly-abundant foreign exchange that causes trouble for producers of tradable goods and services, and sometimes for the labor and other factors of production engaged therein. But even here one must note that the losses that are borne by these producers and factors are basically matched by the benefits that accrue to the demanders of tradable goods.<sup>1</sup>

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<sup>1</sup> The gain to demanders of tradables is measured by  $-T_0^d \Delta E$  and the loss to producers and factors engaged in their canceled by the positive consequences accruing to the initial demanders of tradables. If we start with a situation of a deficit in the balance of trade— $T_0^d > T_0^s$ —the benefits to demanders outweigh the costs to suppliers of tradables. [Recall the basic national accounting identity  $(T^d - T^s) = (M - X)$ , where M and X are the values of imports and exports, respectively.] Only when the country starts out—before the big foreign currency inflow—with exports greater than imports, will the real-exchange-rate repercussions of the initial disturbance entail a net economic cost (which in turn would have to be weighed against the

So when we think of “doing something” about Dutch Disease (DD), we should bear in mind that the whole “package” of which DD is a part is generally a big plus for the economy in question. Above all, policymakers should beware, in responding to DD, of killing the goose that laid the golden egg.

### 3. TRANSITORY VERSUS PERMANENT SHOCKS

One can think of Dutch Disease coming in response, say, to the discovery of a major oil field—one whose productive possibilities stretch out for decades ahead. On the other hand, a country may face a big price rise for its main export (which could be oil), arising from a serious interruption of supply in some other part of the world. Here we have one clear-cut example of a disturbance that we can think of as “permanent” and another of a disturbance that is highly likely to be transitory in nature.

To most of us, it seems quite reasonable that different policy responses might be appropriate in these two cases. It makes more sense to allow an economy to make a full adjustment to a permanent disturbance than it does in the case of a disturbance that looks to be only transitory. The reason is simple: economic adjustments typically carry with them a bundle of “adjustment costs”. In the case of a permanent shock, these are simply a price that has to be paid to get an important benefit—like the tuition and other costs of getting a college education. But in the case of a transitory shock, the economy faces two adjustment costs—one to accommodate the shock when it comes, the other to adjust back to “normal” once the transitory shock disappears. That is to say, the transitory shock carries two sets of adjustment costs, yet has a much shorter-lasting benefit than what I have called a permanent shock.

Hence it is quite natural for policymakers to think about ways of reducing or mitigating the adjustment costs involved in a transitory shock. One easy way to do this is to grant subsidies or other benefits in some or all of the activities that are negatively affected (i.e., those afflicted with Dutch Disease). This, however, is a path fraught with perils—the main risk being that such legislative benefits tend to come more easily than they go. If the disturbance is transitory, and the mitigating response is permanent or much longer-lived than the original disturbance, one gets a very unwholesome tradeoff—a “permanent” distortion added to the list of ill-suited economic policies, in exchange for a bit of soothing salve to ease a transitory pain. And please do not forget—subsidies and similar benefits to producers and/or factors of production in the nontradables sector are a benefit to them, but not to the economy as a whole. Just as with the change in the real exchange rate itself, there are demanders of tradables (or, more likely in this case, taxpayers) on the other side of the equation, bearing a cost.

I am quite ready to concede with respect to a subsidy that would offset a fraction of the fall in the price of foreign currency, for a period of time that would coincide with the period of Dutch Disease—that such a subsidy, if sensibly designed, would actually palliate the effects of the disease without

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benefits of the disturbance itself—e.g., a big oil-price rise, or mineral discovery, or capital inflow). the supply of tradables, measured in the same units.  $\Delta E$  (a negative number in this case) is the change in the price of foreign currency that comes as a result of the initial, underlying disturbance that we are analyzing (the capital inflow, or increment of production is measured by  $T^S \Delta E$ . Here  $E$  is the local-currency price of foreign currency (e.g., the peso price of the dollar),  $T_0^D$  is the initial, before-the-shock demand for tradables, measured in foreign currency (dollars in this case),  $T_0^S$  is export proceeds that started in motion the machinery that resulted in Dutch Disease). It is obvious, then, that if we start from an initial position where  $T_0^S = T_0^D$ , the negative consequences of the disturbance on the initial suppliers of tradables ( $T_0^S \Delta E$ ) will be exactly

bringing permanent harm to the economy (so long as it really only lasted the indicated time). But then we come to the issue of sensible design. What are the chances that, once the possibilities of subsidy were opened, that all affected parties would be dealt with equally and neutrally? Much more likely is a grand melee of political forces and counterforces, with the luckiest or most powerful claimants coming out with subsidies that maybe even more than fully offset the change in the real exchange rate, and with the unlucky ones maybe getting nothing at all. Here we would be dealing with a disturbing battery of distortions even during an allegedly short-run solution to a short-run problem. It would be even worse if the distortions persisted beyond the transitory scope of the problem.

#### **4. A RECOMMENDED SOLUTION—OFFSETTING THE INFLOW**

Compared with the type of distortive, ad hoc measure we have just discussed, the solution of offsetting the inflow has great appeal. It operates in the exchange market itself, introducing a new demand for foreign currency as an offset to a transitory increase in supply. Needless to say, the effect on the real exchange rate of an inflow of 10% of GDP, with an offset equal to half of that amount, will typically be only half as great as the effect of that same inflow without any countervailing offset.

Just as the inflows themselves can come either on the capital account (portfolio capital, direct investments foreign aid, emigrant remittances) or on the current account (world prices of exports rise, new export fields are developed); so the offsetting operations can take place under either of these two rubrics. On the capital account side, we obviously have the repayment of outstanding foreign indebtedness, which the country generally has the option to pay back ahead of schedule. Even if this option doesn't exist, a country's government can always build up investments abroad that yield an acceptable income stream. If the rate of yield of such investments matches the interest rate payable on the country's outstanding debt, it is a matter of virtual indifference whether to accumulate offsetting assets in this way, or to pay down the debt directly. Some might even argue that it is somewhat better to take the asset-accumulation route, as that leaves the country with a wider range of future options.

A second important capital-account area is the accumulation of assets in commodity "stabilization funds". A number of oil producing countries now have "oil funds" that aim at accumulating foreign assets when oil prices are high, and drawing them down in periods when oil prices are low. Chile has had reasonable success over many years now with its copper fund, that works the same way in response to ups and downs in the world price of copper. The use of such funds is made easier in cases where the government has special taxes on the proceeds of exports of the commodity in question, still easier if the rate of such a tax is calibrated to variations in the world price of the commodity in question, and, of course easiest to the degree that the revenue from exports of copper, oil, or other leading export commodities accrue directly to the government through a public enterprise such as Pemex in Mexico or Codelco in Chile.

In cases where the proceeds of export sales of the commodity in question accrue exclusively or predominantly to private-sector companies, or where there is no special export tax, government would have to find ways of raising the local currency funds to buy the dollars to accumulate foreign assets in times of high export prices. In all cases, when export prices are low, the government would have to find ways of adding to its spending (hopefully in ways that are insulated from the tendency for spending items to be self-perpetrating).

Closely related to such capital-account operations is the accumulation of additional international reserves by the Central Bank. This route will be considered in more detail in the next section. Suffice

it to say here that: a) such accumulations can indeed be, but are not automatically an offset, and b) the rate of yield on such assets held abroad can be an important determinant of how beneficial the accumulation of reserves is, as a matter of national policy.

The use of the current account of the balance of payments to generate offsets to the ups and downs of the world prices of major exports is something that has not been widely discussed, but deserves the attention of policymakers. The trick here is that a dollar increment in the demand for imports augments the demand for foreign currency in exactly the same way as an increase of a dollar in the demand for additional foreign balances. Thus, it is a pleasant truth, that times of high commodity-export prices are typically times of general prosperity in a country (in spite of Dutch Disease). They tend also to be times when more funds are available for local investment purposes. How fortunate, then, might be the opportunity to use some of those funds to buy dollars to import road-building machinery and other construction equipment, to meet accumulated demands for hospital equipment and supplies, and maybe even to augment the annual quotas of students sent abroad for graduate and other specialized training.<sup>2</sup>

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<sup>2</sup> Obviously, one should be thinking of the benefits and costs of such expenditures as well as their function in helping to offset a big inflow of dollars. If we think of the "benefit function" in the same way as we think of a demand curve (recall that demand price is in any event the basic measure of benefits in applied welfare economics), then we can say that for the purposes of offsetting inflows of foreign exchange, we are looking for items whose benefit functions are quite elastic.

Inelastic demand items are therefore very poor candidates for this offsetting role. Take petroleum imports (in a country which is not itself an oil producer). We know that the demand for petroleum is quite inelastic; otherwise total receipts from petroleum sales would go **down** when its world price went up due to a shortfall of supply). Hence, to use "free foreign exchange" to add to oil imports to be dumped on the current market would make little sense. Each 10% increase in imports would imply a much more than 10% drop in the incremental benefit. Of course, the curve would turn flat at the point where an incentive was created for storing the oil, but the net benefit would be very low (given the costs of creating those facilities).

Now consider investing in equipment with, say, a 20 year life. Here what one is buying is the present value of the future stream of benefits that an asset will produce. If we buy an asset a year ahead of time, and do nothing at all with it the first year, we still have 19 years of benefits in common with what we would get by making the investment next year. We lose a little by making the investment "too early", and it is that tiny amount that has to be matched by the extra benefit of offsetting the inflow of funds. Obviously, the longer lived is the capital equipment involved, the easier it is to justify varying its volume of imports as part of a policy of modulating swings in the real exchange rate. And, of course, the first-year benefits will not in fact be zero.

Something similar can be said about foreign training programs. Such programs typically deal with the most outstanding students in a field (in the country in question)—perhaps the top 1 or 2 percent, or the top 5 or 10 percent based on grades, test scores and other criteria. As a long-time practitioner in the training of such people, I can attest with some fervor that the benefits of training do not fall off perceptibly as one moves from one percentile to the next, according to standard criteria. There is a predictably big difference in subsequent performance as one moves from the top decile to, say, the middle deciles. There is virtually no perceptible, predictable difference in subsequent performance as one moves from one percentile to the next, and not a great difference as one moves from the top decile to the one immediately below it. This means that a country can feel quite easy about using its programs of foreign training as a sort of shock-absorber, expanding the list of entrants in times of abundant foreign exchange, and contracting it when dollars are scarce. Also, it can grant extensions of study times with relative ease in the case of abundant dollars.





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This paper consists of a series of notes on particular aspects of Central Bank policy, in matters where that policy entails operations in the foreign exchange market, or other (e.g., sterilization) activities that are linked to foreign exchange operations.

## 1. EARNING HIGHER RATES OF RETURN ON “EXCESS” FOREIGN RESERVE HOLDINGS OF THE CENTRAL BANK

In a significant share of cases in which a Central Bank acts to sterilize large purchases of foreign exchange, the result is an increase in its holdings of foreign currency to levels that are far higher than the amounts it would ordinarily want to hold as international reserves. The desirable amount of the latter can be thought of as being linked to the volatility of the sources of the country's regular flows of foreign exchange (e.g., export proceeds, foreign aid, capital inflows or outflows), and also to the country's vulnerability to capital flight. With regard to sources, the desirable level of international reserves is often thought of as being a certain number of months of the country's imports, more months when the sources are more volatile, fewer when they are more stable. With regard to capital flight, the idea is to protect the country's money supply from a potential speculative attack. Here the desirable reserve level can be thought of as being a certain fraction of M2 (or some other broad-money concept), the fraction being larger in cases where the risk of a speculative attack is considered to be larger. Since both considerations will typically enter into the determination of the desired level of a country's international reserves ( $IR^d$ ), one can think of this level as being linked both to the country's monthly imports and to its broad money supply.

The situation I am referring to is one where, for reasons unconnected with the above, the Central Bank has accumulated international reserves well above its “normal” desired reserves level. Typically such situations occur when the Central Bank is buying lots of foreign currency (say, dollars), and is sterilizing a significant part of these purchases.<sup>1</sup>

The typical result of a sterilizing operation by the Central Bank is that it pays interest on its own obligations (or forgoes interest, say, on government bonds) that it sells in the local market, while it receives interest on the incremental reserves that it acquires, say, in New York or London. Most often, the result is a significant loss for the Central Bank, as the rate of interest that it pays or forgoes in the local market typically is quite a bit higher than the rate it gets in its increased holdings of international reserves. The Central Bank losses (due to the difference in rates paid and received) are not only a source of pain in their own right. Additionally they pose a significant constraint on the Central Bank's use of sterilizing operations.

The purpose of this note is to urge that Central Banks consider sequestering their foreign holdings that are above and beyond their normal demand for international reserves ( $IR^d$ ), and treat them differently from standard international reserves. The purpose of treating them differently would be to earn higher interest or other returns on them, thus reducing (or maybe even eliminating), the Central

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<sup>1</sup> The purpose of sterilization is to prevent the country's exchange rate from appreciating “too much” in real terms. In the case of a fixed exchange rate, it entails reabsorbing some of the local currency (say, pesos) issued to purchase an increased flow of dollars from abroad, either by the Central Bank's selling bonds or other assets, or by its otherwise (say by raising reserve requirements) engineering restriction of bank credit. In the case of a flexible exchange rate, the Central Bank's baseline behavior would be not to intervene at all; this would lead to a sharp appreciation of the country's currency in the face of a sharp increase in the flow of dollars from abroad. If the Central Bank wants to limit the size of this appreciation, it enters the foreign currency market to buy dollars; to do this in a non-inflationary way it issues bonds, sells other assets, or acts in other ways to restrict bank credit. These latter moves represent sterilization in a flexible-exchange-rate setting.

Bank losses that usually accompany sterilizing operations. Insert text here. Insert text here.

As a background for this suggestion, I must point out that Central Banks' international reserves are usually invested in securities of high liquidity and extremely low risk—e.g., U.S. Treasury bills. These are ideal vehicles for the standard purposes of international reserves—to cover an unexpected shortfall in a country's foreign exchange receipts, or to stem a speculative attack on a country's currency. Thus, I am not questioning the wisdom of the use of high-liquidity, low-risk vehicles for the placement of a country's normal holdings of international reserves.

But what about holdings that are significantly above the normal, prudent level? Why should Central Banks feel constrained to hold these "excess" amounts in forms where their low yields are the source of painful Central Bank losses? I feel there is little reason to restrict these "excess" amounts to the same rigorous liquidity and safety rules that have become traditional with respect to "standard" reserve holdings.

My minimal suggestion would be that Central Banks suffering significant losses from sterilizing operations should seriously consider looking for higher yields on their foreign holdings **in excess** of the standard level of prudent international reserves,  $IR^d$ . These could consist of standard commercial paper, medium-term government bonds, stock-market index funds, etc. How far to go along the tradeoff curve between risk and level of expected reward is not for me (or any other outside observer) to say. That is for the country's own authorities to decide. But they should reach this decision realizing that, when large reserves holdings are generating big Central Bank losses, there are good reasons to seek higher returns on the fraction of those reserves that is above  $IR^d$ .

In conversing with central bankers on this issue, I have made the point that the endowment portfolios of major U.S. universities have quite reliably yielded real rates of return of 7% or more. These portfolios indeed carry a certain degree of risk, but no one thinks of them as being especially risky. In my view it would not be unreasonable for a Central Bank to allocate its holdings of foreign exchange, above and beyond  $IR^d$ , in a pattern that imitates the average of how Harvard, Yale, Princeton, Chicago and Stanford Universities invest their endowment. This is not meant as a piece of advice as to what might be best for a particular Central Bank; it is only intended to say that a University-style portfolio should not be arbitrarily ruled out of consideration, as the search for an appropriate portfolio is pursued.

## **2. CONSIDERING STERILIZED INTERVENTION IN THE CONTEXT OF AN EXCHANGE-STABILIZATION FUND**

In my policy report "Economic Policy and the Real Exchange Rate", I analyzed Central Bank intervention in the context of its reacting to an unexpected large inflow of foreign exchange. That is indeed a realistic situation, which many Central Banks have had to face. But it is not the only context that can be relevant. In this section, I will explore the case of a more "permanent" intervention policy by a Central Bank.

The easy way to formulate this problem is to visualize the Central Bank as setting up an Exchange Stabilization Fund, which then would intervene to smooth out fluctuations that are deemed to be transitory in nature, and to moderate (or eliminate) the real-exchange-rate "overshoots" that often

occur as an economy adapts to a large increase or decrease in the normal supply of foreign exchange flowing into the country.

One way to approach this problem is to think of an in-and-out operation, in which the Central Bank may be dealing not with a very short term “blip”, but with a sort of wave, or bulge, or cycle in the flow of foreign exchange to the country. This image leads me to take a somewhat different view from that expressed in the aforementioned policy report. There, one looked at a sterilized intervention as the purchase of an “excessive” inflow of foreign exchange—that purchase being financed by the sale of bonds or other assets by the Central Bank. The result was an expected loss by the Central Bank, period after period, as the interest received on the Central Bank’s above-normal holdings of international reserves fell short of the interest paid (or forgone) on the domestic-currency bonds sold by the Central Bank in the country’s own capital market.

When our focus is shifted to a stabilization fund, the above image is modified. Instead of a one-way street, we are looking at a two-way street. If the Central Bank incurs losses as it copes with an unexpected rise in the flow of foreign exchange to the country, it will quite clearly make profits as it deals, in a symmetrical way, with an unexpected fall in the same flow. In the latter, the operation would consist of selling dollars from its stabilization fund, and using the peso proceeds to buy back some of the local currency obligations it had previously issued (or simply sold, as in the case of government bonds.) So long as the interest rate paid or forgone in the local market exceeds the interest rate received on the Stabilization Fund’s holdings, this operation would entail a clear Central Bank profit.

Thus, one has a sense that, as far as interest rate differentials are concerned, the two-way street of a stabilization fund would sometimes produce losses, and other times produce gains, on individual “sterilized” foreign currency interventions.

In addition, there is the possibility of a stabilization fund yielding a genuine profit over time, as a result of a sequence of exchange-market interventions. These would stem from its dealings in foreign currency. If it buys dollars when the dollar is cheap in terms of real pesos, and sells when the dollar is expensive in the same terms, there should be real peso profit involved in a sequence of such operations over time. One should be careful not to put too much credence in this presumption, however, for it is based on the notion that the Stabilization Fund authorities are right most of the time. It does not contemplate cases in which dollars are bought when they are thought to be cheap, only to find that they later become even cheaper—reaching, say, a new permanent level far below what the authorities had in mind. But one thing can surely be said. This sort of risk becomes smaller, the wider is the “band” within which the real exchange rate is allowed to fluctuate without calling forth intervention.

A final note on the topic of Exchange Stabilization Funds concerns how they are financed in the first place. If they are financed from the beginning by the sale of bonds or other obligations in the local market, then, of course, there will be a loss (due to the interest rate differential) on the Fund’s average holdings of foreign exchange, once again calling attention to the wisdom of carefully weighing the risk-reward tradeoff when deciding on the appropriate portfolio composition of the Fund’s foreign asset holdings.

### 3. STERILIZED INTERVENTION AND THE “REFLUX” PHENOMENON

This section deals with a problem whose importance is small (often negligible) in developing economies that have not modernized very much, and which in particular have not developed strong capital-market linkages with the major financial centers of the world. What I specifically mean here by “strong capital-market linkages” refers to situations in which investors and financial institutions in the rest of the world respond readily to changes in the tightness and ease of the capital markets in the country in question. Even small rises in the general level of interest rates of the country would, under strong linkages, bring significant additional flows of foreign capital into the local markets.

The paradigm for “strong capital-market linkages” is the situation that exists among the major financial centers themselves. In these cases the linkages are fueled by the phenomenon of covered interest arbitrage. If the interest rate in New York is 5% (in dollars) and in Frankfurt is 4% (in Euros), there would seem at first glance to be a chance for German investors to gain, by shifting their balances to the New York market. But to do so would entail a risk that the exchange rate might change. That risk can be covered by selling dollars in the forward market—enough to bring the deposit proceeds (plus interest) back to Germany at the appropriate time. If the forward exchange rate is exactly the same as the spot rate, this will still yield an advantage of 1% per year, as a result of shifting the funds for Frankfurt to New York. However, this is not likely to be the situation in the real world. Why? Because people, taking advantage of the opportunity to gain by covered interest arbitrage, will bid up the forward exchange rate so that the dollar is worth 1% less, in terms of Euros, at a distance of one year. With arbitrage working “perfectly” in this sense, marginal investors would end up earning exactly the same, in “covered” operations, regardless of whether they keep their money in Frankfurt, or instead send it to New York, or to London, or to Zurich, etc.

Covered interest arbitrage works so well among the major financial centers that one can say, for practical purposes, where short term, low-risk funds are concerned, that these centers together form just one big “world capital market.”

If, in that market, the Federal Reserve were to engage in a sterilized intervention, buying Euros in order to offset a big inflow of foreign currency from some source (say, a big rise in the price received on U.S. exports of wheat), the likely initial result would be a rise in U.S. interest rates, as the Fed sold bonds as it sterilized part of the inflow. But this rise in interest rates would tend to draw funds in from abroad, the end result being either that enough funds would come in to bring the New York interest rate back down to where it started, or else, with less funds coming in, the financial market would build in a depreciation of the future dollar, by enough so as to offset any further arbitrage gain to foreigners from shifting their deposits to the United States.

A quick way to summarize the likely outcome of an attempt at sterilized intervention by the Federal Reserve is that a goodly fraction of the money that the Fed sent abroad in the hope of sterilizing an initial inflow would itself be offset by the “reflux” of money from foreign markets—this “reflux” being stimulated by the rise of New York interest rates brought about by the Fed’s sterilizing operation (say, sale of T-bills in the New York market).

One can quantify the reflux phenomenon with a reflux coefficient—the fraction of the amount the Central Bank sends abroad in an operation of sterilized intervention, which then returns to the country via new capital flows from abroad that are stimulated by the rise in local interest rates that the Central Bank’s operation has itself brought about.

For myself, I have no doubt that the reflux coefficient is big enough to worry the Federal Reserve, The Bank of England, and the European Central Bank, as they contemplate sterilizing operations. At the other extreme, it is unlikely that Madagascar, or Paraguay, or even China, have sufficiently close linkages with the world capital market for the reflux coefficient to be of any serious magnitude.

In between these extremes, I was able to watch, as Chile's ties to the world capital market developed: the reflux coefficient, initially negligible, grew over time so as to cause serious worries for the Central Bank. In the end, that bank for a time placed what amounted to a tax on inflows of financial capital, in order to reduce the reflux coefficient and make sterilized interventions more manageable.

A quick summary of this point would be that sterilized interventions work with maximum efficiency when the reflux coefficient is zero, and that they are totally impotent when the reflux coefficient is one. For most countries it is likely to be somewhere in between. But it is unlikely to be of any worrisome magnitude for most developing countries. Those with truly modern capital markets, however, should study carefully how international capital flows respond to movements between tightness and ease in their own market. One unexpected dividend of successful capital-market development may, in such cases, turn out to be a weakening of the capacity of the Central Bank to offset important ups and downs in the flows of foreign exchange arriving in the country.

#### **4. DEALING WITH INTERNATIONAL RESERVES THAT ARE "TOO HIGH" IN A NEW EQUILIBRIUM**

This section builds on the fact that when there is a "permanent" or long-lasting change in the regular flow of foreign exchange into a country, the end result will (or should) be an equilibrium in which the Central Bank no longer intervenes in the foreign exchange market. If, on the contrary, it continues to intervene, trying to prevent the real exchange rate from reaching its new equilibrium, the result will be that its reserves will keep on growing, period after period, with no end in sight so long as the underlying forces that determine the equilibrium real exchange rate do not themselves change.

Here, we consider that a Central Bank has intervened along the path from the old equilibrium (with a lower regular flow of foreign exchange) to the new equilibrium (with a higher regular flow). This intervention may have had the purpose of preventing or mitigating an "overshoot" of the real exchange rate, or it may simply represent a resistance to precipitous changes in the RER. For our argument the purpose does not matter; what is important is that the Central Bank has built up a large stock of reserves, and (perhaps because these are generating Central Bank losses) would much prefer for that stock to be smaller.

The key point to be made is that the flow equilibrium of the country's balance of payments will be basically the same, regardless of whether the Central Bank holds \$2 billion, \$1 billion, or \$500 million of international reserves.<sup>2</sup>

The problem we here pose for the Central Bank is the following: how to get from a full equilibrium with international reserves of \$2 billion, to a nearly-the-same full equilibrium with international reserves of \$1 billion?

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<sup>2</sup> Minor differences would exist because the interest income earned on the reserves themselves would be different in the three cases. But the main balance-of-payments items—exports, imports, normal capital flows, normal emigrant remittances—would presumably be the same and would produce substantially the same real exchange rate, as in all three cases the Central Bank is neither increasing or decreasing its level of reserves.

Three routes come immediately to mind. One is simply to allow the stock of reserves to move gradually from the higher to the lower level— say, by selling off \$200 million of reserves in each of five consecutive years. This would lead to a modest transitional fall in the real peso price of the dollar, but it would be quite modest compared to what would happen if the Central Bank tried to dump the full “excess” amount of \$1 billion on the market in a single year.

The second route is a close “twin” of the first. Instead of dumping foreign exchange on the market (which virtually implies a flexible exchange rate), consider instead expanding domestic credit via open market operations or some similar mechanism. This would be compatible with a fixed exchange rate but would not require one. The key feature here is that the credit expansion would itself generate new demands—for both tradable and nontradable goods, and the increment to tradables demand would have an essentially one-for-one reflection in a loss of international reserves. The mechanism involved here is that emphasized by the so-called monetary approach to the balance of payments. Bank credit rises by 100, accompanied by a rise in deposits of like amount. When the recipients of the credit spend that money, the part spent on tradables causes either increased imports or reduced exports or both. In all of these cases, it leads to an equivalent loss of international reserves by the Central Bank (necessarily with a fixed exchange rate; at its option [i.e., if it is willing to part with them] under a flexible rate). If 40 of the increment of credits is spent on tradables, that 40 disappears from both deposits and international reserves; the remaining 60 of new credits is spent on nontradables. As a result, the money supply is now larger by an amount of 60, and the result is an excess, in the local economy, of actual real cash balances ( $M_2^s / P$ ) over desired real cash balances ( $M_2^d / P$ ). These excess balances will be spent, not typically all at once, but quite certainly in a gradual pattern over time. As this process goes on, the part spent on tradables will again lead to a loss of foreign exchange reserves, and a reduction in the amount of undesired monetary balances. Thus, a Central Bank can in fact “create” incremental demand for tradables, almost at will, simply by expansionary monetary policy. This should not be inflationary, though it may lead to a transitory rise in the price level of nontradables. The big lesson of the monetary approach is that the mechanisms of direct spending of an increment to credit, plus the mechanism of the gradual spending of undesired real cash balances  $[(M_2^s / P) - (M_2^d / P)^d]$  will quite rapidly get rid of international reserves, without much impact on internal prices or interest rates.<sup>3</sup>

The third way of a Central Bank getting rid of undesired international reserves requires the collaboration of the government. This consists in augmenting government demand for tradable goods (i.e., shifting the government demand curve for tradable goods to the right) at such times as the Central Bank makes a plea in that direction. Usually there are items in a government’s budget that entail the use of foreign exchange, and these often can be expanded without such expenditures becoming wasteful. The Central Bank might find it easier to persuade the government to seek out such possibilities by helping to make bank credit available for the purpose (in a sense pursuing a course similar to the previous method, but in this case expanding bank credit in favor of the government rather than the private sector).

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<sup>3</sup> The well-known link between credit expansion and internal price rises comes, in a fixed-exchange rate setting, stems from countries taking defensive measures to prevent the loss of reserves—increasing tariffs, imposing import quotas or prohibitions, instituting prior deposits and/or licensing schemes on imports, etc. It is these measures that “bottle up” the inflationary force of an increased money supply within the economy, instead of letting the excess money ( $M^S - M^d$ ) escape through the balance of payments.

I believe that these three ways of working down an undesired excess of international reserves make it quite clear that no Central Bank has to feel it is simply stuck with a too-large holding of such reserves. There are, indeed, ways to get rid of them over time, without paying a heavy cost in terms of real exchange rate appreciation or price-level increase.









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# CAN WE IDENTIFY THE BASIC TOOLS NEEDED FOR POLICY ANALYSIS IN DEVELOPING COUNTRIES?

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Arnold C. Harberger, University of California, Los Angeles. This paper was prepared under the auspices of USAID, and subsequently presented at the January, 2007 meetings of the American Economic Association.

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# CAN WE IDENTIFY THE BASIC TOOLS NEEDED FOR POLICY ANALYSIS IN DEVELOPING COUNTRIES?

## INTRODUCTION

It is now a little more than six decades since I took my first graduate courses in economics (during 1946). Lots of things have happened over this period—crazy policy experiments, explosive inflations, devastating economic crises, commodity (especially oil) price gyrations, problems with drugs and migration. Through it all, economic research has marched ahead at a steady pace, and the “standard” curriculum of our graduate economics departments has steadily evolved. There can be no doubt that economists being trained today are exposed to a much more sophisticated set of theories, and in general to a much more formalized discipline than we saw in the late 1940s on through the 1950s.

I readily concede that this evolution has brought significant gains. Notable among them is the profession’s outgrowing its fascination with what I sometimes call “free-lunch” Keynesian thinking, which took a model which was quite apt for economies in which a quarter of the labor force and probably a similar fraction of the capital stock were unemployed, and applied it to a whole gamut of cases in which these key conditions did not prevail. Here was a case of a model which had reasonable applicability to one set of circumstances being applied very generally, most often in circumstances where, instead of adding to our insight and understanding, it clouded our vision and caused us to misread the signals that the economy was sending.

We have by now overcome that problem, but I and others are seriously worried about whether we have not fallen into different but analogous traps as we have moved ahead. I will give two examples here.

1. Many “representative consumer” models deal with the dynamics of an economy in which the representative consumer solves “his problem” of choosing how to divide his time between labor and leisure and his cash flow between consumption and investment over a sequence of periods (ranging from two to infinity). One key feature of most of these models is that the phenomenon of unemployment, as most of us understood it, simply does not exist—workers are “on their labor supply curves at all times”. How can such models help us understand, let alone deal with, the problems of cyclical and long-term unemployment that we observe in the real world? How can they help us understand cyclical fluctuations in general?
2. Most models embodying standard rational expectations assumptions end up predicting huge overshoots during the process of dynamic adjustment to shocks of one kind or another. One favorite example of mine posits a change in the rate of expansion of the money supply from, say, 10% to, say, 20% in a static economy with a fixed level of output (and assuming the economy’s resources are fully employed). The equilibrium rate of inflation in that economy moves, quite

clearly, from 10% to 20% per year as a consequence of this shock. The models I'm complaining about have economic agents immediately capturing and internalizing the shift of monetary policy—thus their real cash balances have to go down immediately to reflect their new expectation of a 20% rather than a 10% annual tax on their real cash balances. The time path of the price level, on semilog paper, is described by a straight line rising at 10% per year up to the point of the shock, then at that point taking a discrete jump upward, after which it follows another straight line rising at 20% per year. The time path of the rate of inflation is a steady 10% per year prior to the shock, plus a steady 20% per year after the shock, with a huge spike at the point of the shock, sufficient to cause an instantaneous rise in the whole price level. If we think in periods of a year, and start with a price level of 1.0 and a money supply of 1000 at the beginning of the year, a continuation of the old trend would bring the price level to 1.1 and the money supply to 1100 by the end of the year. But suppose that the equilibrium M/P goes down from 1000 to 800 as expected inflation moves from 10% to 20%. Now, by the end of the year of the shock, the “rational expectations” spike has to bring the price level to 1.5 (a money supply of 1200 divided by a price level of 1.5 will give us the real cash balances of 800 that puts the public on its demand function for real cash balances in the new situation). Thus in this case the models I am speaking of would have 50% inflation in the year of the shock, followed by 20% inflation thereafter. If the model were a monthly one of the same class, it would yield a price level of 1.267 (end of month money supply of 1013.3 divided by price level of 1.267 yields actual = desired real cash balances at the new level of 800). This implies inflation at a monthly rate of  $26 \frac{2}{3}$  percent (= an annual rate of 320%) for one month, followed by  $1 \frac{2}{3}$  percent per month (annual rate of 20%) thereafter.

This kind of model may serve a very modest purpose in helping to explain the phenomenon of overshooting and undershooting as the economy moves from one equilibrium to another. But it is so unreal in so many respects that it deserves not much more than a footnote in any attempt to explain the dynamic adjustment processes we observe in the real world. Of primary importance in such an explanation are the lags in economic agents perceiving and internalizing the message that a particular shock is “permanent” or at least long-lasting rather than transitory.

This brings me to a second but related complaint—this one concerning the allocation of classroom time in our graduate (and undergraduate) courses. A Ph.D. program in a quarter system will typically involve 3 courses per quarter, three quarters per year, for 2 years of classroom work. Classes usually meet 3 hours a week for 10 weeks in such a system. Thus we have 30 classroom hours per course, 18 courses per program, which adds up to 540 classroom hours in a typical Ph.D. program. To me, this signals a huge problem of time allocation. As I see it, there is simply no time for frills in any aspect of the program. We need to teach the fundamentals of economic processes, the fundamental skills of observing and diagnosing economic situations, the fundamentals of data analysis and hypothesis testing. What I fear is that by following novel trends too assiduously, we have ended up short-changing our students on many of these fundamental elements.

In what follows, I will try to give readers a sense of some aspects that I consider to be fundamental and that I feel are missed or grossly underemphasized in the training of a great many Ph.D. students, even those specializing in areas of policy economics. In presenting these “cases” I will make no attempt to give “equal time” to each of them. Where a short comment will suffice, that is what you will see; where a longer comment is needed or advisable, that will be given.

**1. THE CLASSICAL DICHOTOMY:** This represents the idea that we can, at least conceptually, think that an economy has a real equilibrium in which real quantities and relative prices are determined, and that in some sense “lives” out there, independent from elements on the monetary side of the economy. Like most economic abstractions (and most economic theory) this dichotomy oversimplifies the real world—but it is an incredibly useful oversimplification. To me, it is absolutely critical in making projections of supplies and demands, of relative prices and real wages, of industrial growth and decline. Nothing in the economic textbooks can help us predict Brazil’s or Turkey’s or Russia’s price level for 10 or 20 years hence, but we can reason sensibly about the time paths of their future real GDP, their future real wage level, their future real interest rate, their future real exchange rate, etc.

At another level the classical dichotomy comes into play as we find an economy facing a current disequilibrium (or need for fundamental adjustment) in its economic connections with the rest of the world. Often such disequilibrium calls for an adjustment of the country’s real exchange rate. The message of the classical dichotomy is that the new real equilibrium (toward which the economy is headed) is largely independent of its exchange rate system. If it has a flexible rate system, adjustment is likely to come more quickly, and often at a higher general price level. If it faces a fixed exchange rate system the dynamic process by which the new equilibrium is reached will be quite different, and the whole adjustment process slower, but the idea is that there is a “target” out there, which in real terms is substantially independent of the adjustment mechanism at work (within a family of adjustment mechanisms that do not themselves involve introducing new distortions into the price mechanism). That idea is a great boon to analysts struggling to interpret events and design policies in our complex world.

**2. THE NEED FOR RELEVANT NUMERAIRES:** Models of general equilibrium typically involve  $n$  commodities and  $n-1$  relative prices, the latter being expressed relative to  $p_n$ —the price of the numeraire good. In these models any good’s price or any index of prices can equally well serve as the numeraire, but in dealing with any real-world problem that is just a dumb idea. Imagine a statistical abstract measuring real wages in barrels of oil, or a nation’s GDP in terms of tons of copper. True—the real phenomena we observe would be no different, but in interpreting any observed movements, we’d have to spend at least half our time splitting up the real wages story into a part that reflected events in the world market for oil, and into another part that more basically reflected events in the labor market. Similarly, analyzing the movements of GDP measured in tons of copper, half our job would be separating these movements into a component reflecting happenings in the world copper market, and another component that more genuinely reflected the basic forces underlying GDP, growth of the labor force, changes in its quality, rate of real investment, the real rate of return on that investment, and changes in that economy’s total factor productivity.

There is no such thing as a perfect real-world numeraire, but those who have thought most about the problem have pretty much settled on two candidates that meet the criterion of feasibility and usefulness. These are first, a general index of prices of things consumed (CPI) and second, a general index of prices of things produced (GDP deflator) in an economy. Each of these has its own advantages and limitations, but both are meaningful, readily available and yield relative prices where movements don’t have to be laboriously “cleaned up” in order for us to make sense of the reality we’re looking at.

On the above two numeraires there is, I think, little disagreement. But then, I ask, how many graduate students are taught to always think in terms of real prices? How many time series on prices are

routinely presented to readers in real terms? In short, I think we have some distance to go in terms of helping people understand economic events by emphasizing (particularly where prices are concerned) the real side.

My biggest gripe, however, concerns the sluggishness of our profession in recognizing the great need for a second numeraire—an **index of the general price level of world tradables**. The need for such an index flows naturally from real exchange rate economics. What neater definition of a country's real exchange rate than "The number of that country's GDP baskets that it takes to buy one standard basket of world tradables?"<sup>1</sup>

**3. THE MONETARY APPROACH TO THE BALANCE OF PAYMENTS:** This approach really "reached" the profession in the early 1970s, but it was foreshadowed by earlier work, especially at the IMF, where the names of J.J. Polak, S.C. Tsiang, and R.A. Mundell all figure prominently. In my own perhaps simplified interpretation, the monetary approach really embodies the core of monetary theory. This consists of two propositions:

- iv. There exists at any one time in an economy a demand function for real monetary balances, in which the demand for, say,  $M2/p$  or  $M3/p$  depends on real variables—real income, real wealth, real interest rates, etc., plus the expected rate of inflation, which is also a real variable (because as a percentage tax on nominal balances, it also taxes real balances at the same rate, and because real interest rates are defined by nominal interest rates minus the expected rate of inflation). "Money demand" thus defined can be denoted generically by  $(M/P)^d$ . It is determined not by monetary policy but by "the public". On the supply side we have the nominal quantity of money  $M^s$ , which is at least to a degree determined by monetary authorities, through rediscount rates, open market operations, reserve requirements and the like. It is an absolutely key proposition of monetary theory that while  $M^s$  is determined or at least influenced by the monetary authorities,  $(M/P)^d$  is not determined by them but by the people.
- v. This leads to the second key proposition of the monetary approach: that when  $(M/P)^d$  differs from  $M^s/P$ , people will try to eliminate that difference. When their monetary balances are too large, they will try to bring them down by spending the excess (usually gradually over a period of time); and when the balances are too small, people will try to build them up, again usually gradually. In the process of spending excess balances, they will spend part on nontradables which will tend to raise their internal relative price, and part on tradables, which, with an exchange rate that is fixed or policy-determined (a la **tablita**) even in the short run, will lead to a loss of international reserves by the Central Bank. Likewise, a shortfall of  $(M/P)^d$  below  $M^s/P$  will lead in similar situations to an accumulation of international reserves. A corollary is that Central Banks can attract reserves by

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<sup>1</sup> I have long urged the creation of a price index of world tradables, preferably by the IMF. No one has yet told me it was not a good idea, but people in the IMF have stressed how long and painful is the task of effectuating a change in the content of International Financial Statistics. Maybe the answer is for some other department of the Fund to take on the job of calculating the index of world tradables prices, and letting the IFS incorporate it in its publications when it so chooses. If not the IMF, then some other entity (the Federal Reserve?, the European Central Bank?, the OECD?) should take the lead. I have long used, and published in various places, what I call the SDR-WPI. This takes a country's wholesale price index as referring predominantly to tradables prices. It then considers Japan's WPI (multiplied by a  $\$/¥$  exchange rate), the U.K.'s WPI (multiplied by a  $\$/£$  exchange rate), etc., etc., to be independent estimates of the "world price level of tradables", expressed in dollars. The SDR-WPI then weights these estimates with the weights that the IMF uses in constructing the SDR. My SDR-WPI series only begins at the point when the constituent currencies of the SDR were reduced to five—the Japanese Yen, the British Pound, the French Franc, the Deutschmark and the U.S. Dollar. Chained weighting changes are used to smooth the occasional changes in the Fund's weighting system for the SDR, and also for the introduction of the Euro in place of the franc and the Deutschmark.

putting on the monetary brakes, and can lose reserves by stepping on the accelerator—even without perceptible changes in interest rates and relative prices. These changes are likely to be present, but the big lesson of the monetary approach is that they typically do not carry the main weight. The mere presence of an excess or a shortfall between the demand for and the current supply of monetary balances is enough to trigger an adjustment process that is capable by itself of bringing about equilibrium.

**4. THE CONSOLIDATED BALANCE SHEET OF THE MONETARY SYSTEM:** This is a simple statistical artifact that considers the system that generates a broad concept of money like M2 and M3. Its liabilities consist mainly of broad money (e.g., the IFS's Money plus Quasi-Money); its assets are mainly Net Foreign Assets plus Credit to Government  $(M/P)_t^d$  plus Credit to the Private Sector. Other items enter, but they are not important for most problems of economic analysis or for classroom presentation. Consider how an inflationary policy impacts this balance sheet. Nominal Money ( $M^S$ ) is roaring ahead at 20%, 30%, or 50% per year, but people's desired **real** cash balances  $(M/P)^d$  are far less than they would be in a stable monetary environment, and probably less than they actually were—pre-inflation—in a real-world inflationary episode.

This reduction in desired real balances leads to an inflationary “equilibrium” in which is more or less equal to  $M_t^S / P_t$  as the economy moves through time. In this “equilibrium”, real monetary balances are significantly below their pre-inflation level. Hence, something on the asset side has to be squeezed also. Maybe there was a reduction in Net Foreign Assets (via loss of reserves of the Central Bank), though private banks will probably try to build up their foreign assets as an inflation hedge (or speculation). Government credit from the banking system is not likely to decline, especially in a phase of rapid monetary expansion, which usually entails the Central Bank (or the rest of the banking system) acquiring government paper period after period, to finance ongoing fiscal deficits.

The bottom line is that we have very good reason to expect that major inflationary episodes will end up involving a major squeeze of credit to the private sector (in real terms). The facts fully confirm this expectation. What is gratifying is that a simple, very basic approach to monetary analysis, based on the monetary approach plus the consolidated balance sheet, tells us that this is what we should expect, and at the same time gives us the tools to analyze how this process works, up to and including its dynamic evolution over time.

**5. RECOGNIZING DISEQUILIBRIUM:** Disequilibrium is not a pleasing word to most contemporary theorists. In fact, a great deal of the work of modern macrotheory has been to create complex dynamic models in which everything is in continuous equilibrium, the process being restarted as each new shock strikes the system. I admire the elegance of this approach but find in it little of the strength and robustness of T.W. Schultz's prophetic sense that the agro-economy in the United States and most other countries was in an almost continuous state of disequilibrium, with the shocks of technical advance and modernization, as well as the rise of real wages in other economic sectors, calling for a continuous stream of migration out of agriculture, together with a continuous buildup in the amount of human capital per remaining farmer. I also greatly admire Alfred Marshall's brilliant conceptual leap as he created the distinction between the long run and the short run. What was so neat about Marshall's short run was that it represented at one and the same time an equilibrium and a disequilibrium. Variable factors had marginal productivities equal (in value or marginal revenue terms) to their market-determined rewards. Fixed factors had returns that could exceed or fall short of market rates, thus signaling dynamic adjustment processes that would bring them back to a market-determined rate of return as the system moved toward long-run equilibrium.

I will here consider two types of situations which reveal the importance of recognizing disequilibria or their absence:

- 1) In many countries over the years, most recently in Paraguay, December 2006, I have found producers of tradable goods complaining about the low price of the dollar. Why, they say, is the Central Bank so blind as not to see that our problems could be easily relieved by a 20% or 30% or 50% devaluation of our currency? To which my reply has always been—we must look to see **why** the dollar is so cheap in real terms. Most of the time the cheap dollar is an **equilibrium** phenomenon. In Paraguay and some other Latin American countries, an important source of an appreciated real exchange rate is a large, steady inflow of emigrants' remittances. This causes an abundance of foreign exchange and hence a cheap dollar. A devaluation of any percentage by the Central Bank would basically do nothing to change the real equilibrium. Devaluing would be like taking an elevator in a high-rise building from a lower floor to a higher floor with an identical floor plan. My advice in such circumstances has always been (to those who complain about the cheap dollar)—“Write your relatives and friends abroad and tell them, please stop sending remittances. And tell your neighbors to do the same. And plead with the government to urge that everybody do the same. That's the way to generate a new real exchange rate equilibrium in which the real dollar won't be so cheap.” Obviously this is a tough-love message, but a true one. If you want to sweeten the bitter pill, you might suggest that they ask their relatives to send the money to New York instead of to Asuncion or some other intra-country place. In New York that money could then be invested in trust funds for the later education of the family's kids or grandkids. Thus the intra-family transfer would still be there, but the inter-country transfer would be postponed to a distant future and maybe even eliminated altogether (if the kids decided to study outside their home country).

The above was a case of people wanting to use the exchange rate to remedy an existing equilibrium situation. It has no effect. The exchange rate is serving as a nominal numeraire, and raising it simply raises all other prices along with it.

My next example is one of the real disequilibrium. I cite here Argentina during most of the latter 1990s. Sometimes a single observation can be the key to an important diagnosis. In the Argentine case, the observation is that the unemployment rate had reached 13% **even before** the so-called **tequila** crisis struck in December 1994. It remained near 15% all the way up to the 2001-02 currency flight and crisis, when it rose even higher. What is the story here? The story is that when the so-called convertibility law was promulgated (in 1991), that fixed the nominal exchange rate, the then-existing real exchange rate was “validated” by major inflows of foreign capital plus repatriations of Argentine funds. These inflows even helped to generate a rise in internal prices, causing the equilibrium real exchange rate to appreciate further. But the inflows did not maintain their pace, and other forces also impacted the equilibrium real exchange rate, calling for it to be devalued in real terms. Since the nominal rate was tied one-for-one to the dollar, the only way for Argentina to generate a real devaluation was for its general price and wage level to fall. In my perception, the deflationary pressure was continuous all the way up to the ultimate devaluation of the peso. It was this deflationary pressure that led to the continuous high rate of unemployment, which wouldn't have happened if prices and wages had been able to flex downward as our classroom examples sometimes postulate. So the Argentine case was one in which there was clear evidence of a disequilibrium, for which the nominal devaluation would be a solution. All this ended in a terrible crisis, entailing a leap of the unemployment rate to over 20%. But in the end

there was a major devaluation, with the price of the dollar rising from one to around three pesos. The general price level rose as a result, but by much less than the exchange rate. In my interpretation, the resulting real devaluation is a very important part of the explanation of Argentina's surprisingly rapid growth in the years that followed.

So the same policy tool can be totally ineffective (and probably net counterproductive) in a case like Paraguay's (starting from a real-exchange-rate equilibrium), while it can be a great stimulus and a genuine boon in a case like that of Argentina, where one is starting from a situation of clear disequilibrium.

- 2) In the next case, we consider situations of rising price levels in countries with fixed exchange rates. My instinct here, based on decades of observation of many real cases, is that most of the time such increase in the internal price level should be thought of as relative price adjustments rather than as episodes of "inflation". Put another way, in most of these cases what we are observing is a gradually appreciating real exchange rate, which sometimes might be in equilibrium all the way, and sometimes might represent a gradual approach to a new equilibrium. A-la Marshall, we sometimes might be able to say that a gradual rise in the price level might represent a short-run equilibrium at each point in time, while it simultaneously represents a gradual adjustment to a "target" level representing the new long-run equilibrium. How can this trick be explained? Quite easily. An export-price boom or a new flow of remittances or a new inflow of capital triggers the Central Bank into buying lots of dollars and issuing new pesos in return. This leads to an increased money supply, to an excess of  $(M^S/P)$  over  $(M/P)^d$ , and to spending that bids up the prices of nontradables. If the new flow of dollars were a "pulse", this would lead to a progressive erosion of the initial jump of international reserves. But if the new flow is a continuing one, a new full equilibrium will be achieved only when the Central Bank is no longer a net buyer of dollars. That is, imports have to expand and/or exports decline (non-oil exports in the case of an oil boom) to the point where overall payments are in balance. The "new" foreign exchange coming from the "new" source has to end up being fully reflected either in increased imports and/or reduced exports.<sup>2</sup> What we see in this case is a series of "transitory" equilibria where the payments surplus ends up adding to international reserves. As the nontradables price level rises, the increment to reserves declines period-by-period. But so long as there is any increment to reserves, the price level will continue to rise. Full equilibrium will be attained when the net increment to reserves is zero.<sup>3</sup>

My main point here is to say that most of the time, internal price level rises in fixed exchange rate settings are simply reflections of an appreciating real exchange rate. Many cases exist—Russia from 2000 to the present is a good example. There the exchange rate was not fixed by law but was kept within a relatively narrow range, while the price level moved steadily upward, without any sign of unwanted reserve loss. Another case is Chile over the past several years. There, a major copper price boom has led to an appreciating nominal exchange rate combined with steady but modest increases in the price level. Another case is Paraguay, where a real exchange rate appreciation has ended up with split effects—about half of it being reflected in a nominal

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<sup>2</sup> Reduced non-oil exports in the case of an oil-price boom.

<sup>3</sup> All this has to be modified for the case of a growing economy. There one should allow for a nominal increment of international reserves sufficient to be compatible with the increment of  $(M/P)^d$  that corresponds to the contemporaneous growth of aggregate output in the economy in question.

appreciation, and the other half in a rising price level. Should the Central Bank think of this price level rise as “inflation”? My answer is a very clear “NO.”

**6. RETHINKING EARLIER INFLATIONS:** As an undergraduate and as a graduate student, I learned about the connection linking inflation to money creation and its twin, linking money creation to fiscal deficits financed at the banking system. Later, as I visited Latin America in the late 1950s and early 1960s, I thought I found multiple examples of these linkages in action. I saw the fiscal deficits; I witnessed their financing by money creation at the banking system; and I certainly saw the ensuing inflation. Theory learned; facts observed; theory confirmed—or so I thought.

Imagine my surprise, then, when I realized that I had not seen what I thought I saw. The scenario described in the preceding paragraph would be a perfect fit to the facts, if my observations had been of countries with reasonably freely floating exchange rates. But such was not the case. The standard story of Latin American inflations in the 1950s and 1960s was one of continuing attempts to maintain a fixed exchange rate, interrupted by sporadic large devaluations. A country’s exchange rate would be fixed; continuing fiscal deficits financed by money creation would expand the money supply; prices would then rise on and on, fueled by the monetary expansion—until, under a variety of pressures, the government announced another big devaluation to a new fixed rate. One outcome of this system was a sawtooth pattern of the real exchange rate—the big devaluations were simultaneously nominal and real, but the new rate, fixed in nominal terms, was steadily eroded in real terms by the ongoing inflation, causing increasing havoc, particularly in the country’s export sectors. Often, it was pressure from them rather than distaste for the inflation itself that was the main motivation for the next big devaluation.

Most, maybe even all professional observers were aware of this part of the story, too. We all saw the sawtooth movement of the real exchange rates, and concluded that it only added to the standard ill-effects of inflation per se. This led us to suggest policy modifications that allowed for more-or-less continual adjustment of nominal exchange rates as inflation proceeded—an argument which led Chile and Brazil to adopt policies of “mini-devaluations” and in the Brazilian case of real exchange rate targeting (from the latter part of the 1960s until the late 1970s); under these policies, our old scenario story regained validity.

But that story was not valid under the stepwise-devaluation, sawtooth-real-exchange-rate scenario. The key question here is, how did the price level rise so much, in the presence of fixed exchange rates? Why did each country not undergo a sharp loss of international reserves, which then would drive the money supply back down? Why did the mechanisms of the monetary approach to the balance of payments not work in these situations?

The answer is that the government of those days interfered with that mechanism so as not **to allow it to work**. The true scenario of the sawtooth real exchange rate went like this: A new devaluation would set the economy on a better track and would probably engender a balance of trade surplus for a while. But continued monetary emissions would quickly erode that surplus (not only did we have  $(M^S/P)$  greater than  $(M/P)^d$  for the public at large; also at work was the government’s direct spending of its borrowings from the banking system—some fraction of these were also spent on tradables. So, rather quickly, the balance of trade surpluses would shift to the deficit side, engendering a loss of international reserves. At this point the Central Banks’ attention shifted to protecting their remaining reserves. Out came a whole grab-bag of measures—import quotas, import prohibitions (on a list of items), import surcharges, import licensing, prior deposits for future imports. Sometimes

governments were called upon to raise existing tariffs on imports. At other times export subsidies were introduced on specific items. Sometimes dual or multiple exchange rates were called into play, even while maintaining the original, fixed “basic” rate.

Without these patches and crutches, the drain of reserves would have quickly become intolerable and unsustainable, and either the inflationary money creation would have had to cease or the exchange rate would have to have been devalued much earlier and much more often, **either** becoming flexible **de jure** or coming close to it by approximating the later mini-devaluation schemes.

It is sad that this whole story is not widely known. Part of the reason is that it is so hard to research. How does one gauge the intensity and extent of import licensing restrictions when one has no access to data on the licenses that were granted? How does one even gauge the restrictive power of surcharges and tariff adjustments that are different for a myriad of import categories and anyway are changed every few weeks or months? The bottom line is that the task is far too daunting and difficult for serious research efforts to have emerged.

Nonetheless, the lesson is there—sawtooth real exchange rate patterns are generated as tariffs, quotas, prohibitions, licenses, prior deposits, surcharges, etc. are used to “bottle up” within the country a sequence of monetary expansions that normally, under a straight fixed exchange rate regime, would have far earlier been dissipated through losses of international reserves. One needs to recognize the key role played by those “international reserves defense mechanisms” in generating most of the Latin American inflationary experiences of the 1950s and 1960s.

**7. LEARNING TO “THINK BAYESIAN”:** I do not think that one can do a serious job of diagnosing economic situations if one approaches the world with a standard statistical hypothesis-testing mentality (i.e., new hypothesis  $H_1$  versus null hypothesis  $H_0$ ). There is nothing wrong with such hypothesis testing, but it is simply not the right suit of clothes for the diagnostician. Diagnosticians have to start out with a “view of the world” that covers pretty much the whole gamut of possibilities that is relevant in a particular case. Most of the things they see will likely “fit” into their “prior” view—inflations leading to lower  $(M/P)^d$ , private sector credit being squeezed as a result, leading to a curtailment of the rate of investment and of the country’s rate of economic growth. A seasoned observer can scan lots of information without being particularly shocked or surprised. But then something happens to elicit such a reaction, one that should set in motion an effort to get to the bottom of the problem. In the case of the stepwise devaluations, the “old” scenario seemed to fit the facts perfectly well—until I learned and internalized the monetary approach to the balance of payments. It was this that led me to ask, where was the large and growing trade deficit and loss of international reserves that I now had reason to expect would “surely” be there in the old scenario. It wasn’t there, hence a new explanation had to be sought.

Similarly, we have today many people who talk about “inflation” in Russia as if it were a problem for economic policy to try to solve. The answer is that it is not inflation but an adjustment of the real exchange rate, accomplished mainly through the internal price level rising and only modestly through the nominal exchange rate appreciating a bit. Again, if it were inflation of the usual kind, we would see huge losses of international reserves. Not only are these reserve losses absent, but there have been huge increases in Russia’s international reserves, mostly reflected in expanded quantities of Money plus Quasi Money.

This latter observation brings up another puzzle. With all that monetary expansion, why has not the price level risen much more? The answer is that the public's demand for  $(M/P)^d$  has risen far faster than GDP. When one tries to explain why Russia's price level did not multiply by 3 or 4 (as would be motivated by the observed monetary expansion), the answer is that there had been an absolutely huge amount of what I call "sterilization by the people"; that is, people's being willing to hold much larger cash balances than one would normally expect (based on their "old" demand function for  $(M/P)^d$ ). In Russia's case, this is probably attributable to the shift from unpredictable, even chaotic economic policy under President Yeltsin to more stable, more orderly policy, plus more stable, more orderly expectations, that evolved once President Putin was in power. <sup>4</sup>

I should add here that "thinking Bayesian" represents a perfectly sound application of the scientific method. According to that method one theory is supplanted by another when that other theory provides a better explanation of the facts than the first. In Bayesian terms, we enter the scene with a set of "priors" that encapsulate all the previous evidence and experience available to us. When this set of priors is shattered by some new set of facts or some new approach, the challenge is to gain a new understanding that incorporates the new facts as well as the old, and based on this build a modified set of priors with which to face the future.

I cannot leave this section without bringing up an important aspect of Bayesian priors. One has to think of them as somehow embodying all our experience and understanding, and not just some formal experiment or two. I believe the "law of demand" to be utter scientific truth. If somebody fits a demand equation in which the fitted price-elasticity of demand is positive, I will **not** believe that future rises in relative price will **cause** future increases in quantity. If I have to make projections, I will impose a more reasonable elasticity based on other evidence. <sup>5</sup>

But how can I be so **sure** about the law of demand? What can I say? This is what economic theory tells me is true for the rational consumer (we are talking about compensated elasticities, not uncompensated ones, for our regressions and just about everybody else's have real income as an additional determining variable.) Furthermore, I follow the Austrians in accepting introspection as an added source of information, particularly when I can check to see if my friends and acquaintances "introspect" the same way I do. But finally we have what I call mental experiments, which I find super-convincing, but which we hardly talk about at all in our professional discussion. An example follows.

Suppose somebody's regression somehow came up with a positive own-price-elasticity of demand for gasoline. To confront that, I ask readers to consider the recent rise in the price of gasoline and make a series of mental experiments. Consider the demand for gas in each of the 50 states plus D.C. In how many did demand go up (making corrections for changes in population, vehicle stocks, and income if

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<sup>4</sup> A similar, even more dramatic shift in the  $(M/P)^d$  function has taken place in China over the last decade or so. Part of the increase in monetary holdings is a direct function of the increase in income. But part comes indirectly as the conservative Chinese consumers adjust their consumption only slowly in response to huge increase in their real incomes. The resulting savings might, in some other countries, have quickly filtered into other assets like stocks, bonds, and physical assets. But in China they seem to have gone instead into savings accounts. Thus we have over ten years something like a fourfold increase in monetary balances with only a modest upward drift in the price level. Once again, it is "sterilization by the people".

<sup>5</sup> For example, in a recent paper James Cunningham and I fitted demand functions for household electricity for 49 states of the U.S. (Maryland had to be left out because its electricity data were co-mingled with those of the District of Columbia.) For our own work, in the few cases in which the fitted price elasticity was positive, we imposed one of zero. If I had to make projections I would probably prefer to use an average elasticity calculated for neighboring states, rather than zero. Certainly, I would never base a projection on the fitted, positive price elasticity.

such changes were important), and in how many did demand go down? Let's say demand went up in 5 out of 51 cases. One does not need to assume that all the states have the same elasticity. The hypothesis is that all true regression means are negative, subject to exogenous shocks and sampling errors so that positive observations are possible. Our binomial test compares this hypothesis with the null hypothesis that the means are zero. So we want the probability associated with getting 5 heads in 51 tosses of a coin. Significance level—out of sight! But if that's not enough, make the same mental experiment for every county in the U.S. Then for every township. Then for every gas station. And finally for every vehicle-owning or vehicle-leasing entity. I end this mental experiment convinced that the ending significance level is one in a trillion or less. But any doubter can actually get to work with the actual data to check out this result. I predict that doubters would not have to go far down the chain—from states to counties, etc., before they too were convinced that the law of demand was truly an “iron law”.

**8. THINKING CLEARLY ABOUT LABOR MARKETS:** In working in developing countries over the years, I have been impressed by how often people were reaching what I felt were wrong conclusions on the basis of what I thought was an erroneous picture of how labor markets work. Back in the old days we witnessed people making crude assumptions that the relevant opportunity cost of labor was zero (to which I have always agreed, so long as the workers were willing to work for a zero wage). That fallacy has by now been largely surmounted but others remain, such as that workers in a firm “deserve” a rise in their real wage when per worker productivity in that firm increases, or that a stimulus to the demand for labor in an economy will first mop up most of the unemployed before engendering a rise in market wage levels. Or that changing a few laws will bring to wages their long-absent “downward” flexibility. To deal with a few of these issues, I have included an appendix on labor market issues.

**CONCLUSION:** In presenting the present **potpourri** of vignettes, scenarios, and reflections, my belief is that the items treated are basic enough, and important enough, and simple enough, so that one should expect that they would be part of the standard kit of tools of most economists as they finish their second year of graduate study. My own experience with such graduate students, as well as with recently-minted Ph.D.'s, tells me that the contrary is true. Far too few of them seem to even have been exposed to most of the issues treated here, let alone to have incorporated them into their basic framework of thinking about economics and economic problems.

I have in mind a dream of helping to stimulate curriculum revisions that will rectify this situation. Ideally such revisions would be quite general, extending to most undergraduate and graduate programs, so this sort of insight would really be part of most economists' toolkits. But if this objective is unattainable, then at least I would hope that these insights would reach those whose programs specialize in policy economics and even more particularly in policy economics for developing countries. I hope to be able to enlist the collaboration of like-minded colleagues, and to draw from them many other fundamentals-based suggestions, so that we can jointly mount a major push toward this goal.



# APPENDIX

## LABOR MARKET EQUILIBRIUM

This is an effort to set down in a succinct way some basic elements of labor economics that seem to me to be highly essential for applied economists, particularly those dealing with public policies, to have as part of their “working tools”.

Perhaps the most profound and pervasive principle of labor economics deals with the connection between the wage or salary of a category of workers, and the marginal productivity corresponding to that category. Certain key propositions emerge from an examination of this principle.

- a. At the level of the firm, or even of the industry, **it is the marginal productivity that is adjusted to make it equal (or more nearly equal) to the wage, not the wage that is adjusted to correspond to marginal productivity.** Broadly speaking, the wages of labor are determined by supply and demand in the labor market. Where this is not the case they may be set by decree or by law (minimum wages), or they may reflect the power of particular unions in a collective-bargaining process. It really does not matter which of these processes was operative in determining the wage that prevails at a particular time for a particular firm. The managers of that firm will have to ask themselves the question, does it pay for this firm to add to or subtract from its existing use of labor of each given type? If adding labor will add to profits, it presumably will happen. The same goes if the way to increase profits is to reduce the use of any given kind or kinds of labor. (At this level of analysis, one should interpret marginal product to be “value of marginal product” in the competitive case, and to be “marginal revenue product” in cases where the firm exercises a significant degree of market power in the market for its output.)
- b. An important corollary is that increases in the productivity of a firm’s labor, such as those that occur as a result of new technologies or changed capital intensities, do not in principle provide a motivation for changes in wages. “Shocks” of these types give rise to shifts (to the right or to the left) in the firm’s demand curve for labor. The natural response is therefore an adjustment in the quantity of labor the firm hires, not in the wage that it pays (for a given type and quality of labor).
- c. In interpreting the above, and in studying labor market phenomena in general, one must always be aware of the great diversity and, ultimately, heterogeneity of the “human factor of production”. Thus, when one says there is a given market wage for a specific type of labor, one is really speaking of a band, not a single point. At the top of the band are those within the category who have more skill and/or experience, and/or those who simply put forth more effort, hence work harder. This leads to interesting subtleties of labor market analysis. For example, when a higher wage is “imposed” on a firm, it may well be able to partly (maybe even fully) offset the apparent increase in labor cost by “picking and choosing” from among potential workers those with more skill, experience, reliability, etc. It may also, faced with an abundant supply of willing applicants, demand and successfully extract from the workers a greater supply of effort per man hour. The key to understanding this type of adjustment is that it concerns a wage which is “toward the top of the band” for the category of labor in question. The capacity to pick and choose, or to demand greater than standard amounts of effort, stems from the fact that one is paying a higher than

standard wage for the type of labor in question (i.e., one is operating “toward the top of the band”).

- d. In general, economists should work with the idea that the location of a firm, or a particular set of jobs, within the band of wages for a particular type of labor will normally be determined endogenously. Thus, it may be true that in the present age, it requires much the same skills (aptitude for dealing with people, some minimal computer skills, a certain orderliness of mind) to be a night clerk in a small hotel or to be a ticket agent of a major airline at a big metropolitan airport. Yet without a doubt the ticket agents will be paid significantly more than the night clerks. Why? Because one “job” requires a very high degree of continuous alertness and effort, while the other is much less demanding, even though it uses the same skills. Thus needy graduate students often serve as night clerks, doing homework assignments and even taking intermittent naps. The low effort requirement of the job make it easily compatible with the demands of graduate study, something that cannot be said of the job of a ticket agent. Normally, then, the labor market for a particular set of skills will be characterized by a band of wages or salaries, but particular employments will have quite definite places within that band. These can be regarded as “equilibrium positions” from the point of view of both the employers and the workers. The market faces both employers and workers with a menu (or better a continuum) of possible mixes of wages, skill, experience, effort, etc., even within a given “job category”. Demanders and suppliers then choose the mix that is most appropriate to them. If workers become more averse to hard work, the menu will change, and the premium for effort will increase, inducing demanders to choose less effort-intensive mixes, to the degree that they can.
- e. The preceding two points have considerable bearing on the concept of “efficiency wages”, which has gained some currency in the recent literature on labor economics. The broad message is this: that the concept of equilibrium is as fully applicable to labor markets as to other markets. It is extremely unlikely, to the point of being unworthy of serious general consideration, that a firm will be able to accept an enforced rise in the wages it pays, and then be indifferent with respect to staying with the new, higher wage on the one hand and returning to the initial starting point on the other. This does not say that the firm will not avail itself of all the mechanisms of subtle adjustment at its disposal, if it is forced to pay a higher wage. Using these mechanisms (having more scope for picking and choosing, insisting on greater effort, etc.) represents the firm’s response to the “distortion” of an enforced higher wage, it does not mean that the distortion does not exist.
- f. The same set of considerations can be applied to the phenomenon of so-called “dual” labor markets. These typically consist of a “formal” or “protected” sector of the labor market, where wages are high, and an “informal” or “unprotected” sector where wages are low. In its mildest variant, the dual labor market might simply be a special case of the band of wages referred to earlier, where the natural equilibrium wage for the formal sector is higher than that for the informal sector. Most of the discussion of dual labor markets, however, goes well beyond this point, and posits that the wage in the formal or protected sector is somehow set above the relevant market-clearing wage, producing a wage band significantly wider than would arise from the natural forces of the market alone. One by-product of this phenomenon is the appearance of quasi-voluntary unemployment—consisting of people who are desirous of working at the protected-sector wage, but unwilling to work at the unprotected-sector wage. These people are usually counted as unemployed, at least if they can show that they carried out an active search for

a job (even though that search might have been exclusively concentrated on employment in the formal or protected sector).

## UNEMPLOYMENT AND LABOR MARKET ADJUSTMENT

There are a number of different scenarios that give rise to unemployment (quasi-voluntary, seasonal, long-term in depressed areas, etc.) I do not want to consider them in this section, but rather to focus on the kind of unemployment that Argentina appears to have suffered in the latter 1990s and up through its recent crisis. I would characterize this situation as one of a labor-market disequilibrium that is at least of medium-term duration. Moreover, I would consider the disequilibrium to apply to a significant sub-segment of the overall labor market, not just to one or a few isolated areas and/or occupations.

- i. Widespread unemployment exercises a downward pressure in real wages. The economy can respond to this pressure either by a rise in the general price level, causing real wages to fall so long as nominal wages are either rigidly fixed or simply sticky, i.e., slow to adjust, or by a direct downward adjustment of nominal wages, if they are sufficiently flexible in a downward direction. Much experience with depressed labor markets indicates that adjustment via the general price level is both easier and quicker to accomplish than adjustment via reductions in the nominal wages paid by each enterprise to the affected classes of workers. The reason usually given as to why this is so concerns the level of “personalization” of the wage rate. When the general price level rises, no worker thinks that his employer is responsible for it; also, no worker harbors a suspicion that the general rise of prices was aimed at him. Such is not the case when individual enterprises try to reduce nominal wages, either across the board, or for particular classes of workers, or for individual workers. Even if the reduction is across the board for all workers of a firm, the workers may nonetheless harbor questions like “Why us, and not others in other firms?” When the reduction has only partial coverage, the question is “Why us, and not others in the same firm?” Subliminally, at least, there is always a doubt concerning whether the employer is taking advantage of the particular employees or groups in question. None of these issues arises when the reduction in real wages takes place through a rise in the general price level (though the issue may become complicated in an ambience of general inflation, where something approaching indexation or quasi-indexation of wages may have arisen in consequence of long experience with inflation).

An empirical exercise is all that is needed to convince an observer that in virtually no case where a country’s level of real wages has fallen significantly has that real wage reduction come about mainly as a consequence of reduced nominal wages. In contrast, virtually every significant fall in the general level of real wages has come as a consequence of the general price level rising, while wages did not, or of the general price level rising significantly more than that of wages.

- ii. The resistance of wages in the face of pressures for downward adjustment has been documented in data on the “asking prices” or “supply prices” of workers who are unemployed. The tendency of unemployed workers is to state a supply price which is close to the prevailing wage for their type of labor. The supply price varies little, even after considerable periods of unemployment. Unemployed workers may take temporary employment at much lower wages (e.g., an unemployed engineer might drive a taxi to contribute something to household income, while at the same time being unwilling to work as an engineer, except at something like the prevailing

salary for engineers). This helps explain why unemployment is more easily absorbed through inflationary movement of prices than through deflationary movement of wages.

- iii. It is a fallacy to think that increases in labor demand will first absorb large numbers of unemployed at given wages and only then start to have an impact on the general level of wages. Different scenarios of labor-market behavior lead to the same conclusion. On the one hand, one can think of a labor market in which some categories have significant unemployment, and others not. Increases in demand then cause wage rises in the segments that were initially in an equilibrium of supply and demand, even if wages stay constant in the areas with significant initial unemployment. As a result, the general level of wages (and prices) rises as a consequence of a generalized increase of effective demand.

On the other hand, one can have a more subtle appreciation of how labor markets work. Under this scenario, a new employer seeking 100 carpenters will not draw them all from the pool of unemployed carpenters. Only a fraction will come from there: a considerable part will be drawn from other employments. This will create upward pressure on wages of other workers long before the pool of unemployed carpenters is reduced to zero. An interesting corollary of this proposition is that the creation of 1000 new jobs (for carpenters) together with the simultaneous destruction of 1000 old jobs (for carpenters) in the same broad labor market will tend to produce a rise in the wages of carpenters together with an increase in the number of unemployed (i.e., all 1000 of the fired carpenters will in the first instance be unemployed, while only, say, 300 of the newly hired ones will have been initially drawn from the ranks of the unemployed. Thus, the simultaneous creation and destruction of jobs will have caused an increase in the level of frictional unemployment).

- vi. Considerations like the above help explain why the absorption of large pools of unemployed typically takes a long time. For example, the period from 1933-41 was one of sharply rising real income in the U.S. (except for the brief recession of 1938), yet unemployment, which started at over 20%, did not go under 10% until the U.S. became involved in World War II.







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# CONTRIBUTIONS TO A SOURCEBOOK OF HELPFUL HINTS FOR TRAINING FUTURE PRACTITIONERS OF DEVELOPMENT ECONOMICS AND POLICY

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The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

Arnold C. Harberger, University of California, Los Angeles.

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## INTRODUCTORY NOTE

The immediate purpose of this paper is to serve as background material for participants in a conference for improving economics training in and for developing countries. We are inviting each of these authors to contribute his or her own list of vignettes each dealing with a point that the author feels is overlooked or short-changed in most ongoing training programs, and which could usefully replace less-relevant materials that are actually included in such programs.

I do not apologize for the somewhat technical tone of these notes, because the function of the training programs that we are talking about is to produce serious professional economists who have genuine command of the basic tools of their trade.

I have chosen these vignettes from public finance, with a sort of micro orientation. In another piece that will also be distributed to participants "Can We Identify the Basic Tools...?", I give examples with a more macro orientation.

## 1. INCOME AND SUBSTITUTION EFFECTS

Real income is operationally defined as a Laspeyres index

$$Y = \sum_i P_i^o X_i.$$

In two dimensions ( $i = 1, 2$ ) this breaks down to a set of parallel diagonal lines between the  $X_1$  and  $X_2$  axes. Pick any two points A and B on such a grid. They will be characterized by their "own" sets of relative prices,  $P_a$  and  $P_b$ , and by their own indexes of real income,  $y_a$  and  $y_b$ . Through point A there will be an income-expansion path—the locus of all points of potential demand equilibrium under relative prices  $P_a$ —label that path  $E_a$ . Similarly there will be through point B an income expansion path  $E_b$ , characterized by potential demand at prices  $P_b$ . We now define two additional points A' and B'. A' is the intersection of  $y_b$  with  $E_a$ , and B' is the intersection of  $y_a$  with  $E_b$ . We then have two breakdowns into income and substitution effects—one, an income effect move along  $E_a$  from A to A', and a substitution effect move along  $y_b$  from A' to B, and the other, a substitution effect move along  $y_a$  from A to B', together with an income effect move from B' to B. This exposition can be shown in a simple two-dimensional graph, but extends easily to  $n$  commodities ( $i = 1, \dots, n$ ).

## 2. COMPENSATED AND UNCOMPENSATED ELASTICITIES

Consider that the move from A to B is the consequence of a change in the price of  $X_1$ , other prices and money income staying the same. The elasticity measure obtained from the move will be  $\eta_{11}^u$ , an uncompensated own-price elasticity. The move from A to B' will encompass an income effect equal to  $m_1$  (the marginal propensity to spend on  $X_1$ ) times the change in real income  $[-X_1 \Delta P_1]$ , divided by the price ( $P_1$ ) of the good in question]. So the change in  $X_1$  due to the income effect is equal to  $-m_1 X_1 (\Delta P_1 / P_1)$ . To get the corresponding percentage change in  $X_1$ , we divide by  $X_1$  obtaining  $-m_1 (\Delta P_1 / P_1)$ . Thus we have the following relationship between the compensated and uncompensated own-price elasticities of demand:

$$\eta_{11}^u = \eta_{11}^c - m_1.$$

The corresponding relationship for cross-elasticities is

$$\eta_{ij}^u = \eta_{ij}^c - \sigma_i a_j,$$

where  $a_j$  is the average propensity to spend on  $X_j$  and  $\sigma_i$  is the income elasticity of demand for good  $i$ . [There is no contradiction between the two expressions above, since  $\sigma_i = m_i/a_i$ ].

At this early point in a student's training, it is worth while to drive home that there can hardly be an important difference between compensated and uncompensated elasticities for most items for which elasticities are measured, since their marginal and average propensities are likely to be very small. Important differences can enter in cases like the demand for tradables and nontradables, possibly in housing, and certainly in the case of the demand for leisure (= supply of labor). In the latter case, the compensated and uncompensated statistics of labor supply are linked as follows:

$$\epsilon^u = \epsilon^c - m_\ell,$$

where  $m_\ell$  is the marginal propensity to consume leisure, defined as the fraction of an increment to real income that is taken out in the form of leisure. Historically,  $\epsilon^u$  has been negative. This limits how much greater than zero  $\epsilon^c$  can have been. Plausible numbers might be  $\epsilon^u = -.15$ ,

$$\epsilon^c = +.10; m_\ell = .25.$$

### 3. MORE ON DEMAND AND SUPPLY

Many economists somehow have been brought up to think that the uncompensated elasticity is the "natural" one, and that the compensated elasticity is sort of artificial, requiring some sort of hypothetical, extraneous act of compensation to take place. Actually most econometric work on demand has real income as one of the main explanatory variables. Hence at least in principle, most measured price elasticities are "compensated".

On a related matter, when economists examine the likely effects of policy interventions like taxes, subsidies, agricultural programs and the like, the question again arises of what to hold constant in the analysis. One key fact is pretty clear—by imposing a tax, granting a subsidy, or supporting a product's price, the government is doing nothing to alter the underlying set of resource constraints under which the economy operates. A resource-constrained demand function is a close relative of the standard "compensated" demand function, but is hard to bring down to the individual level.

A very useful way to think of resource-constrained demand and supply functions is to define these functions "on the instrument" whose effects we are analyzing.

To conceptualize such functions, think of  $X_1^0 = 100$  and  $p_1^0 = 1.0$  as the equilibrium quantity and real price that would prevail for  $X_1$  in the absence of any tax or subsidy. Now consider a tax of .10 on that good. That might lead to  $X_1 = 90$ , demand price  $p_1^d = 1.05$  and supply price  $p_1^s = 0.95$ . A tax of .20 might similarly lead to  $p_1^d = 1.10$ ,  $p_1^s = 0.90$  and  $X_1 = 80$ . A subsidy of .20 could produce  $p_1^s = 1.10$ ,  $p_1^d = 0.90$  and  $X_1 = 120$ . An exercise like this implicitly uses the economy itself as our computer, and traces out loci of demand price, supply price and quantity as we vary the rate of tax or subsidy in  $X_1$ .

Using these demand and supply functions it is easy to trace out the quantity, price and efficiency cost consequences of taxes, subsidies and other policy interventions.

#### 4. A RESOURCE-CONSTRAINED SYSTEM

I will present this system here for the case of generalized constant costs (= infinite elasticities of supply). One need not think of them as prevailing over the entire range of the variables, but only over the relevant range over which those variables will move, as one introduces taxes, subsidies, and other instruments of policy. I will deal here only with taxes and with subsidies (conceived as negative taxes). General equilibrium constraints are observed by assuming either:

- a. tax moneys are all returned as lump sum subsidies, or
- b. the government's demand functions for spending tax revenues are similar to those of the public, or
- c. the government buys a specified vector of goods and services, and finances these outlays by the specified taxes, returning excess receipts via neutral subsidies, or meeting revenue shortfalls via additional neutral taxes.

All of these alternatives allow us to work with a demand system for the economy as a whole. It is this system that we now explore.

Using  $S_{ij}$  to represent  $\partial X_i^d / \partial P_j^d$ ,  $\sum_i P_i^s S_{ij} = 0$ . We have, first of all, from the resource constraint,  $\sum_i X_i P_i^s = 0$ .

Since the  $P_i^s$  are all constant, it follows that  $\sum_i P_i^s S_{ij} T_j = 0$ . That is, imposing any one tax causes resources to shift around, but does not change the overall resource constraint. The above equation gives us one adding-up property of compensated demand functions, i.e.,

$$\sum_i S_{ij} T_j = 0$$

Another adding-up property comes from the idea that a neutral system of taxes should not lead to any change in equilibrium quantities. Thus a fully general, uniform tax on all relevant flow demands (including leisure) should leave all equilibrium quantities unchanged. Thus,  $\sum_i P_i^s S_{ij} T_j = 0$  when the  $T_j$  all obey  $T_j = \tau * P_j^s$ . This leads to the adding up property  $\sum_i S_{ij} P_j^s = 0$ .

It is interesting to note that the standard symmetry property of substitution terms  $(\partial X_i^d / \partial P_j^d) = (\partial X_j^d / \partial P_i^d)$ , which in our notation is  $S_{ij} = S_{ji}$  eliminates any possible contradiction between the above two adding-up properties, derived from different mental experiments.

#### 5. AN INTUITIVE DEFENSE OF THE SYMMETRY PROPERTY

To see how the symmetry property works one has to think of dividing the substitution "away from"  $X_1$  into a bunch of component parts as implied by the first adding-up exercise, i.e.,  $P_1 S_{11} T_1 = -P_2 S_{21} T_1 - P_3 S_{31} T_1 - P_4 S_{41} T_1, \dots, -P_n S_{n1} T_1$ .

$P_3 S_{31} T_1$  is the amount of "purchasing power" that is shifted from  $X_1$  to  $X_3$  when the price of  $X_1$  is raised by  $T_1$ . This is equal to  $P_3 P_1 S_{31} \tau$  when  $(T_1/P_1) = \tau$ .

By a similar argument  $P_1 S_{13} T_3$  is the amount of purchasing power shifted from  $X_3$  to  $X_1$  when the price of  $X_3$  is raised by  $T_3$ . This becomes  $P_1 P_3 S_{13} \tau$  when  $(T_3/P_3) = \tau$ . Thus, the symmetry property means that a tax that raises the prices of  $X_1$  and  $X_3$  by the same percentage engenders no substitution

between them, only between each of them and all other goods (i.e., the purchasing power that shifts from  $X_1$  to  $X_3$  when the tax  $\tau$  is imposed on  $X_1$ , is shifted back from  $X_3$  to  $X_1$  when the same percentage tax is imposed on  $X_3$ ). This principle is the foundation of the theory of composite commodities, well explained by J.R. Hicks long ago in **Value and Capital**. But this is also what underlies the symmetry property. The symmetry property is often motivated as necessarily following, so long as the underlying utility function fulfills the “integrability condition”. Our justification does not contradict this; it merely puts economic meat on its more formalistic bones.

## 6. TAX ANALYSIS IN A GENERAL EQUILIBRIUM SETTING

The basic rule for measuring efficiency gains and losses takes competitive demand price as the measure of benefit and competitive supply price (or marginal resource cost) as the measure of cost. If we define  $D_i$  as  $(P_i^d - P_i^s)$  and  $z$  as representing the measure we are analyzing, with  $z$  being imposed at the level  $z^*$ , the general equilibrium efficiency effects of  $z^*$  are measured by

$$\Delta W = \int_{z=0}^{z^*} \sum_i D_i(z) \frac{\partial X_i}{\partial z} dz.$$

This allows for the  $D_i$ 's to change as  $z$  changes. Thus when the only distortion is a single tax on  $X_i$  the above measure leads to the standard triangle between the supply and demand curves —with linear supply and demand  $\Delta W = \frac{1}{2} T_i \Delta X_i$ .

In general, the distortions in “other” markets do not change as a new distortion is introduced. Thus introducing  $T_3$  when we already have  $T_1$  and  $T_2$  leads to  $1/2 T_3 \Delta X_3$ , in the directly affected market plus  $T_1 \Delta X_1$  and  $T_2 \Delta X_2$  in the markets with pre-existing taxes already in place.

If we start from scratch, with infinitely elastic supplies, and with  $W$  as our measure of welfare, we get

Step 1: Impose  $T_1$ — $\Delta W = \frac{1}{2} S_{11} T_1^2$ .

Step 2: Add  $T_2$ —additional  $\Delta W = \frac{1}{2} S_{22} T_2^2 + T_1 S_{12} T_2$ .

Step 3: Add  $T_3$ —additional  $\Delta W = \frac{1}{2} S_{33} T_3^2 + T_1 S_{13} T_3 + T_2 S_{23} T_3$ .

Overall:  $\Delta W = \frac{1}{2} S_{11} T_1^2 + \frac{1}{2} S_{22} T_2^2 + \frac{1}{2} S_{33} T_3^2 + T_1 S_{12} T_2 + T_1 S_{13} T_3 + T_2 S_{23} T_3$ .

Now, using the symmetry property derived earlier, we have

$$T_1 S_{12} T_2 = \frac{1}{2} T_1 S_{12} T_2 + \frac{1}{2} T_2 S_{21} T_1$$

$$T_1 S_{13} T_3 = \frac{1}{2} T_1 S_{13} T_3 + \frac{1}{2} T_3 S_{31} T_1$$

$$T_2 S_{23} T_3 = \frac{1}{2} T_2 S_{23} T_3 + \frac{1}{2} T_3 S_{32} T_2$$

Joining these six terms to the three terms of the form  $\frac{1}{2} S_{ii} T_i^2$ , we get, for the efficiency effects of all 3 taxes taken together

a)  $\Delta W = \frac{1}{2} \sum_i \sum_j S_{ij} T_i T_j$  (quadratic form).

Now, recognizing that

$$\Delta X_i = \sum_j S_{ij} T_j,$$

and with  $\Delta X_i$  standing for how much  $X_i$  has changed over all three steps, we have

b) 
$$\Delta W = \frac{1}{2} \sum_i T_i \Delta X_i \text{ (generalized triangle)}$$

Also, with a little more work using the symmetry and adding-up properties, one can show that

c) 
$$\Delta W = -\frac{1}{2} \sum_i \sum_{j < i} P_i P_j S_{ij} (\tau_i - \tau_j)^2, \text{ (pairwise breakdown)}$$

where  $\tau_i = T_i/P_i$ .

It is very important to recognize that all three expressions a), b) and c) say the same thing mathematically. But looking at all three adds to our economic understanding and (at times more importantly) can save us a lot of time and trouble.

For our economic understanding the idea of a generalized triangle is quite appealing. The way to think of it is that we are imposing “at the same time” a whole vector of taxes  $T_1^*, T_2^*, \dots, T_n^*$ . But instead of imposing them in sequence, we do so “radially”, starting with, say, 1/10 of each tax, then zipping it up to 2/10, then to 3/10, etc., until we finally reach 100%. In terms of our basic distortion formula we can write

$$\Delta W = \int_{\lambda=0}^1 \sum_i \lambda T_i^* \frac{\partial X_i}{\partial \lambda} d\lambda,$$

which for the linear case reduces to

$$\Delta W = \frac{1}{2} \sum_i T_i^* \Delta X_i.$$

This case obviously leads one to think of triangles, one for each commodity. When there is only one tax on only one good, this is just a standard, straightforward tax triangle. And it is pretty much the same if we think of taxes as only a few (out of many) items. But if we think of taxes spanning all goods, then necessarily half of the length of the bases of the triangles has to be positive, and their contribution to the overall change in welfare will also be positive; though necessarily outweighed by the other triangles in the series with a negative  $\Delta X_i$ .

Thinking of the pairwise breakdown of efficiency cost leads us to recognize that substitution is fundamentally a pairwise phenomenon and that movement along, say, the demand curve for apples can be expressed in terms of substitution of apples for other fruits, of apples for foods other than fruits, of apples for non-food tradables, of apples for nontradables, of apples for leisure.

Looking at the quadratic form expression for  $\Delta W$ , the first insight that comes from it is its resemblance to the quadratic form that represents the second-order condition for a maximum. In economic terms, if we start from an initially undistorted situation, we have no way to go but down, or at best stay level. This says that

$$\Delta W = \frac{1}{2} \sum_i \sum_j S_{ij} T_i T_j \Delta 0.$$

On the practical side, suppose we are working with a computable general equilibrium model, with a number of taxed industries and sectors. What is easier than to find the equilibrium of this model with zero distortions, then recompute to get the solution with all our taxes, and finally simply take  $\Delta X_i$  as the difference between these two solutions, to get a generalized-triangle measure of the total change in efficiency going from the undistorted to the distorted equilibrium, equal to:

$$\Delta W = \frac{1}{2} \sum_i T_i \Delta X_i.$$

The quadratic form is also useful for dealing with all sorts of “second-best” or even “nth best” problems. One favorite of tax specialists is the so-called Ramsey problem—minimize the efficiency cost of raising an amount  $R$  of revenue by imposing taxes  $T_1, T_2, \dots, T_k$  on  $k$  goods, which represent only a subset of the entire range of goods going from  $X_1$  to  $X_n$  ( $n > k$ ). The dual of this problem, which of course leads to the same solution, is to maximize the revenue to be obtained from  $T_1, T_2, \dots, T_k$ , while keeping efficiency cost constant. (An interesting insight from this dual expression is its similarity to the problem of a discriminatory monopolist selling a product in  $k$  separate markets).

## 7. WE GET TO CHOOSE OUR OWN TOOLS FOR EACH PROBLEM

We economists should never forget that it is we who constructed our tool kit, for the purpose of helping us in our various tasks. Hence we should always be ready to jump from one variant to another, as we go from task to task. The three variants of the expression for  $\Delta W$  are equivalent, but the generalized triangle is the easiest way to measure efficiency costs in a computable general equilibrium exercise, the pairwise breakdown is the easiest way to show the neutrality of a uniform percentage tax that is truly general, and the quadratic form is the most effective way to find second-best solutions.

The lesson carries over to the choice of **numeraire**s in which to couch our analysis or carry out our original exercises. For example, in a fixed exchange rate system, looking over time, the natural numeraire is  $E\bar{P}^*$ , the nominal exchange rate  $E$  times the world price of tradables. [Note that this numeraire is independent of the choice of foreign currency in which  $E$  is expressed. If  $E$  is pesos per dollar, then  $\bar{P}^*$  must naturally deal with dollar prices of tradables  $\bar{P}^*$ . If we change to  $E'$  (= pesos/Yen) then obviously the corresponding  $\bar{P}^*$  must reflect the yen price of tradables. Thus  $E' = E * (\$/\text{¥})$ ,  $\bar{P}^* = \bar{P}^*$  and  $(\text{¥}/\$)$ . Hence  $E'\bar{P}^* \equiv E\bar{P}^*$ , so long as we are dealing with convertible currencies.]

When we carry out policy analyses, we nearly always will be taking the time path of as given, so our numeraire is proportional to  $E$ . This helps us see that, if we start from a position of equilibrium in the real economy, a simple change of the nominal exchange rate will typically lead to the same real equilibrium being restored, but at a higher level of nominal prices.

On the other hand, when one sets up a problem in the form of what I call a Cobb-Douglas world (product demands derived from a Cobb-Douglas utility function, factor demands from Cobb-Douglas production functions), the natural numeraire is total expenditure. If we call total expenditure  $Z$ , then the product demand functions will be  $X_i P_i = a_i Z$  and the demand for factor  $i$  in industry  $j$  will be  $F_{ij} = b_{ij} a_j Z$ . The total demand for factor  $i$  will be  $\sum_j b_{ij} a_j Z$ . Since this does not change if we impose a factor-income tax (e.g., corporation income tax) on factor  $i$ , it follows quite directly that the incidence of such a tax will fall on factor  $i$  alone—a result that is readily found using  $Z$  as the numeraire, but much harder to find if another numeraire is chosen.





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# IMPROVING ECONOMICS TRAINING IN AND FOR DEVELOPING COUNTRIES: PROPOSAL FOR A CONFERENCE

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# IMPROVING ECONOMICS TRAINING IN AND FOR DEVELOPING COUNTRIES: PROPOSAL FOR A CONFERENCE

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Arnold C. Harberger, University of California, Los Angeles.

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# IMPROVING ECONOMICS TRAINING IN AND FOR DEVELOPING COUNTRIES: PROPOSAL FOR A CONFERENCE

To help set the stage for this proposal, let me recount my own experiences with what might be called “total immersion” in the problem we are dealing with. In early 1994, I was approached by Domingo Cavallo, then Minister of Economy in Argentina, to help organize a university-level program for training economists for his own ministry as well as for other ministries and agencies of the Argentine government. The idea was to design a program of two years’ duration, which would be administered by Argentine universities, and which would focus on giving young Argentines the kind of training and the kind of tools that would best prepare them for future careers as government economists.

Cavallo got this idea as a result of two experiences. The first was his stint as foreign minister of Argentina. While at the foreign ministry he was impressed by the level of professionalism that he found among the members of the diplomatic corps. He took special note that entry level diplomats were the products of a university-level training course, specially designed to prepare them for a career in the foreign ministry. His second experience came when he took over the Economics Ministry. There, he had quite the opposite reaction. He was impressed (and distressed) by the lack of serious professionalism, even among high-level personnel (e.g., national directors), and by a generalized laxity, pretty much at all levels throughout the ministry, in making real use of the tools of our discipline to grapple with the problems of diagnosis, analysis, policy formation, and implementation.

It was at this point that Cavallo conceived the idea that ultimately led to the formation of the Higher Institute for Government Economists (ISEG), which was the organization that implemented the training program. ISEG ended up with wider responsibilities than just the 2-year university level program in which I was involved. It sponsored short courses on various topics, as well as regional outreach programs. But its main effort was the 2-year training program. This program was implemented at four Buenos Aires institutions—the University of Buenos Aires, CEMA University, the Torcuato Di Tella Institute and San Andres University. Maybe it would have been better to concentrate it more narrowly, but the chosen solution at the very least prompted a certain healthy competition among the four, and avoided carping criticism from those who would have ended up as losing bidders for the program.

These four institutions were asked to implement a program of studies that had been proposed at the behest and with the approval of the Ministry. I was part of the team that produced this recommended program.

Then, once the teaching program got started, I was named as its external auditor. My task was to try to keep tabs on the program—particularly on how well it was serving the purpose of giving

participants the tools and skills they would most need in future careers as economists in the Argentine government. Here is where my ordeal began. On my first 2-week visit as auditor, I was greeted at my hotel by 2 messengers, each carrying a banker's box full of "blue-books"—all the final exams and all the midterms of all the nine courses that had been given at all four institutions during the first academic year of the program. One thing I can guarantee—if you really want to get a good view of a course, not just the quality of the teaching, but its scope, content, emphasis, methodology, etc., there is no better strategy (other than attending the whole course itself), than reading its examination booklets. There you get a very good idea about what was taught, what was emphasized, what were thought to be important questions, what were thought to be the best answers.

If I learned any one thing from that and subsequent immersions in blue books over the next four years or so, it was this **theorem**: If you ask a recent Ph.D. from a good world-class university to teach a course on a given subject, chances are about 10 to 1 that he or she will present something pretty close to the last course they took on that subject in graduate school. It does not matter that this might be an undergraduate course while that was a graduate course. Nor does it matter that this course was supposed to be designed for public sector practitioners while that was designed for future researchers at the frontiers of knowledge. To me the theorem is as solid as the proposition that migrants to a new country tend to go to locations where friends and relatives are already installed. In both cases the action in question is totally natural and understandable. This is the easiest road to take, and the one that requires the least work. And in the case of the young faculty members, what better imprimatur of quality is there than the fact that this is simply a version of what they learned from their very own professor X in their very own world-class university Y?

The problem, of course, was that much of the time professor X's course whatever its merits, was not designed, nor even particularly apt for the training of future government economists. In macro, it might emphasize highly stylized models of dynamic optimization instead of much more basic study of real-world monetary and balance-of-payments adjustment. In international trade, it might emphasize how different countries' underlying endowments of natural resources, labor and capital influence their specializations, instead of how in real life a country's comparative advantage is continuously changing, being bombarded by shocks from international capital flows, fluctuations of world commodity prices, real cost reductions in its own production of tradables and nontradables, and by its own taxes, import tariffs, export subsidies, etc. These shocks elicit responses of real exchange rate adjustment that finally determine where the line is drawn that determines which activities pass and which other ones fail that economy's current test of comparative advantage. In micro, the basics of supply and demand can be lost in a maze of game-theoretic exercises. In econometrics, students can end up practically married to the idea of instrumental variables without realizing that in principle the only information content that an instrument brings to a regression is the true exogenous influence that it brings to bear (or otherwise represents) on the system being studied.

Getting back to my story, these discoveries revealed a problem that we never really cracked. The fact is that, at least at the university level, it is not easy to influence how a subject is taught. In the four universities of the ISEG program there were quite a few professors whose bluebooks revealed a nice sensitivity to the needs of future government economists. Most of these—not surprisingly—were in their 40s and 50s or beyond, with lots of teaching and professional experience behind them. For them it was easier to shift gears, and tailor their classes in light of the specific purposes of the ISEG program. Also, they revealed an oft-observed rule that while new professors tend to think their course

is better, the more flashy its subject matter, more experienced professors feel that it is the most basic and fundamental material that brings the most merit.

It was heartening to note that among the recent Ph.D. professors there were a few who seemed to recognize, right from the beginning, the special purpose of the program, and to adapt well to it. In some cases, I feel quite sure that this came in part from the fact that their graduate school courses had themselves focused on basics, so they were not really exceptions to the theorem, but very much appreciated nonetheless. In some other cases, I got the feeling that they simply had “natural economics” in their blood, and quite instinctively adapted their courses to the purposes of the program.

Over the period that I served at ISEG (until its untimely demise during the disastrous de la Rúa presidency), I had long meetings with the professors in the program, and explained its objectives many times. I think these conversations served a positive purpose, gradually nudging some of the courses in the desired direction. But the movement was slow, if not glacial, and the problem remained until the very end.

I am totally convinced that the problem exists throughout the developing world. In countries that desperately need hands-on economic talent, more than half of the talent they actually get might better be described as “hands-off” (in the sense of its reflecting perhaps lots of expertise, but **not** expertise that is very relevant or useful in confronting the problems and challenges that the countries’ ministries and agencies have to face).

Throughout the developing world, in special courses and in regular university programs, the problem exists and no doubt will continue to exist. It is a reflection of the ethos of our profession, of the way our professional journal literature has developed, of the incentives and requirements for promotion in our universities. Personally, I would love to see a “back-to-basics” movement in our entire profession, but that is another story. Here we are looking for a way to stimulate a back-to-basics movement in the teaching of economics in developing countries, and perhaps in advanced-country programs that are dedicated mainly to the preparation of economists who will work in and on developing countries.

To achieve this, our aim is to get the endorsement of a very distinguished panel of famous economists. Distinction and fame are important because, we believe, only in this way will individuals and institutions in developing countries be persuaded to make major changes. Out of this panel we would hope to derive three types of output.

1. A model curriculum for a two-year program.
2. “helpful hints”, “tricks of the trade”, “lesson of experience”. There would be a series of vignettes: indicating elements that it is sensible to include in such a program, but which are often (or even typically) omitted.
3. Useful critiques of existing textbook material, from the standpoint of such a program. These could be couched in the abstract, simply listing: a) topics often excluded that should in fact be included, and b) topics often (or typically) included that should probably be excluded. Alternatively, they could focus on one or more specific textbooks.

It is utterly essential to recognize the need to exclude materials from such a program. In a U.S. university, under the quarter system, a student typically takes 3 courses per quarter, meeting 3 hours per week for 10 weeks. That’s 30 hours per course; 90 hours per quarter. In a 2-year program that

means 540 classroom hours. If the courses meet 4 hours per week, we get to 720 classroom hours—for **everything**. There is no time for frills or luxuries in such a program. Something **has** to be left out. The underlying problem is that owing to the caprices of history, to the particular path that the evolution of our profession has taken, and to the “theorem” about how young professionals design and model their courses, a lot of what is left out of today’s actual programs consists of **basics** that should definitely be in them, while a lot of what is in the programs consists of **frills** that can (and should) readily be dispensed with.

I am including as an appendix to this proposal a “model curriculum” somewhat similar to the one we designed for ISEG in Argentina. One task that we would like to ask of conference participants is to look critically and carefully at this program with an eye to suggesting improvements. But any suggestions should bear in mind the constraint of 540–720 classroom hours for everything.

**I am also introducing two separate documents:**

1. “Can We Identify the Basic Tools Needed for Policy Analysis in Developing Countries?”

This is a paper I presented at the January 2007 meetings of the American Economic Association at a session organized by Anne Krueger. It expresses the same sense of malaise that motivates this proposal, and spins out some suggestions of a few subjects and ideas that I think should be included in a real-world, fundamental-based, policy-oriented program. I include it because it devotes enough space to a few main topics to be able (I hope) to convey something of the tone and spirit that I think (in addition to pure content) should characterize such a program.

2. “Contributions to a Sourcebook of Helpful Hints for Training Future Practitioners of Development Economics and Policy”

This is a series of “helpful hints” or “tricks of the trade” that I believe manage to convey important fundamentals in a direct and efficient way. The exposition is a bit terse, and I have not taken space to elaborate on the advantages that each vignette has vis-a-vis alternative, more traditional ways of dealing with the same material. One of the things we will want to do in our sessions is to examine critically not just these suggestions but also the sets of similarly-motivated vignettes that we hope will be contributed by the other conference participants.

The plan is to create a sourcebook of ideas for those who teach economics in a developing country setting, or with a developing country emphasis. Perhaps it could carry a title like “Making Economics Teaching More Relevant: A Sourcebook of Ideas From Leading Economists”. Even if this were only to be available online, it could help people get started in shifting their teaching emphasis toward a more basic, more robust, ultimately more useful curriculum.

**What Participants Should Bring to the Conference**

1. **Contributions to the Sourcebook**, helpful hints, tricks of the trade, lessons of experience that will help teachers in and on developing countries bring more fundamentals-based material into their classes. I would like to have perhaps 100 such vignettes to assemble into a sourcebook soon after the conference.
2. **Comments on the Model Curriculum** described in the appendix to this paper, including especially suggestions for its improvement. Once again we would like to have at the end of the

conference an improved model curriculum that most participants would be prepared to recommend.

3. **Detailed Outlines for Specific Courses.** These could consist of critical analyses of existing textbooks or of what a participant might characterize as a standard or typical treatment of a subject. The focus here should be on what new material to add (to concentrate on what is basic and important for policy-oriented work in developing countries) and what old material to subtract (in light of the time and resource constraints of the proposed program).

I have not been specific about the level at which such a program would be pitched—in part because I believe it will necessarily vary. I have no doubt that in Argentina, Brazil, Chile or Mexico one could think of program's being at a high master's or even ABD level (i.e., the coursework leading to a Ph.D. degree, but without the dissertation). This is because these countries have high-quality undergraduate economics programs capable of generating a steady flow of participants. In countries with lower-quality undergraduate training, one has to think of pitching the program at a lower level—perhaps an elite undergraduate program to compete with the existing ones; perhaps a lower-level Master's program to upgrade the training of existing graduates.

Of one thing I am quite sure. The fundamentals of economics represent an extremely rich lode, which can be mined again and again with great profit to the student. I guess the graduate courses in price theory that I took from Milton Friedman in 1947 represented my third or fourth pass at that subject, but those two courses still would probably rank #1 in terms of their contribution to my subsequent professional life as an economist. What we're after in this conference is to design a program that will help revitalize and make more relevant the teaching of economics in and for developing countries. I have faith that so long as we really focus on fundamentals, the level can easily be flexible.



# APPENDIX: RECOMMENDED 2-YEAR PROGRAM

## FIRST YEAR

### First Quarter

#### **Microeconomics I**

The economics of resource allocation: how the price system works, elementary applied welfare economics. To be covered: supply and demand; theory of consumer behavior, theory of the firm, market for productive factors, determination of factor prices.

#### **Macroeconomics I**

Basic economic aggregates; product, income, consumption, investment, capital, rate of return. Equilibrium in a closed economy. Introduction to open-economy macroeconomics—tradable and nontradable goods and services. Introduction to growth accounting and growth economics.

#### **Mathematics for Economists**

Basic mathematical tools that will be needed in the rest of the program and in later professional activities. Uses of differential and integral calculus in economics. Systems of equations. Determinants and matrices and their uses. Optimization under constraints. Dynamic optimization.

### Second Quarter

#### **Microeconomics II**

Resource allocation over time, capital markets and rates of interest, gross (marginal productivity) and net (time preference) rates of return. Risk premia, theory of risk and uncertainty. Basic cost-benefit analysis; externalities and public goods.

#### **Macroeconomics II**

The demand for real monetary balances. The consolidated balance sheet of the monetary system. Central Banks, international reserves, bank credit and the money multiplier. Public debt and the banking system. Practical exercises using basic data sources; International Financial Statistics, World Development Report, Human Development Report.

#### **Econometrics**

Review of basic statistical concepts (probability and probability distributions, analysis of variance, hypothesis testing). Sampling theory; stratified sampling. Bayesian techniques. Simple and Multiple Regressions. Essential elements of time series analysis. Special problems of cross-section analysis. Special problems encountered with panel data.

### **Third Quarter**

#### **International Economics**

Theory of how a small open economy is linked to the rest of the world. Tradable and nontradable goods. The gains from trade and the costs of trade distortions. Adjustment under different exchange rate systems; international capital movements. Banking and exchange rate crises. Sharp fluctuations in world market prices of principal exports. Country links to international institutions.

#### **Public Finance**

Taxes and Economic Efficiency. Estimating the costs of tax distortions. Taxes in a general equilibrium system. The incidence of taxation. Concepts of tax equity. Estimating the progressivity or regressivity of overall systems of taxes and expenditures.

#### **Economic Growth**

The breakdown of growth into its components. Measuring the contributions to growth of changes in labor force, labor quality, increments to the capital stock, the rate of return to capital. The influence of economic policies on the rate of growth. The role of norms, attitudes, and institutions. Empirical studies of why and how growth rates differ.

## **SECOND YEAR**

### **Fourth Quarter**

#### **Cost-Benefit Analysis (Applied Welfare Economics)**

Principles of applied welfare economics. Measuring the efficiency effects of monopoly, price discrimination, price controls, quotas, acreage restrictions, subsidies, quota-subsidies, taxes, import tariffs. Distributional weights. Basic needs externalities. The shadow price of government funds. The economic opportunity cost of capital. The economic opportunity cost of foreign exchange and of outlays on nontradables.

#### **Agricultural Economics**

The agricultural sector in developing countries. Patterns of land tenure and labor use. The forces of economic growth in agriculture. Experiment stations, extension services, agricultural colleges. Agricultural price, credit and marketing policies.

#### **Labor Economics**

Supply and demand for labor. Migration, regional labor markets. Wage differentials by occupation, skill, and education. Labor legislation and collective bargaining. Protecting worker rights while maintaining labor market flexibility. Measuring the private and social rates of return to investment in education. Modernizing traditional systems of education. Systems of unemployment insurance, disability insurance, social security (retirement).

## **Fifth Quarter**

### **Project Evaluation**

Mainly oriented toward the economic evaluation of public sector investment projects—roads, ports, irrigation, and electricity projects. Also covers basic principles covering the analysis of investments in general. Project profiles, correcting for inflation, issues of the scale and timing of projects. Separable components, interrelations among projects. Identifying key stakeholder groups and allocating benefits and costs among them. Estimating the economic opportunity costs of labor under normal conditions, under cyclical unemployment, under dual or otherwise distorted labor markets, under migration-fed unemployment.

### **Natural Resource and Environmental Economics**

The economics of exhaustible resources. Contracting for the explorations of a nation's natural resources. Royalties vs. other arrangements. Contingent contracts based on future discoveries and market developments. Policies with respect to forestry resources. Taxation. Replanting rules. Combating air and water pollution. Tradable caps as devices for obtaining market valuations for given pollutants. Fisheries economics and regulations. National Parks and Wildlife.

### **Transport, Communications, and Energy**

Dealing with urban congestion (a really big 21st century problem). Regulating telecommunications in the age of cell phones and the internet. Managing a national electricity grid. Simulating a competitive solution for generation via marginal cost pricing and a well-managed dispatch center. Need for independent control of transmission lines. Need for direct regulation of the margins of local electricity distribution companies.

## **Sixth Quarter**

### **Industrial Organization and Policy**

This is a difficult subject to address in a developing-country context, simply because so much of the existing literature is tightly bound to advanced-country institutions and history. I believe serious work has to be done to ferret out good examples of both success and failure of specific efforts by developing countries to deal with problems of industrial organization, regulation and policy.

### **Financial Sector Economics**

Issues of banking regulation, bankruptcy laws, international capital movements, direct investment by foreign companies, transfer pricing, markets in futures and financial derivatives.

### **Institutions in Developing Countries**

Law and Order. The Judicial System. Dealing with corruption. Modernizing and reforming the educational structure. Fostering mobility across socioeconomic strata. Deregulation to promote economic efficiency. Well-designed regulations to replace inefficient ones.







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# OBSERVATIONS ON THE SALVADORAN ECONOMY

PRINCIPAL THEMES PRESENTED AT A MEETING SPONSORED BY  
USAID AND FUSADES, SAN SALVADOR

MAY 2007

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USAID AND FUSADES, SAN SALVADOR

Arnold C. Harberger. University of California, Los Angeles.

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# OBSERVATIONS ON THE SALVADORAN ECONOMY

## INTRODUCTION

At the outset, let me inform some and remind other Salvadoran listeners and readers that I come to today's task as an old friend of this country. My first visit took place in the early 1970s (most likely in 1972) and I worked quite regularly here, under USAID auspices, during the rest of that decade. My next major stint of work took place in 1988–89, when I organized a team of foreign experts to study the economy of El Salvador, and then compile a series of policy suggestions that might be useful as a new president took office. Our visits spanned a period of over 6 months, prior to the presidential election. We met with all the candidates and all their economic teams. That election resulted in the installation of Alfredo Cristiani as President of El Salvador. From the standpoint of our own mission, which had its headquarters in FUSADES under the sponsorship of USAID, this was an extremely serendipitous outcome. The reason was that our Salvadoran counterparts (for our own studies) were all connected to FUSADES in one way or another, and it then turned out that President Cristiani selected many of them as members of his cabinet, as President of the Central Bank, and as technical experts. These and other members of President Cristiani's team were instrumental in implementing the important wave of economic liberalizations and other reforms that were carried out at that time. I believe that much of the subsequent success of the Salvadoran economy can be attributed to these reforms. I subsequently returned several times to this country, a few times at the invitation of FUSADES to update my own impressions and diagnosis of the economic panorama, and then several times in connection with the work of ESEN (Escuela Superior de Economía y Negocios), on whose Academic Advisory Board I serve.

Over the three-plus decade time span of these visits there is one topic that seemed always to be present—the real exchange rate. Let me recount to you two experiences—one from the latter part of the 1970s, the other from the late 1980s, to give you an idea of the persistence of this topic, and also how its specific form changed with the tides of history. Some of you will recall that the middle to late 1970s were a boom period in Central America, fueled in part by high coffee prices in the world market. In El Salvador, one manifestation of this boom was a rise in the general price level. What was the mechanism by which this came about? The first point to realize is that the rising price level of that time did not reflect a textbook-style inflation—with the Central Bank printing money to finance huge government deficits. No, the printing of money that occurred came as the Central Bank did exactly what it was supposed to do under a fixed exchange rate regime. It bought dollars at the stipulated rate of 2.50 colones per dollar. It thus had hard currency backing for the great bulk of its monetary emissions. What we were seeing in El Salvador at that time was not a standard inflation but a process of real exchange rate adjustment to an increased flow of foreign exchange earnings. If foreign exchange earnings increase by 5% of GDP, the Central Bank (with a fixed exchange rate) buys these dollars, thus expanding the supply of local currency base money. If nothing happened to adjust the economy in light of this new situation, the Central Bank might keep on buying dollars and expanding the money supply forever. But adjustment not only typically occurs—it occurs quite naturally and with no further help from the authorities. The way the process works is that the people receiving all

that extra money will normally not want just to add it to their bank accounts or stash it under their mattresses. They will want to spend at least some of it, and as they do so they will cause the country's imports to increase. As a consequence the Central Bank, instead of accumulating 5% of the GDP in increased dollar reserves, will add the dollar counterpart of maybe 4 or maybe 3 percent of GDP to its reserves. Of course the prices of nontradable goods will begin to rise as a consequence of demand pressure, and thus a price differential will appear, with imports looking ever cheaper as domestic goods prices rise. This causes people to divert additional expenditures from domestic goods to imports. Ultimately a new equilibrium will be reached, where the extra inflow of foreign exchange (5% of GDP in this case) is matched by an induced outflow of like amount (for additional imports in this case). Now the Central Bank is no longer a net buyer of dollars. What it buys from the extra export proceeds, it now sells to pay for the extra imports that have been induced by the process of real exchange rate adjustment. Adjustment is complete. But a critical part of the process of adjustment was the rise in the price of nontradables (which I also sometimes call domestic goods) relative to tradables.

Now we come to the key to the Salvadoran situation in the latter 1970s. This process of adjustment was underway, but in a context of a highly protectionist, highly restrictive import regime. When the access of the public to additional imports is artificially curtailed, it obviously will take a lot longer time, and will clearly also entail a much greater increase in the domestic price level (relative to the fixed exchange rate) in order to induce the needed increase in the demand for imports. As domestic prices rise, another force also enters the picture—the costs of producing exports increase—which in this case particularly hurt the (non-coffee) exports whose world prices had not increased. So an added element of adjustment appears—a decline in exports to the extent that these are squeezed out by rising domestic costs of their production.

Now the reason why I'm giving you this background is to recall a speech that I gave before a large audience like this one, in El Salvador, at that time. Almost every time I have come to this country since the late 1970s, somebody has reminded me of that speech; it seems to have established some sort of bond between many Salvadoran old-timers and myself. In that speech I drew the analogy of you being home alone, with a wild tiger racing around your house. What should you do to deal with that problem? "Open all the doors, open all the windows," I said, so the tiger will have the opportunity to get out of the house. The analogy is perhaps too vivid, but it certainly made the point. The tiger was the extra money that was circulating in El Salvador as a consequence of the coffee boom. The closed doors and windows were the restrictions placed on imports, impeding the escape of that extra money. The lesson—that the equilibrium price level would rise less from its starting point, the more decisively the country liberalized its import restrictions and controls—was plainly evident.

The second episode that I want to recount occurred during our 1988–89 visits to this country. In the course of our preparations, our team met not only with the candidates and their advisers; we also arranged numerous meetings with representatives of key interest groups—manufacturers, agriculturists, importers, exporters, teachers, civil servants, etc. In the course of those meetings, I was particularly impressed, and later very frustrated, by an opinion that we kept hearing from exporters and from export-oriented producers. These groups were obviously suffering at that time from the low price of the dollar (in real terms). What had happened was that the internal price level had risen significantly, while the exchange rate had remained constant at 5 colones per dollar. What we heard from these groups was a continual complaint against the Central Bank and against the government authorities more generally. The complaint ran something like this. "Here we are, suffering terribly in

economic terms, some of us going bankrupt, others near bankruptcy, and all because the Central Bank refuses to adjust the exchange rate. Don't they realize that they could bring real prosperity to all of us, if only they would raise the exchange rate from 5 to 8 or 10 colones per dollar? How can they be so dense, so unperceptive, and ultimately so irresponsible?"

We would hear this complaint time after time. And in each such case we took pains to explain that the situation was not so simple. Yes, the dollar was cheap in real terms, we would say, but it was cheap not because of mistaken policies by the Central Bank, but because the dollar was so abundant. What we were looking at was an equilibrium real exchange rate adjustment to a very big inflow of dollars, period after period. The big new actors in the scene were foreign aid and emigrant remittances. Each of these sources was contributing an annual flow of dollars equal to 5% or more of GDP—this on top of the traditional flow of dollars stemming from exports. So our retort to the complainers was that the low real price of the dollar was a natural outcome of the situation which the Salvadoran economy was living through. If they wanted a more expensive dollar, they should not look to the Central Bank to create one—they should go to the ultimate cause of the cheapness—namely, the abundance of dollars. In jest we said, but with a very serious purpose, "If you want a more expensive dollar, go to your government and tell them that next time foreign donors came offering foreign aid moneys, they should turn down those offers. And as far as remittances were concerned, we suggested jokingly that Salvadorans should write to their relatives, telling them to stop sending money." Of course, we didn't expect anybody to pursue such a course. Our jocular response was meant to drive home the point that the dollar was cheap in El Salvador for a very good reason—because of its abundance. To make it more expensive in real terms one would have to do something to reduce that abundance—something that the Salvadoran people were very unlikely to want to do. In the end one had to recognize that the cheap dollar was a reality, that it reflected a real economic equilibrium and that that real economic equilibrium would not be modified by such a simple action as raising the nominal exchange rate from 5 to 8 or 10 colones per dollar. To be sure, such a move would give some transitory relief to export interest groups, as the general price level adjusted to the new situation. But sound economics would predict that the ultimate effect of a rise in the nominal price of the dollar (starting from a position of equilibrium), would be a restoration of the same real equilibrium at a higher price level. Nowadays, to evoke this, use the analogy of being in a high-rise building, where every floor has an identical floor plan. The floor plan represents the real equilibrium of the economy, and successive floors represent higher price levels. So starting from an equilibrium with a fixed exchange rate of 5 colones per dollar and following the consequences of a devaluation to 8 colones per dollar, is like taking the elevator from the 5th floor to the 8th floor of the same high-rise building. The floor plan (the real equilibrium) is the same after the event as before it.

In fact El Salvador had tried something like this experiment in 1986, when it raised the nominal exchange rate from 2.5 colones to 5.0 colones per dollar. In that episode it took only about 18 months for the price level to double, and for something quite close to the initial equilibrium to be restored.

## **TODAY'S SCENARIO—EMIGRANT REMITTANCES**

If emigrant remittances were an important element explaining a dollar that was cheap in real terms in 1988–89, they are practically the whole story today. Some may ask, looking at today's picture, how can there be an exchange rate problem, when we really have no exchange rate (in a dollarized economy). The answer is that the real exchange rate is present just as much with dollarization as without it. Adjustment takes place via movements in the internal price level (relative to what is

happening in the outside world). A cheap dollar in real terms means a relatively high internal price level, an expensive dollar would come with a low internal price level. Salvadorans should be grateful that fate has not thrust upon them the need to crunch the economy to a new equilibrium at a much lower price level. Such adjustments (England in the 1920s, Chile in 1981–82, Argentina leading up to the crisis of 2001–02) are extremely painful and are invariably characterized by huge problems of unemployment.

In 2006, emigrant remittances are reported to have amounted to some 18% of GDP, and as of my present visit, they are projected to be at least at that level, and perhaps even at 20% of GDP for 2007. This phenomenon has altered the economic situation of the country in a number of ways. But the first point to be made is that the remittances and the events giving rise to them have represented a tremendous plus for the Salvadoran nation and its people. Perhaps the most impressive bit of information on this score is the fact that the earnings of the approximately 1.5 million Salvadorans in the United States amount to more than the entire GDP generated within the geographic boundaries of El Salvador.

This gives rise to an interesting set of comparisons. One has, first of all, the gross domestic product (GDP) of the country. This, in 2004, amounted to \$15.8 billion. Then, we have the GDP augmented by the remittances received. That brings the 2004 total to \$18.3 billion. And finally, we have the estimated worldwide income of Salvadorans, which in 2004 amounted to \$35.8 billion.

One can also consider the rate of growth reflected in each of these three concepts. On the first concept, locally-produced output (real GDP) grew by a little less than 4% per annum. If remittances are added, the growth rate (1990–2004) grows to a bit more than 4.5%. In 1990, the approximately 500,000 Salvadorans in the United States are estimated to have had total earnings of somewhat less than \$5 billion. In 2004 the approximately 1.5 million Salvadorans in the U.S. earned somewhat more than \$20 billion. The growth rate of these earnings is about 14% per year in nominal terms, over 10% in real terms. Adding overseas earnings to nominal GDP in El Salvador we get a figure of \$35.9 billion in 2004 compared with around \$9 billion in 1990. In real terms, correcting each part with its own price level, the real growth rate of this aggregate was over 6% per year.

Obviously, these figures represent a very positive evaluation for Salvadorans taken as a group. It is very hard to see in such results any basis for negative responses to these developments. (Of course, this does not deny that there have been losers from these experiences—particularly Salvadoran families which did not receive significant amounts of remittances from abroad.)

The flow of remittances clearly brought a new-found sense of economic security to many recipient families. This has had the effect of making some family members less willing to engage in painful, backbreaking labor, like planting and harvesting of crops. The result has been a degree of pressure in the labor market for unskilled and low-skilled labor, generating a gap that has been partly filled by migratory labor from Guatemala, Nicaragua, and Honduras. At the same time the attractions of the U.S. labor market have operated to draw many semi-skilled and skilled migrants out of the Salvadoran market, leaving elements of unsatisfied demand for these labor categories. Once again, migrants from Guatemala, Nicaragua and Honduras seem to have responded, thus filling many of the empty places left by the Salvadoran out-migrants.

As an economist I was sort of pleased to learn of all these happenings. To us as professionals, it is reassuring to see that not only do the laws of supply and demand work, but they work in ways and

through channels that most casual observers might not expect. In short, market forces are not only strong; they are also often quite subtle.

One issue that came up in our general meeting, and also in many conversations throughout my visit to El Salvador, was the question, what is the future of our remittance flows? Sometimes this question was couched in terms of a perceived downturn in the construction industry in the U.S., where an important segment of Salvadoran migrants are occupied. My first reaction to this question was not to deny the possibility of some downward fluctuations in the flow of **remesas**, but not to see in it a problem of huge dimensions. Think of **remesas** on the one hand versus the flows of dollars coming from coffee exports, oil exports, copper exports, beef exports, etc., on the other. Countries whose foreign exchange flows depend mainly on those commodities have often seen huge swings, even from year to year, in the nation's total foreign exchange earnings. We should not forget that even oil was selling only for around \$10 a barrel only a few years back (in 1998).

Thus it is easy to find cases where oil proceeds or coffee proceeds or copper proceeds or beef export proceeds fall by twenty or thirty percent in a single year. For me, it is hard to imagine Salvadoran remittances falling by even as much as 10%. There are many reasons for this. First, while construction actually is a volatile component of every country's GDP, and while there is a certain concentration of Salvadoran migrants in that industry, that concentration probably does not exceed 10% of all Salvadoran workers in the U.S. (or perhaps 20% of Salvadoran male workers in the U.S.) Thus, even if construction activity were to fall by half, the effect on total earnings of Salvadorans now in the U.S. would almost certainly be less than 10%.

To this must be added a demonstrated fact of absolutely critical importance—the tendency of migrants to move to places where their friends and relatives are already installed. This “friends and relatives multiplier,” discovered by students of migration more than half a century ago, is one of the most profound constants to be found, as people have tried to explain international migration. Friends and relatives at the point of destination may not weigh too much in the decisionmaking of U.S. citizens to move from one state or city to another, because life is not likely to be very different for them, going from one point to another in the same country. But migrants from abroad are likely to be literally “lost” if they move alone to a city where they have no friends or relatives, while they are likely to have their arrival celebrated with a party, then be sheltered and fed for a while, then be guided and mentored through the intricacies of the housing and labor markets, of how to find the best shopping bargains, of how to keep clear of the law. These benefits from the presence of friends and relatives are obviously of great value to international migrants. The migrants themselves have proved as much over the decades, even over centuries, as they have made their migratory decisions. Historically, this tendency is what made Boston a city of Irish, Portuguese and Italian immigrants, New York the destination of Italians and Jews, Milwaukee a haven for Germans, and Minnesota the goal of Scandinavians. More recent migrations have shown similar patterns—Salvadorans to Los Angeles, Florida, and Washington, Haitians and Dominicans to New York and Florida, etc. Mexicans have gravitated to different U.S. cities, depending on where they came from in Mexico. The dominant refrain here is that new migrants tend to go to where old migrants already are installed.

No evidence on this subject is more persuasive than the record of recent migration from Central America to the U.S. We now have in the U.S. a Salvadoran population equal to over 20% of the number of Salvadorans in El Salvador. The corresponding number is about 12% for Guatemala, 7% for Honduras, and 6% for Nicaragua. How can these disparities be explained, when income per capita is higher in El Salvador than in the other three countries. The force of attraction of the Salvadoran

population in the U.S. is clearly the most plausible explanation—especially so since 2/3 to 3/4 of all Salvadorans now in the U.S. have come since the end of the civil conflict, and **since** the onset of prosperity in El Salvador.

Now look at the matter from the standpoint of migrants **into** El Salvador. In the first place, over a million such migrants have come in, just from Guatemala, Honduras and Nicaragua in the period 1997–2004. This net movement of Guatemalans and Hondurans just to El Salvador alone was almost as large as the total population of Guatemalans and Hondurans in the United States, as of 2004.

In each of the cited cases that same mechanism, the “friends and relatives multiplier” seems to be very strongly at work.

Where does all this lead? To me the main conclusion to be drawn is that the friends and relatives multiplier will continue to operate, and that the natural tendency would be for the population of Salvadorans in the U.S. to keep growing in the years to come. Stricter border enforcement and employer sanctions may operate in the other direction, but it would take an utter sea change in enforcement to make much of a dent in the magnetic attraction of the friends and relatives multiplier to bring ever greater flows of new migrants into the U.S. Hence, my own bottom line from this discussion is that I doubt very much that the flow of remittances will drop at all, and feel very confident that if a drop should indeed occur, it will very likely be modest in size and short in duration. Salvadorans, then, have little or no reason to fear that a crisis situation will develop, arising out of a sharp drop in remittances.<sup>1</sup>

## ECONOMIC GROWTH

Part of the stimulus for my visit to El Salvador came from a rather widely-held perception that somehow that country’s rapid economic growth had petered out, and that maybe the country would wallow in stagnation during the years to come. Growth, however, picked up its pace in 2006 and seems on track to be over 4% (in real terms) again in 2007. This is a good performance by international standards but does not compare to the rates of over 6% that were achieved in the wake of the economic reforms and transformations of the early to middle 1990s.

My first comment here is a lesson from the analysis of economic growth. It just is not true that a high rate of growth in one quinquennium or decade is a reliable predictor of a high growth rate in the next such period. Quite the contrary, this period’s growth is in general a poor predictor of next period’s growth. Such predictability as there is stems from the less volatile components of the growth rate—the rate of increase of the workforce and the country’s rate of investment (as a fraction of GDP). The first of these is stable simply for demographic reasons (and in the case of El Salvador by the out-migrants to the United States being virtually replaced by in-migrants from Guatemala, Honduras and Nicaragua). The second of these forces derives its relative stability from the country’s rate of saving (low in El Salvador, but not highly volatile). The sharpest discrimination to determine whether a growth episode will be rapid or slow, however, comes from real cost reductions (improvements in total factor productivity). It is strong real cost reductions that predict successful growth episodes, and weaker ones that predict a relatively listless economy. And only rarely do high rates of real cost reduction create an atmosphere in which the following quinquennium or decade will see a repeat

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<sup>1</sup> The data on migrations reported here came mainly from *Informe sobre Desarrollo Humano, El Salvador 2005*, esp. Tables 1.7, 2.1, 4.3 (San Salvador: UNDP, 2005).

operation. In general, from period to period, real cost reductions come in totally different sectors of the economy, are originated by totally different people, and consist of totally different elements (different inventions, different technical improvements, different underlying ideas).

El Salvador's economy benefited in the 1990s as the economy recovered from the years of conflict, leading to benefits from all components of growth—more labor, more capital, higher rates of return, greater economic efficiency (real cost reductions). Once the economy reached the new, higher level dictated by peace plus policy reforms, it required new elements of impetus to keep the growth rate high. I believe I perceive this to be happening; I think that the recent uptick of GDP growth to the 4% per annum range reflects this new impetus. But real cost reduction cannot be expected to “normally” contribute more than 1 to 2 points of economic growth per year. In El Salvador the relative predictable components of growth are an actual labor force growing at perhaps 1 to 1 1/2 percent per year and a rate of gross investment of about 1.5% of GDP. To get labor's impact on growth, we multiply the labor force growth rate by labor's share in GDP (about 1/3 in El Salvador). To get capital's contribution to growth we multiply the ratio (net investment/GDP) by the gross-of-depreciation rate of return that is expected to be generated by that investment. A 15% gross investment rate probably reflects net investment of around 7-1/2%. To this I would apply an expected real rate of return of 15 to 20 percent. Thus I would expect a labor contribution to growth of about 0.5% (1.5% labor growth x a labor share of 1/3), and a capital contribution to growth of 1.1 to 1.5 percent per year (= net investment rate of 7.5% times a gross-of-depreciation rate of return of 15 to 20 percent). Add to these contributions a rate of real cost reduction of between 1 and 2 percent per year and you end up with a range of 2.6 to 4 percent per annum. So I am not surprised with the actual rates of growth we have seen in recent years. I feel the recent surge of growth to 4% is very welcome, and (happily in a sense) within the more-or-less normal range of 1–2 percent per annum for the real cost reduction component. (If that were to reach 4 to 5 percent, we could be quite sure that that rate would not be matched over a longer haul.)

## THE CHINA SYNDROME

When people study the world economy in our present era, it is hard to fail to see that the elephant in the room is and has been (for the last decade or more) China. Let me start by saying that China's spectacular growth of 10% or so per year, in real terms, is indeed another outlier among the world's growth experiences, but it is something that I feel we can readily understand. The big key to China's huge growth has been investments fueled by a huge savings rate among the Chinese people, and by massive movements of capital in the form of direct foreign investment. In recent years China's rate of gross investment has been about 45% of GDP, with net investment being around 35%. Apply to this a gross-of-depreciation rate of return of 20% (probably an underestimate) and you already have explained 7 points of the country's growth rate. Add to that a significant amount of real cost reduction that was brought in (in the form of more modern techniques) along with the foreign direct investments and you get close to the observed 10% growth rate. An added element in the Chinese case (which is typically present but not of major importance in other countries) is the massive and rapid shift of labor from low-productivity activities in the rural sector to much higher-productivity activities in the urban sector of the economy. This element, which some accounting approaches will assign to the labor contribution to the growth rate, and other approaches will count it as part of the real cost reduction (increase in productivity) component, has been particularly important in the case of China, where the recent migrations from farm to city are said to be the largest migratory movements to have taken place in the entire history of the human race.

The reason for going into this amount of detail about China's growth rate is in part just so readers will understand it, and see that, though an outlier, it still fits into our analytical schema, but in the main it is to convince you that the particular tricks that made for China's great growth are not easily transported into the Salvadoran scene. One can be quite sure that it would be a real achievement for El Salvador to bring its gross investment up from 15 to 20 percent of GDP, which by our estimates would add about one point to the annual rate of growth. And its hard to imagine a labor contribution much higher than 0.5% per year or a real cost reduction rate (over the whole economy) of more than 2% per year. So Salvadorans should not sniff at a 4% growth rate as if it were something miserable—actually, it is quite a nice performance. And it is something that could be made even nicer if the rate of investment were to be stepped up to, say, 20% of GDP.

Before I close this discussion of China, let me bring into view an added element that may help readers to better understand the realities that El Salvador has had to face and will continue to face in the foreseeable future. This element concerns the fact that the Chinese economy is in large measure a competitor of the Salvadoran economy insofar as export markets are concerned. El Salvador is like Mexico in this respect. Both of these economies had evolved into being significant exporters of low-end manufactures, of both the integral-production and the **maquila** varieties. As China's economy developed, it became the world's fastest growing source of low-end manufactures of both varieties. Not only did Salvadoran and Mexican firms have to compete with a flood of cheap Chinese exports in world markets, it also turned out that a number of Salvadoran and Mexican firms actually shifted their production operations to China. Small wonder then, that these two Latin American economies have had to work hard to achieve rather ordinary economic growth in recent years. And while I emphasized the case of China, we should not forget that India, Indonesia, Malaysia and Thailand are also adding significant amounts of low-end manufactured exports to the same world market.

Contrast El Salvador and Mexico with Chile in the same recent period. Chile exports copper, lumber, salmon, wine, table grapes, other fresh fruits and vegetables. These products are all demanded by China and some of the other growing economies of Asia. While for Mexico and El Salvador, each added percentage point of Chinese growth is another headache, for Chile it represents another blessing.

There can be no doubt that Chile has had the best package of economic policies of any Latin American country, and surely one of the best in the entire developing world. Some important component of Chile's successful growth surely stems from this source. But also we must recognize that not all of Chile's recent performance has come from its good policies. Some has surely come because of the complementarity of Chile's economy with that of China and other rapidly growing Asian nations.

## THE ROLE OF POLICY

Economic policy reform has been important in enabling the Salvadoran economy to perform as well as it has, and in spite of the special difficulties it has had to confront. But readers should be aware that good policy can create an environment that is friendly to the forces of growth, or one that is distinctly unfriendly. Once policy has created a favorable environment, it then becomes the task of economic agents to uncover fruitful avenues of investment, to assign or attract the necessary funds and to year after year keep finding new ways to reduce real costs.

El Salvador probably now has (after Chile) the second best economic policy package in Latin America. Certainly it ranks in the top quarter of Latin American countries in this regard. This means that most of the major flaws of economic policy that existed in earlier times have been corrected. International trade has been greatly liberalized, the tax system modernized, the regulatory structure has been rationalized and simplified, the economy has been dollarized.

Surely there are further steps that can be fruitfully taken, and that will do their part in adding to the efficiency level of the economy. Further tuning of the tax and regulatory systems can still be done; the climate for small business can still be improved, and above all the spending side of the government's budget can be rationalized. But these remaining reforms will not set in motion a great spurt of growth such as occurred in El Salvador in the 1990s. They more likely may add a fraction of a point to the growth rate over a period of years.<sup>2</sup>

In my opinion, by far the most important reform to be implemented is the creation of a national system of project and program evaluation. The purpose of such a system is to bring under more rational control the expenditure side of the government's budget. The sad truth is that El Salvador set in motion such a system in the early 1990s, but it subsequently fell into disuse and ultimately disappeared. I believe that system was restricted to public investment projects, and did not extend to other spending programs. Whether or not a new system should be similarly restricted is an open question. In my opinion the answer depends on where in the government hierarchy the system should be located. My own opinion is that the budget office is the best location, and if the program is located there, its scope could quite naturally be as broad as the budget itself.

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<sup>2</sup> I have a problem in communicating the verities of growth, because many people have acquired a mindset on this subject which is totally at variance with reality. Spurred on by what they read in the press and what they see on television, they somehow expect that simple moves of policy should have a big influence on the growth rate. When a country experiences growth at the rate of 6 or 7 percent per year, the government in power is almost certain to claim credit for that result. And when a country experiences only 1 or 2 percent growth you can be pretty sure that the party or parties out of power will blame the government for the result, and often promise that if only they were elected, they will create growth at a 6 or 7 percent rate. Rarely are these claims accurate—yes, a very bad economic policy can cause low or even negative growth for a period, and correcting a very bad policy can bring about a nice spurt of higher growth, but normally a country's growth rate is determined mainly by forces outside the government's direct control.

To get a better sense of reality in this topic, consider the following imagined scenario. The U.S. government decides to hire the entire economics profession for three years, and charge them with finding policy measures that will raise the country's GDP growth rate. The 100,000-strong profession responds, works hard for three years and comes up with policy changes that cause the growth rate to rise from its otherwise level of 3% per annum up to 3.1%, and to stay at 3.1% for just 5 years, after which it falls back to 3%.

To the average politician, to the average television commentator, to the average newspaper writer or editor, and in all likelihood, to the average citizen, viewer and reader, this seems a pittance of a result of so much work. "The elephant labored long and hard, and then brought forth a mouse," some would say. "Economists never have clear answers to anything, what can you expect?" would be the comment of others.

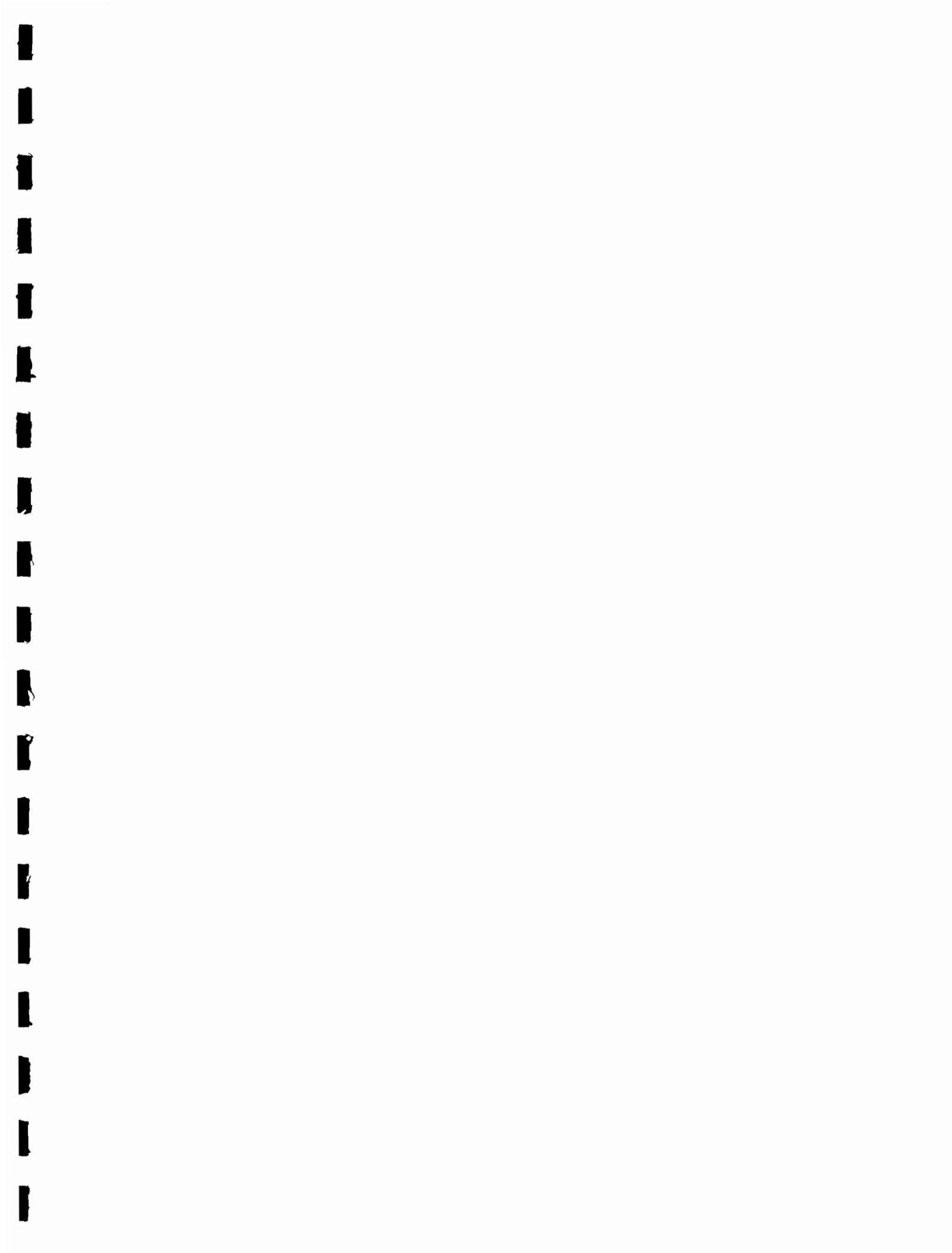
Now to the truth. Think of the growth path of the economy without the economists' suggestions. It starts at, say, 100, and then rises at a compound interest rate of 3%. Then, with the economists' recommendations, the growth path diverges, going beyond the original path by 0.1% the first year, 0.2% the second, 0.3% the third, 0.4% the fourth, and 0.5% in the fifth year. After that the new time path stays half a percentage point above the old one, on and on into the indefinite future. The present value (at a real rate of 5%) of this sliver of extra product turns out in a simple calculation starting in the fifth year, to be  $.005GDP5 / (.05 - .03) = 25\%$  of the fifth year's GDP. Twenty-five percent of today's GDP is more than 3 trillion dollars. This compares with an annual salary bill for the entire economics profession of probably no more than ten billion dollars, or a 3-year cost of no more than \$30 billion. The benefit-cost ratio of this huge and expensive effort, with such an apparently minor impact on the growth rate, would be (at a 5% discount rate) something like 100 to 1. Those who think that we can easily impact growth permanently, raising the rate permanently from, say, 3 to 4 percent, must have in mind benefit-cost ratios in the stratosphere. (The present value of moving the growth rate from 3 to 4 percent indefinitely, is equal to 50 times the initial GDP, evaluated at a 5% rate and is equal to 5 times the initial GDP evaluated at a 8% rate.) Policy reform typically reflects fruit that's ripe for the picking, but it would take an incredibly productive reform to give us a bump upward of one percentage point in our permanent growth rate.

Another reason to locate a system of project and program evaluation in the budget office is the fact that the budget office already possesses a certain degree of authority to control the quantity and quality of government spending. The use of the criteria of cost-benefit analysis to impose a certain amount of systematic discipline on government spending is a natural implementation of the budget office's existing responsibility and a natural extension of its existing activities.

One key piece of advice that I feel constrained to give is that the development of such a national system of project and program evaluation must be extremely well planned, especially with respect to personnel and training. The leader of the program must be a person who is totally in command of the methodology of cost-benefit analysis. He or she must be capable of teaching that methodology at a high university level, and must be capable of supervising all the details of analysis over the whole gamut of public projects and programs. In addition this leader should have the communication skills to explain to ministers, presidents, and the public at large exactly why a bad project or program fails to meet the cost-benefit test. Also that person should have the courage to do battle with the strong interest groups and other political forces that are always present among the key advocates of a bad program. A person with all these characteristics is hard to find, but getting the right person is critical. If one has to wait to accomplish this, a wait of one or two years would almost certainly be quite worthwhile.

Quite possibly linked with the search for the leader of the program, but also totally necessary in its own right, is a plan for the systematic training of the analysts who will actually do the work of cost-benefit analysis. These people are needed not only in the place (e.g., the budget office) where the final report card on a project or program is drawn up. For the system to be effective, such experts should also be present in the ministries and agencies that undertake public projects and programs. Even in the legislature it is wise to have cost-benefit experts, so that mistakes of concept and design can be nipped in the bud, even before a draft law is brought up for consideration.

A model for a Salvadoran training program would be the one that has been functioning at the Catholic University of Chile for some 30 years. Initially started with a grant from the Inter-American Development Bank, its financing was within a few years taken over by the Chilean government and continued uninterrupted under four successive presidential administrations. The course initially was of one academic year's duration but was subsequently shortened by a couple of months. Its director from the beginning was Professor Ernesto Fontaine, whose presence on the Chilean scene has yielded huge dividends for the Chilean economy and people. Professor Fontaine has helped get similar efforts started in a number of Latin American countries (including the 1990s program in El Salvador). I believe it would be extremely wise for the government to engage his collaboration and advice in setting up both the new program at the governmental level and the new training program to provide the needed talent and expertise.







**USAID**  
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# TRIP REPORT FROM EL SALVADOR

**JUNE 2007**

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# TRIP REPORT FROM EL SALVADOR

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

Arnold C. Harberger, University of California, Los Angeles.

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# TRIP REPORT FROM EL SALVADOR

My recent trip to El Salvador spanned the period 29 April-5 May 2007. My base during this period was in the offices of USAID, but more than half my time was spent on meetings elsewhere—in the offices of FUSADES, in the meeting rooms of the Radisson Hotel, in the Central Bank, at the UNDP headquarters in San Salvador, at the offices and lecture halls of ESEN, etc. Most of my time in these meetings was spent receiving orientation concerning the recent history and present state of the Salvadoran economy. The purpose of these briefings was to give me as good and up-to-date information base as possible, for the major presentation that took place on Wednesday, 2 May, at a meeting sponsored by USAID and FUSADES. My remarks at that meeting are summarized in a separate document, “Observations on the Salvadoran Economy”, and will not be repeated here.

In this document I present some further, more informal impressions, plus some remarks on a few topics not covered in “Observations”. The absolutely first thing to say about my trip was the general impression of economic prosperity that one gets upon arriving in the country. Automobiles clog the streets more than ever before, and one is surprised to see how many of them are new or of very recent vintage. The stores and shopping centers are well stocked with goods from all over the world, and are well populated with shoppers. Restaurants abound, and appear to be prospering. My hotel was bustling with guests, meetings, conventions, etc.

All this is easy to understand once one takes into account the great importance of remittances. Broadly speaking, the receipt of remittances becomes “effective” for the economy only when that receipt leads to an excess of total spending over total production. That phenomenon, in turn, carries with it the signs of prosperity that one was observing.

One phenomenon that is worth noting is that real wages apparently have not risen very much, in spite of El Salvador’s prosperity. One can only speculate about the economic forces underlying this—but one thing seems **very** clear. The flood of migration from Guatemala, Honduras and Nicaragua **into** El Salvador has approximately matched the flood of Salvadorans to the United States. Hence the tightness of the labor market that we would expect from such a big exodus simply did not appear—the outflow being substantially offset by the new inflow of people. Add to this the downward pressure on low-end manufactures stemming from the huge surge of Chinese and other Asian exports of this type (see the section on “The China Syndrome in my “Observations” paper), and you probably are getting pretty well along in explaining the sluggishness of unskilled and semi-skilled wages in El Salvador.

It is interesting to speculate on exactly what groups are hardest hit by the whole congeries of recent developments. My own best guess would be that Salvadoran low-income families who are **not** recipients of remittances from abroad would constitute one big category. Perhaps one would find another among the immigrant workers from the rest of Central America—though these people are probably significantly better off than they were back home, say, in Guatemala or Honduras.

## **POLITICAL UNCERTAINTY**

One of the principal brakes on the growth process in El Salvador in recent years has been the element of political uncertainty. By this I do not mean uncertainty concerning which party will win the next election. One finds that type of uncertainty in almost every successful modern democracy. The uncertainty to which I refer is uncertainty about whether the framework of laws, regulations, enforcement procedures, etc., under which an economy is currently operating will, as a result of the next election, be totally overturned or at the very least undergo major negative change.

I have for a number of years made a major effort to recognize and praise the left-wing parties of a growing number of countries, as those parties one after another abandoned their old platforms (reflecting varying degrees of collectivism and populism) and made strong moves to embrace the policy lessons that economic science has to offer. Felipe Gonzales in Spain, Bob Hawke in Australia, Carlos Menem in Argentina, Tony Blair in England, and a string of concertacion presidents (Aylwin, Frei, Lagos, and Bachelet) in Chile are excellent representatives of the type of transition I am referring to. Basically their move has been to embrace rather than fight the market economy. Their thought has been to allow the process of growth to flourish rather than placing impediments in its path.

The problem in El Salvador lies apparently with the FMLN. Strangely, when they were belligerents in the country's civil strife, they appear to have had the sympathy of a number of competent professional economists. What appears to have happened is that after renouncing belligerency and becoming a political party, they have shunned the advice of these economists, even to the point of expelling some (all?) of them from their ranks.

The result is an FMLN organization that is more ideological in its positions, less heedful of the lessons of economics, and obviously more of a danger, as perceived by those contemplating investments in the country. The problem is one of great worry and heightened uncertainty for these investors (foreigners and Salvadorans alike). Not knowing what a victorious FMLN would do, after the next elections, investors chose to limit the amounts of capital they were willing to commit to the country. This accounts for the low rate of investment that we see in El Salvador. Indirectly, it may also account for the high rate of return on capital that has prevailed in the country for quite some time. Clearly, if the rate of investment had been significantly higher over the past ten or fifteen years, El Salvador's capital stock would be a lot larger today. This would have given rise to a lower equilibrium real rate of return on this capital stock.

## **THE RATE OF RETURN TO CAPITAL**

In the meeting with representatives of the Economics Ministry, the main presentation was done by Juan Carlos Rivas. In addition to giving a panoramic view of the income and outlays of the government and of key demographic and social indicators, he brought to the table a significant updating of earlier work on the nation's real stock of reproducible capital, and on its estimated rate of return. I believe this work is an important contribution to the understanding of the Salvadoran economy; thus I will present a synoptic version here.

As background, I can report on the results of a study that I did, in 1993, of the rate of return in what I called the "reduced private sector". This sector was defined as the whole economy, minus the government sector, minus the residential housing sector. It had a real rate of return of a little over 20% in the early 1970s. This dropped to about 17% in the middle 1970s, then fell to 6-7% as the civil

conflict erupted. By the late 1980s, however, it was up around 20% once again, and with the arrival of peace it boomed to over 30% in the early 1990s. A later study by Juan Carlos Rivas followed up on my work. He found that this “reduced private sector” rate of return stayed above 30% up through 1996.

A later study by the Economy Ministry measures the rate of return to all capital in the economy (including infrastructure capital and housing). This rate of return was reported at around 20% in the late 1990s, declining to a little over 17% in the period 2001-2003. I attempted a rough calculation of the rate of return to capital in the “reduced private sector”, using data from the Economy Ministry study and other sources. On this basis I obtained a real rate of return of close to 25% for the “reduced private sector” for the most recent years that were covered.

Readers should not place much weight on this particular number. The time is ripe for a very careful study of capital and the rate of return, so as to improve our understanding of the entire capital market situation of El Salvador. The main point that I would like to emphasize here is that the observed real rate of return to capital remains high in El Salvador, in spite of its high degree of integration with the world capital market and in spite of the package of liberalizing reforms that have been put into place over the past 15 years or so. One contributing factor that helps explain this high rate of return is the political uncertainty that potential investors perceive and undoubtedly take into account as they make their investment decisions; indeed, often decide not to invest because of the perceived uncertainty. Dare one hope for a “conversion” of the leadership of El Salvador’s political opposition to an embrace of sound economic principles, even as they promise such items as better education, better health care, and greater opportunity for those in the lower socioeconomic strata?

## **A NOTE ON DOLLARIZATION**

The subject of dollarization is not an easy one. To begin with, readers should recognize that it can be good for some countries and not for others, and that within any one country it can be good during some periods and problematical during others.

Before entering into details, let me state at the outset that I believe that up to now El Salvador has only reaped benefits from its decision to dollarize. It is clear that interest rates have moved downward—close to international levels—as a result of dollarization. This stems from international and Salvadoran investors perceiving much lower country risk (and effectively zero currency risk). As a consequence, more outside money has come to the Salvadoran capital market, and less Salvadoran money has diversified into foreign accounts and holdings, than would have been the case without dollarization. As a consequence it is likely that investment in this country has been a point or two higher than it would have been, causing the average growth rate in the post-dollarization period to be perhaps as much as a half a point higher than it might have been without the dollarizing move.

These good words about dollarization can easily lead readers to think that it might well be good for everybody, everywhere and all the time. But that is not the case. It all goes back to the endless debate between proponents of fixed and advocates of flexible exchange rate systems. There are good arguments for both sides and against both sides, and there are certainly many real-world situations in which a country could opt for either system without much cost.

In the traditional debate proponents of fixed exchange rates argued that the discipline of such a system was a useful safeguard operating to dampen the temptation of policymakers to follow an

inflationary course. (This assumes, of course, that inflation is kept under control in the country [e.g., the U.S.] to whose currency the peg is attached.) Here the evidence is clear from the experience of the Central American countries, and of countries in Africa and Asia that maintained ties to the British pound or the French franc. In general, during the periods in which fixed exchange rates were successfully maintained, these countries' inflations stayed low—pretty much following the rate of world inflation as reflected through their partner currency. A disadvantage of fixed exchange rates comes from the difficulty of the authorities to deal with speculative attacks and other situations that call for devaluation of the currency. It is hard to tell when a devaluation is in fact called for by the underlying circumstances; fixed-rate authorities must in any case steadfastly deny any consideration of the alternative of devaluation, even up to the very last minute. Meantime, speculators reading the evidence can start to bet on devaluation, leading to a run on the currency that will always be hard, often impossible to stop. The tighter is the “fix” in a fixed-rate system, the smaller becomes the risk connected with capital flight and speculative attacks. Thus, from this point of view a currency board (in which in principle the only financial asset held by the board [or Central Bank] is the partner currency) is better than just a plain fixed exchange rate, and, of course, dollarization (or its equivalent for Euros or pounds) is even better. But these systems lose out in circumstances where a devaluation is really the best policy option.

What is the alternative to devaluation when the fix cannot be broken? Standard economics tells us that price deflation will accomplish the same goal. A huge drop in the world price of a major export like oil or copper, or a quick reversal of a big inflow of capital (say because of the results of an election, or the prospect of a particular electoral outcome)—both these events can easily call for the real exchange rate to depreciate by 50%. If we define that rate as  $E \bar{p}^* / \bar{p}_d$ , where  $E$  is colones per dollar, is  $\bar{p}^*$  the world price index of tradable goods (measured in dollars) and is  $\bar{p}_d$  the general price level of the country concerned, one can think of the needed adjustment to be an upward move (depreciation) of that real exchange rate. If the rate is flexible,  $E$  can readily move from 5 to 7.5 colones per dollar, thus accomplishing most of the task. But under a hard fix of the exchange rate, the general price level of the country would have to go down from, say, index 100 to index 66.7. There is no case of any such adjustment having been successfully accomplished under a fixed-rate system; except perhaps in times of substantial world inflation, when the increase  $(\bar{p}^* / \bar{p}_d)$  of was accomplished mainly through a rising  $\bar{p}^*$ .

Three important episodes for which serious deflationary adjustment was allowed to proceed under fixed exchange rates were: a) the United Kingdom in the 1920s, b) Chile in 1981–82 and c) Argentina in the years leading up to its major currency crisis of 2001–02. In each of these cases the economy suffered through a spate of serious economic depression, and in each of these cases the end result was in any case a devaluation of the nominal exchange rate. The reason why there are few examples of long and painful suffering while adjustment is being made to a major negative balance-of-payments shock, is that most countries do not wait as long as the U.K. or Argentina, before they devalue, nor do they permit the unemployment rate to reach 25% or more (as it did in Chile) before biting the bullet and opting for devaluation.

To my mind this disadvantage of fixed exchange rate systems is real and ever present. But different countries face very different odds of it happening. Panama, the standard bearer for dollarization in this hemisphere, is a wonderful example. Its major source of foreign exchange revenue has from the very beginning been connected with the Panama Canal. And I'd be surprised if there is any country in the world that faces a lower probability than Panama, of a major decline in its regular flow of foreign

exchange earnings. It is as if Panama had from the beginning been vaccinated against a major negative balance-of-payments shock.

El Salvador is not in the situation of Panama. Back when coffee was its major source of foreign exchange earnings, it was quite in the opposite category, being highly vulnerable to a sharp fall in the world price of coffee. To some degree that vulnerability still exists, but to a much lesser degree owing to the huge decline in the relative importance of coffee as a source of foreign exchange. To my mind, the whole panorama has changed dramatically with the huge rise in the importance of emigrant remittances. I have argued<sup>1</sup> that these are unlikely to fall substantially, in any short period of time. Thus, quite fortuitously, the flood of **remesas** has reinforced the positive benefits of dollarization and reduced its major vulnerability. At this level of observation, the decision to dollarize seems to have been a good one, not only looking at the experience up to now (which is clearly positive) but also looking to the future and taking due account of potential downside risks.

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<sup>1</sup> See my "Observations in the Salvadoran Economy," USAID (June, 2007).





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# THE NICARAGUAN ECONOMY: SITUATION AND PROSPECTS

BASED ON REMARKS PRESENTED AT A CONFERENCE SPONSORED  
BY USAID, MANAGUA, NICARAGUA

**AUGUST 2007**

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Arnold C. Harberger, University of California, Los Angeles.

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# THE NICARAGUAN ECONOMY: SITUATION AND PROSPECTS

It is more than a little challenging to come before an audience of leading figures in Nicaragua's economy and society, and to try to bring new information to them, on the basis of barely ten days of current exposure to the realities of an economic situation that most of them have been living through and observing for years. I have decided to try to face this challenge by focusing on what we economists call the breakdown of the growth rate of an economy. The analysis of growth in this framework is something with which I am very familiar, having worked in this area for close to half a century, and being the author of a recent monograph on the subject,<sup>1</sup> which incidentally was written under the sponsorship of USAID.

One of the benefits of studying a subject for a long time is that this experience imparts a sense of perspective, and a basis for comparing a given situation to a whole range of past experiences. So, to start, let us set Nicaragua's experience against a background of what was happening elsewhere.

By the "breakdown of growth" we mean its division into components due to different causes. The simplest breakdown creates a component due to incremental capital, a due to incremental labor, and a final component due to real cost reduction. The first of these measures incremental capital as net investment; its expected contribution to added GDP is then found by multiplying net investment by its expected rate of return. The second component measures incremental labor by the increase in the labor force; its expected contribution to GDP is found by multiplying this increment by the average real wage. These two components typically account for only a part of the observed growth; the remainder comes from many other causes, including new inventions and economies of scale, improved average quality of the labor force, better management techniques, reallocating of labor and capital from low productivity to high productivity uses. All these are conveniently lumped under a general heading, usually called "improvement in total factor productivity", but preferably, and more simply, labeled "real cost reduction." I like the term real cost reduction because: a) everybody understands it; b) it represents what business people and managers are constantly striving to bring about, and c) it calls attention to the important truth that real cost reduction typically takes place at the level of the productive enterprise.

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<sup>1</sup> Arnold C. Harberger "On the Process of Growth and Economic Policy in Developing Countries," Washington (USAID), December 2005.

**TABLE 1: RECENT GROWTH EXPERIENCES**

	Annual Rate of Growth	
	Of GDP	Of GDP Per Capita
	1990–2003	
World	2.5	1.4
Less Developed Countries	4.3	2.0
Latin America and Caribbean	2.4	1.1
Nicaragua	2.8	0.9

Source: UNDP Human Development Report, 2005, Table 14

Just as economic growth can be measured on the one hand as a certain number of real dollars or real cordobas and on the other as a percentage rate of growth, so its division into components can be handled in the same way. It is more meaningful to do the breakdown in terms of the rate of growth, because the resulting figures can then be easily compared across countries as well as across different periods for the same country. When we do the breakdown in this way, the first component (capital's contribution to the growth rate) is measured by the share of net investment in GDP, multiplied by the expected rate of return on that investment, and the second component (labor's contribution to the growth rate) is measured by the share of labor income in GDP times the rate of growth of the labor force. This measure of labor's contribution is based on the assumption that the average quality of the labor force remains constant. Thus it counts as part of the labor contribution to growth all the education, training, and skill acquisition that is needed to bring each new cohort up to the average pre-existing skill level. Education and skill improvements beyond this are measured, under this method, as part of the productivity improvement (real cost reduction) term. This term, of course, is found simply by subtracting the capital and labor contributions to growth from the actual observed GDP growth rate of the period in question.

In my study of recent growth experience, I focused on what I called "successful growth episodes". These were defined as periods of five or more years, during which a country's GDP growth rate averaged at least 4%. To ensure that the entire period was successful, we also required that growth be at least 4% during its beginning and ending years. We took our data from the International Monetary Fund's **International Financial Statistics (IFS)**, excluding only: a) countries from the former Soviet bloc, because of their special circumstances, b) very small countries, because of their size, and c) countries for which the data reported in IFS were incomplete. After these exclusions, over 100 countries remained. Scanning these countries for the 41-year period 1960-2001, we found only 59 episodes that met our criteria for "successful growth". Notably, neither the United States, nor the United Kingdom, nor Germany experienced even one episode of "successful growth" under this definition. I do not take this to mean that these three economies performed badly over those 41 years—all of us know better than that. I take it instead to underline the fact that our criteria of "4% annual growth for 5 years or more" is a stringent criteria, one that we should not expect will **typically** be met, even in a well-functioning economy.

This brings me to an important initial point. People should realize, much more than they seem actually to do, that a real growth rate of 4% is quite an achievement. It is not something that can be counted on by a government simply "doing the right thing" in economic policy. We must recognize that the economic growth that we measure in our GDP data takes place at the level of the firm—the productive unit of the economy. It is there that capital and labor are added to make their respective

contributions to growth, and it is there that the various forces that make for real cost reduction actually do their work.

## A DIGRESSION IN GROWTH EXPECTATIONS, STRUCTURAL ADJUSTMENT AND THE “WASHINGTON CONSENSUS”

How many of us have heard laments and complaints, saying that we have failed in our efforts to foster economic development, that the structural adjustments sponsored by the IMF, the World Bank, USAID and other bilateral and multilateral assistance agencies had represented a blind alley in the quest for growth and development, that the Washington Consensus had been tried and found wanting? Certainly I have heard and witnessed such complaints, many times. And not only in tirades by populist demagogues, but even in respected think tanks in Washington, D.C.

I find such complaints to be nothing short of absurd. They fly in the face of all the evidence. The mystery is how such complaints got started in the first place, and why their fires didn’t quickly sputter out in the face of overwhelming evidence.

**TABLE 2: SOME NOTABLE IMPROVEMENTS SINCE 1970**

Year	World	Developing Countries	Latin America & Caribbean	Nicaragua
<b>Life Expectancy</b>				
1970–75	59.9	55.8	61.1	55.2
2000–05	67.0	64.9	71.7	69.5
<b>Infant Mortality (per 1000 live births)</b>				
1970	96	109	86	113
2003	54	60	27	30

All the relevant indicators —GDP, GDP per capita, life expectancy, infant mortality—have improved for the world as a whole, and for the developing countries. Of the major regions, only Africa has lost ground in terms of GDP per capita and even it has improved slightly in terms of life expectancy and infant mortality (in spite of civil wars and the HIV-AIDS pandemic).

If one compares the most recent 25, 30, 40, or 50 years with comparable-length earlier periods, one finds that no similar-length period in all of human history has been as successful as the recent past in terms of economic growth, increased longevity, improved health, reduced infant mortality and escape from poverty.

Why, then, do we hear so many complaints against economic reforms, the Washington Consensus, the IMF, the World Bank? Indeed, it is easy to show that the champions of progress have all shifted their policies in the directions of reform suggested by the international institutions and the technocrats of economic policy. Champions of growth like China, India, Korea, Indonesia, Spain, Portugal, Ireland, Brazil (in the “Brazilian miracle” period), and Chile, have all moved their policies toward, not away from the Washington Consensus as they moved into and through their periods of rapid growth. So, too, though to a lesser degree, have most other countries, if we compare the most recent 20-30 years with prior periods.

My principal answer to these puzzling questions of “Why the complaints?” is that people somehow have approached the problem with exaggerated (and I would say totally unrealistic) expectations. For most countries, it is realistic to think of gross investment being around 20% of GDP, with around half of that representing depreciation of the existing capital stock. That leaves net investment at around 10% of GDP. If to this we apply a rate of return of 15%, consisting of 10% net return plus 5% to cover depreciation,<sup>2</sup> we get a capital contribution to growth of 1.5 percentage points per year. In advanced countries the share of labor in GDP is around 2/3 and the rate of growth of the labor force is typically less than 1% per year. Here the labor contribution to the growth rate ranges only about 0.5 percentage points per year (and is much lower than that where population growth is especially slow). In the developing countries, the rate of labor force growth is typically faster, but the share of labor in GDP is lower. Here a labor contribution to growth of around 1% per year would represent a good central tendency (based on recent rates of labor force growth). Thus the capital contribution and labor contribution together might account for economic growth in the range of 2 to 2.5 percent per year. Anything above that has to come from real cost reduction (productivity increase).

That leaves the rest of the work up to what we have called “real cost reduction”. This component of the economic growth rate is the one that varies most as between good times and bad in a given country, and as between episodes of high and low growth at a given time among different countries. Owing to its huge variability from time to time and from place to place, it is hard to pin down something that we might call a normal rate of real cost reduction. Nevertheless, I would be prepared to say that a country that manages to achieve real cost reduction at the rate of 1 to 1.5 percent per year over a period of several decades should consider itself fortunate. It was within this range for the U.S. over the entire 20th century, and for the U.K. during the period 1960-2000. In most periods of notably low growth, real cost reduction tends to turn negative. Recessions tend to be characterized by negative real cost reduction almost of necessity, as net investment is still on the positive side in such periods, and output typically falls by a larger percentage than employment. As a result, the biggest component of a recessionary drop in output is usually a strongly negative contribution of real cost reduction.<sup>3</sup>

So, getting back to the main thread of my story, a “normal” growth rate of 3-4 percent per year might be composed of a labor contribution of 0.5-1 percentage points, a capital contribution of 1-1.5 percentage points and a contribution of real cost reduction of 1-1.5 percentage points.

When they hear this, some people react by generally asking, what about China and the Asian Tigers in their extended periods of rapid growth? Do not these experiences somehow belie the judgment that it is hard to generate economic growth beyond the range of 3-4 percent per year? My answer is that any country is invited to try to imitate these growth champions, but most will find that task to be very difficult, if not impossible. The characteristic that most distinguishes China and the Asian Tigers (Hong Kong, Korea, Malaysia, Thailand, Singapore) is their extremely high rate of gross investment—almost always more than a third, and often over 40% of their GDP. Gross investment of

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<sup>2</sup> Depreciation is included because we are explaining the growth of GDP, which is a gross-of-depreciation concept. Our results would be the same if the breakdown of the 15% gross rate of return were different—e.g., 11% net return plus 4% for depreciation, or 9% net return plus 6% for depreciation.

<sup>3</sup> There are two mutually compatible ways to visualize this phenomenon. One is that declining demand drives firms “back to the left” on their short-run average cost curves, leading to rising average costs. The other is that firms typically practice “labor hoarding” in recession periods, keeping much of their labor force intact rather than risk the costly process of training replacements when laid-off workers find other jobs.

35% of GDP means net investment in the order of 25%. Multiply this by a gross-of-depreciation rate of return of 20%, and you already have a capital contribution to growth equal to 5 percentage points per year.<sup>4</sup>

The Asian Tigers achieved their high rate of investment in part by having huge rates of domestic savings, and in part by attracting large amounts of foreign direct investment. Their high savings rates, in turn, were the product of high personal savings, high business saving and high government saving (excess of government revenues over current expenditures). High personal saving rates stemmed in part from traditional behavior, but also in very important measure from the rapid growth of the economy itself, together with the conservative norms that are typical of most East Asian families. As their incomes grew, they tended to save much of each year's increment. Consumption moved up, to be sure, but more slowly than income. This behavior created a "growth dividend" in the form of extra savings, that then were largely used to help finance the countries' high rates of investment. High business savings resulted from the high profit rates that were characteristic of these countries, and that then were largely reinvested. High government savings resulted from austere behavior by the governments concerned, which led to public investment averaging over 10% of GDP.

The answer, then, to questions about the experiences of China and the Asian Tigers is that their growth rates are indeed outliers, when compared with other countries, but they are not mysteries. These experiences are understandable in the light of our framework of growth analysis. Their most outstanding feature is the combination of a very high rate of investment plus a high rate of return on that investment. Beyond that there has typically been a high rate of foreign direct investment. Real cost reduction has also contributed importantly to their high rates of growth, but not at rates that are greatly out of line with successful growth episodes in the other countries.

The bottom line on China and the Asian Tigers is that their magnificent growth performances are not hard to understand, but very hard to imitate. It still remains true that 3% per year represents a good growth performance for most countries, and 4% per year a quite outstanding one.

## **COMPARING NICARAGUA'S GROWTH EXPERIENCE WITH THAT OF OTHER LATIN AMERICAN COUNTRIES**

In analyzing growth experiences, it is useful to distinguish periods of recovery from other periods in which the element of recovery is absent. The reason for this is that when a country finds itself in a state of cyclical recession or balance-of-payments or banking crises, it is almost certain to have gross domestic product at well below its previously observed peak. Recovering to that previously achieved level is typically easier than forging new ground beyond the earlier peak. Thus, when looking at Nicaragua's recent experience we will deal separately with the recovery period (1993-98) and the subsequent period of more normal growth. In selecting a set of situations with which Nicaragua's

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<sup>4</sup> In my "On the Process of Economic Growth and Economic Policy in Developing Countries", I estimated the capital contribution to growth by applying a 15% uniform gross-of-depreciation rate of return to capital to the estimated rates of net investment in all countries. The purpose of this was to have a clear, unambiguous, easily understandable methodology in a study that covered many countries from all parts of the world. It was not within the scope of that study to make individual analyses of the situations of all the separate countries. One can think of that study as a panorama, viewed from a distance. Studies from close quarters will improve our vision and understanding beyond what the long-distance view imparts. Work on the individual Asian Tiger countries reveals rates of return to capital that are significantly higher than the 15% gross-of-depreciation rate employed in my panoramic study. In my "Reflections On Economic Growth in Asia and the Pacific," the following median rates of return (net rate of return plus 5 percentage points for depreciation) were found. Korea: 21.3%, Malaysia, 21.6%; Taiwan, 20.9%; and Thailand, 19.8%. *Research in Asian Economic Studies*, v. 8 (1996), pp. 13-44.

experiences can be compared, I have chosen the 23 high-growth episodes within Latin America, on which I report in Harberger (2005). I have divided these into two groups—nine episodes reflecting periods that consisted mainly of recovery from a previous slump, and fourteen episodes of growth that was mainly “forging ahead”. The group representing the recovery phase will be compared in Table 3 with Nicaragua’s experience from 1993 through 1998 (when real GDP first surpassed its immediately-preceding peak of 1983). The experiences of successful growth in more normal periods will be compared in Table 4 with Nicaragua’s history since 1998.

To obtain the estimates for Nicaragua in Tables 3 and 4 we followed procedures similar to those used for the other countries and reported in Harberger (2005). The methodology there used is described on page 33 of that publication. For the Nicaraguan data, the labor contribution was estimated using exactly the same assumptions, a share of labor in GDP equal to 0.5, multiplied by the rate of growth of the employed labor force.

Considering that the comparison experiences in Tables 3 and 4 were all high-growth experiences and thus represent ambitious targets, Nicaragua’s growth record for 1993–98 and 1998–2000 does not look bad. But by the same token it is not on a par with the episodes reported for the other countries. Looking for the reasons for the shortfall, one quickly focuses on the right-most column in each table—that for real cost reduction. Here Nicaragua’s case falls 1.5 points short of the median of the comparison cases in Table 3, and 2.9 points in Table 4. There appears to be a degree of sluggishness in this area which invites questioning and examination.

**TABLE 3: LATIN-AMERICA HIGH-GROWTH EXPERIENCES—RECOVERY PHASE, COMPARED WITH NICARAGUA, 1993–1998**

Country	Year	GDP Growth Rate	Capital Contribution	Labor Contribution	Real Cost Reduction
Argentina	1990–98	6.4	1.1	1.0	4.3
Chile	1975–81	6.9	0.8	1.2	4.9
Chile	1983–98	7.4	1.9	1.2	4.3
Colombia	1985–95	4.5	1.1	1.7	1.8
Costa Rica	1983–99	5.1	1.2	1.6	2.3
El Salvador	1989–95	6.0	1.1	1.2	3.1
Mexico	1995–2000	5.4	1.1	1.2	3.1
Peru	1992–97	7.1	1.6	1.5	4.0
Uruguay	1990–98	4.4	0.9	0.6	2.9
<b>Median</b>		6.0	1.1	1.2	3.1
Nicaragua	1993–98	4.7	1.8	1.3	1.6

Data for other countries are from Harberger (2005). Data for Nicaragua are based on International Monetary Fund, *International Financial Statistics Yearbook, 2002* for GDP growth rates and rates of gross investment, and on Banco Central De Nicaragua, *Compendio de Cuadros Estadísticos 1994-2004*, Table 26, for Employed Labor Force.

**TABLE 4: LATIN-AMERICA HIGH-GROWTH EXPERIENCES—NORMAL GROWTH PHASE, COMPARED WITH NICARAGUA, 1998–2006**

Country	Year	GDP Growth Rate	Capital Contribution	Labor Contribution	Real Cost Reduction
Brazil	1960–80	7.3	2.7	1.6	3.0
Colombia	1960–80	5.4	1.6	1.4	2.4
Costa Rica	1961–79	6.5	1.7	2.0	2.8
Ecuador	1969–81	8.4	2.4	1.4	4.6
El Salvador	1964–78	4.9	1.3	1.7	1.9
Guatemala	1960–80	5.6	1.1	1.4	3.1
Honduras	1974–79	8.9	2.3	1.8	4.8
Honduras	1960–68	6.0	1.9	1.4	2.6
Mexico	1960–81	6.8	1.9	1.8	3.2
Nicaragua	1960–77	6.3	1.0	1.7	3.6
Paraguay	1960–81	6.7	1.7	1.5	3.2
Peru	1960–74	5.3	0.9	1.3	3.2
Uruguay	1974–80	4.8	2.3	0.3	2.2
Venezuela	1960–65	6.2	0.9	1.6	3.7
<b>Median</b>		6.3	1.7	1.6	3.1
Nicaragua	1998–2006	3.8	2.5	1.1	0.2

Source: Data for other countries are from Harberger (2005). Data for Nicaragua are based on Banco Central de Nicaragua *Annuario de Estadísticas Económicas, 2001–2006*, and *Compendio de Cuadros Estadísticos, 1994–2004*.

In thinking about the real cost reduction term, readers should realize that by its method of calculations it is a residual. It is found by starting with the observed rate of growth of GDP, and subtracting from it the separately-calculated contributions to growth of capital and of labor. There is little reason to question the measurement of the labor contribution. It is obtained by applying the fraction of GDP going to labor (taken as 0.5 for all cases in Tables 3 and 4) times the rate of increase in the employed labor force. There is little chance of serious miscalculation of the latter figure, and we must recognize that an error of 10% (in that average rate of increase over the whole of each period) would only cause the average labor contribution to growth to change by a little over a tenth of one percentage point.

To estimate the capital contribution, a different but basically compatible methodology is followed, time and data limitations having prevented an exact replication of the earlier method. Here, we followed the earlier method in assuming that half of GDP accrues to labor.<sup>5</sup> This leaves the other half of GDP, which does **not** go to labor. From this we want first to sequester that portion accruing to land, as distinct from reproducible capital. For a country like Nicaragua it is reasonable to consider half of the value added in agriculture to represent the contribution of land as such. In addition we also have the contribution of land to the “housing” industry—not the construction of houses but the

<sup>5</sup> Some readers may wonder, why not simply take the recorded wages bill of the economy as labor's share. The answer is that this leaves out important segments of labor's contribution—the work of the self-employed, the work of owners and their family members on farms and in unincorporated enterprises, plus the labor employed in much of the so-called gray or informal economy. These items are far too important to leave out, yet very difficult to estimate precisely. The rough figure of a labor share of 0.5 is compatible with what we know of developing countries, taken as a group. Our estimated labor contribution to growth is not very sensitive to this number, for it would be very surprising for the true labor share to differ from it by more than 0.1 in either direction.

provision of services from the existing stock of dwelling units. In addition we have to allow for the contribution to GDP of mining land and the mineral rights under it. For the first of these, we take 1/3 of the value added in the “housing” activity as recorded in the national accounts. For the second we take half the gross value added attributed to the mining sector.

Table 5 details the relevant shares as reported by Nicaragua’s Central Bank. It can be seen that they have maintained a remarkable constancy. Our attributions to the three excluded sectors are based on the averages shown in Table 5, i.e.,  $(1/2 \times 20.1) + (1/10 \times 6.6) + (1/2 \times 1.0) = 11.2\%$ . Deducting this figure from the 50% non-labor share of GDP, we get 38.8% as the gross-of-depreciation share of GDP attributable to reproducible capital. This represents a 15% return on a reproducible capital stock equal to almost exactly 2.6 times GDP. It implies, of course, that depreciation is equal to 12.9% of GDP.

To get the capital contribution for the period 1993-98, we take the average ratio of gross investment to GDP for the years 1993 through 1997 (= .25), reduce it by the calculated ratio of depreciation to GDP (= .129) to get the average rate of net investment for the period (= .121). This we multiply by the assumed gross-of-depreciation rate of return to reproducible capital (= .15) to get our estimate of the capital contribution to the average annual growth rate of the period (= 1.8%).

To get the capital contribution for the following period (1998-2006) we take the average ratio of gross investment to GDP for the years 1998 through 2005 (= .298), and again subtract .129 to account for depreciation. This yields a rate of net investment of .169. To this rate we apply a gross-of-depreciation rate of return of 15%, to get a capital contribution of 2.5% per year.

**TABLE 5: SHARES OF AGRICULTURE, “HOUSING”, AND MINING IN NICARAGUA’S GDP**

Year	Agriculture	“Housing” (= Propiedad de Vivienda)	Mining
1994	19.8	6.6	0.6
1995	20.3	6.6	0.7
1996	20.9	6.6	0.8
1997	20.0	6.7	0.9
1998	19.2	6.7	1.1
1999	19.0	6.5	1.3
2000	20.5	6.5	1.0
2001	20.4	6.6	1.1
2002	20.2	6.6	1.2
2003	20.3	6.6	1.1
2004	20.5	6.5	1.2
2005	20.1	6.5	1.0
2006	20.0	6.4	0.9
<b>Average</b>	20.1	6.6	1.0

Source: Central Bank of Nicaragua—*Summary of Statistical Tables*—Table 3, and *Anuario de Estadísticas Económicas 2001–2006*, Table 1-1, (p. 3).

## CHECKS ON OUR CALCULATIONS

Before going on, we pause to make a further check on the plausibility of the growth scenario that we have described for Nicaragua. We have assumed a gross-of-depreciation real rate of return of 15% on investment. Standard practice in growth analysis attributes this same rate of return to the existing stock of reproducible capital. If we follow this same assumption, we consider the return to reproducible capital of .388Y to represent a return of 15% on the existing stock of such capital. Thus that capital stock must be equal on average to 2.58 times GDP—a number that lies well within the plausible range of variation of the reproducible capital/GDP ratio in developing countries.

Pursuing our check further, we note that our estimates of the rate of net investment are .125 for the earlier period and .173 for the later one. This means that on average the reproducible capital stock was growing at annual average rates of  $.125/2.58$ , or about 5% in the first period and of  $.173/2.58$ , or about 7% in the second one. These are quite plausible rates of capital growth, considering Nicaragua's relatively high rates of investment—around 1 1/2 times the average of the comparison countries' experiences.

The picture we have built of Nicaragua's economy in the recent period can be subjected to one final check—to see whether it implies a rate of return to “business capital” that is in the plausible range—i.e., neither implausibly high nor unreasonably low. To perform this check we must first extract the “non-business” portions of the reproducible capital stock. These consist principally of government capital (infrastructure) and residential housing.

To estimate the stock of public sector capital, we relate it to the average rate of investment. Over the period 1994–2005 public investment averaged almost exactly 7% of GDP, while total investment averaged almost exactly 28%. Thus, of a total stock of reproducible capital equal to 2.58 times GDP, we attribute  $0.64 \times \text{GDP}$  to infrastructure capital.

To estimate the stock of housing capital we start with the share of GDP (6.6%—see Table 5) representing the flow of services rendered each year by the existing stock of housing. This flow represents a combination of the real rate of return and the real rate of depreciation of the housing stock. To be on the conservative side, we will assume here a 6% measured real rate of return (net of depreciation) on the housing stock.<sup>6</sup> This rate implies a housing stock equal to 1.1 (=  $.066/.06$ ) times a year's GDP. Thus we have business capital equal to (2.58 minus 0.64 minus 1.10) times GDP or 0.84 times GDP.

The return on this capital would be obtained as follows. Start with .388Y as the gross-of-depreciation return to reproducible capital in the national economy. Reduce this by .066Y to eliminate the net-of-depreciation return to housing. Reduce it further by .129Y to eliminate depreciation over the entire capital stock (public plus business plus housing) and you get .193Y as the net of depreciation total return to business capital. To get the rate of return, we divide this number by 0.84Y—our estimated stock of reproducible business capital. The resulting figure is 23%. This is a high number by broad international standards, but it is comparable to rates of return to business capital that have been estimated by similar procedures for El Salvador and Mexico.

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<sup>6</sup> This implies a depreciation rate of less than one percent per year, but readers should recognize that many parts of the residential housing stock actually increase in real value over time. On the assumption of a 6% measured rate of return, we get a housing stock of about 1.1 times GDP. A rate of depreciation of 2% would mean a measured real rate of return of only 4 (= 6 minus 2) percent (which we find implausible), and would imply a housing stock equal to  $[.066/.046]$ , i.e., over 1.4 times a year's GDP (also implausible).

## A PICTURE OF THE NICARAGUAN ECONOMY

What emerges from the above exercise is not only a better understanding of where Nicaragua's growth has come from in the past decade and a half, but also a sense of what that economy looks like. In the analysis of growth (Tables 3 and 4) the outstanding features that distinguished Nicaragua from the comparison countries were: a) a higher capital contribution to growth on the one hand and b) a significantly lower contribution of real cost reduction on the other.

As we look behind the high capital contribution, we find that Nicaragua has had **both** a relatively high fraction of GDP devoted to investment **and** a quite high rate of return to business capital. As we look behind the relatively low rate of real cost reduction, we are led quite quickly to wonder about the ways in which economic policy and uncertain expectations might have contributed to this weakness.

The first point to be emphasized in all discussions of economic growth is that economic growth as such, and in particular the economic growth that is measured in our GDP statistics, takes place at the level of the productive enterprise. What we measure as GDP is simply the accumulation of all the value added in all the productive activities in the economy. Moreover, we can extend our breakdown of growth all the way down to the individual productive operation of the economy. It is at the level of the productive operation that added labor and capital make their contributions to growth. It is also there that real cost reductions take place.

How does economic policy come into the picture? The answer is that it has its impact not directly, but by way of all the individual productive activities of the economy. The fact that the influence of policy is indirect does not mean that it is unimportant. The easiest proof of the importance of economic policy is the disastrous experience of those countries where policy was truly bad and counter-productive. Nicaragua had such an experience in the period 1978–89, when total GDP fell by a third, and GDP per capita was cut by more than half.<sup>7</sup>

The worst cases of policy-induced economic decline combine several factors—high rates of inflation, widespread price controls and other interferences with a market-directed allocation of resources, high rates of insecurity of and government interference with property rights, and gross distortions of the nation's trade patterns.

To understand the ill-effects of high rates of inflation, one must realize that one of their principal outcomes is a lack of confidence in money, and hence a huge reduction in real cash balances ( $M2/P$ ). The counterpart of this is a reduction in the amount of real credit available to productive enterprises. Inflation thus greatly blunts the contribution of bank credit to the efficient operation of the economy in general, and to the channeling of natural resources into the most productive investments in particular.

But high inflation has other, possibly equally noxious effects. These stem from the fact that individual prices move upward with their own dynamics. Prices of fresh products (when not controlled) adjust rapidly, rents and public utility prices adjust slowly. Some product prices move relatively in step with the world inflation; others go up in big jumps, with stable or slowly crawling periods in between. All this impedes, and even in some cases virtually destroys the main function of relative prices as useful signals for resource allocation and for real cost reduction. High prices are supposed to be signals to

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<sup>7</sup> I am aware that other factors contributed to this huge decline, but it is a matter of substantial consensus among professional observers that economic policies played a very important role in precipitating and exacerbating the decline.

draw resources into those activities and thus augment supplies. Low prices send the opposite signals. Normally these signals carry a lot of information, and last for a significant period of time, allowing resources to move from places where they contribute less to the economy to other places where they will contribute more. Part of this movement takes place as business people find ways to reduce real costs—producing things that the economy values highly while using resources that have a low opportunity cost for the economy. All these beneficial functions of the price system are interfered with by the “noise” created by high inflation. The result is by now a well-recognized standard conclusion—high inflation greatly inhibits the process of economic growth, impeding investment itself, blunting its productivity (real rate of return) and making it even harder for producers to reliably discover ways of reducing real costs.

The effects of price controls and other attempts to second-guess the law of supply and demand are well-known. When prices are set below the level determined by supply and demand, less is supplied and more demanded. Unless a country spends large amounts of foreign currency to subsidize imports of the difference, one gets predictable consequences. Less, not more, of the price-controlled goods are made available to the consuming public. Also, typically only a fraction of the actual purchases of the controlled items takes place at the control price. The rest occurs in the black or gray markets that quite predictably emerge in such situations. And in these black markets prices are higher, not lower, than those that would have prevailed had the law of supply and demand been allowed to operate freely. Ancillary consequences of price control situations are the fact that those consumers and firms that do succeed in getting items at the favored price are often subject to long and uncertain waiting periods and also typically get less than they would like to buy (at that price).

Secure property rights are a key feature of any well-functioning market economy. Their importance is seen most directly if one focuses on the process of investment. Those who invest do so in light of the expected rates of return that each specific investment promises. Any risk of expropriation or loss through other policy shifts obviously makes people much more reluctant to invest in the first place. Moreover, since insecurity of property rights typically arises in some sectors more than others, not only is the amount of investment curtailed, but its pattern across activities, industries and sectors is distorted.

The widespread liberalization of international trade during the past few decades has greatly reduced, for many countries, the adverse effects of past gross interferences with the natural forces of comparative advantage. But there are still important trade barriers in existence, whose reduction or elimination remains a significant challenge to economic policymakers. Trade distortions create and support economic inefficiency in the following simple way: in a highly protected import substituting activity, an economy might spend 30 cordobas of resources to save a dollar of foreign exchange, while in an export activity subject to an export tax it might only take 15 cordobas of the nation's resources to produce a dollar. All economic distortions have analogous effect, but what makes trade distortions so conspicuous is the fact that there is hardly any economic unit more truly homogeneous than the dollar (or pound, or Euro, or yen) of foreign exchange. Why countries so often have effective prices for a dollar of foreign exchange that vary so widely from activity to activity, depending on precisely how and where that dollar is generated, have forever been a source of puzzlement to economists.

## SOME LESSONS FROM SUCCESSFUL COUNTRIES

I would like to emphasize the importance of having a good economics profession, and of relying on good economic advice and counsel. The economy is a highly complex organism, subject to many pressures and forces in an ever-changing world environment. There is no substitute for having a good endowment of economic talent, capable of manning the multiple battlefronts on which economic policy must operate. Sending people for the best possible training in high-quality international centers (something which Nicaragua's Central Bank once did on a quite extensive scale) is one prescription that deserves to be followed. Another is the development and nurturing of high quality training centers within the nation's borders. Unfortunately the benefits of these initiatives necessarily lie well into the future, but this only means that to achieve them requires a certain level of selflessness and statesmanship on the part of current governments.

A good economic profession can feed and support economic progress in many different ways. Through the press and other communications media, it can improve (at least to some degree) the economic savvy of the general public, rendering it less susceptible to the various viruses of populist rhetoric. At the level of legislation, it can help avoid major blunders, including errors both of concept and of drafting (leading to laws that unwittingly incorporate incentives to anti-economic behavior and results). At the level of public investment, it can, through the implementation of sound procedures of cost-benefit analysis, greatly enhance the productivity of such outlays, especially by helping to avoid "white elephants" (grandiose investment schemes that turn out to be a huge waste of public moneys.)

I would like especially to emphasize the role of a good economics profession in enhancing the degree of consensus among political parties concerning the basic policy framework within which economic forces can then freely operate. I will return to this point later under the rubric of political consensus, but here I want to note the special role of a good economics profession in bringing it about. What happens here is that political parties have economic advisers, drawn from the nation's cadre of professionals. When the country's economic profession is itself weak or lacking, opposing parties tend to build political platforms that stray far from the principles of good economics, and that are often characterized by the visceral appeal of strident slogans rather than reasoned analysis. When the country's profession is strong, the advice received by each major party from "its" economic experts will typically have passed through the filters of good economic analysis. This will automatically bring about a much closer convergence of views than would evolve in the absence of those filters.

In the United States, we have a good example of my point in the work of the Brookings Institution and the American Enterprise Institute. Both these organizations are academically-oriented think tanks, but it is generally agreed that Brookings has closer links to the Democratic Party, and that the AEI has greater influence on the Republican side. Yet the relations between these two entities are collegial and cordial; representatives of each are regularly invited to present papers and serve as commentators at conferences organized by the other. Most importantly, there is a great deal of common ground in the analyses done and the main conclusions reached by researchers at these two entities, when they undertake to study the same general problem.

A second example in the same vein is Chile. Here the degree of political consensus on the grand design of economic policy has been widely noted. Much less recognized has been the key role of the economics profession in bringing this about. In the numerous elections that have taken place since Chile's return to democracy, the struggles among the political parties have been quite intense—but **not** on matters having to do with the broad framework of economic policy. There has been no controversy

on the principle of an open economy, nor on that of a market allocation of resources, nor in the idea of an extensive privatization of what were previously public enterprises, nor on the idea of an independent Central Bank, nor on the rule of avoiding price controls and similar interferences with natural economic processes. In my opinion as a longtime (since 1955) observer of the Chilean scene, one of the most important elements contributing to this consensus has been that each of Chile's political parties has drawn its economic advisers from the same general pool—an economics profession of extraordinary quality and depth.

Perhaps the term political consensus is a bit strong. Certainly partisan differences on policy are plain to see, both in the U.S. and Chile. But differences do not extend to the broad framework of policy that sort of defines the economic system of the country. Looking for another way than “consensus” to describe what I have in mind, I would settle on the idea of left-wing parties embracing good economics.

There was a time when it was practically *de rigueur* for a left-wing party to stand for ideas and policies that ran counter to the lessons of economic analysis and economic science. The idea that a national economy can (or should) be “run” from the center, the idea that the government should play a major role in determining the prices of goods and services in the economy, the idea that actions like importing, exporting and investment should be subject to minutious government control and approval—these are only some of the most important notions that characterized the stance of the “old left” on economic policy matters.

I do not have the detailed history of how and where this pattern was broken. But it is widely agreed that Felipe Gonzales in Spain was an early exemplar of the new, modern trend. Hawke in Australia, Lange in New Zealand, and Blair in the United Kingdom are others. Some would add the U.S.'s Bill Clinton, whose economic policy performance met a very high standard. (The only argument there would come from the angle that Clinton's Democratic predecessors had also shown substantial respect for economic principles.)

In Latin America, Chile presents the outstanding example of left-wing parties with a great respect for the lessons of modern economics. In that case the **concertacion**, a coalition of left-wing parties, all representing long-standing opposition to Chile's military government (1973-89), inherited from that government a set of economic policies that had resulted from two major waves (1974-81 and 1984-89) of economic reform. The **Concertacion** could easily have proceeded to scale back, or even tear down the policy structure that had been thus created. But it did not do this. Instead it recognized the great positive effect this reformed policy setup had had on the economy. Far from tearing it down, the left-wing coalition proceeded to strengthen and reinforce it.

The effect of this upon expectations is perhaps the greatest dividend of the **Concertacion's** decisive embrace of good economics. Business people are always ready to invest in what they consider promisingly remunerative projects. But what happens under a bad policy environment is that they tend to require a very high expected rate of return (because of the perceived risk of policy change by this government) and a very quick payoff (because of the uncertainty of what the next government might do.) As a consequence, they fail to undertake a large chunk of investments that they would have been quite pleased to do under a more favorable policy environment and with more certain prospects for the long run. In Chile's case, there was no such cutting off of investment prospects. Business people have not discriminated against investments with long lives and long gestation

periods. They also, because of the security of expectations, have good access to both the local and world capital market.

The visible success of the Chilean economy has led to a series of cases in which elements of Chile's policy reform package have been adopted by other Latin American countries. Trade liberalization has spread throughout the hemisphere, though at different paces in different countries. Tax reforms similar to Chile's have been widely implemented. And Chile's system (or one quite like it) of individual retirement accounts has been adopted by the social security programs of a number of other Latin American countries. Important reforms along lines similar to Chile's have by now been made to some degree in nearly all countries of the hemisphere, being perhaps most thorough in El Salvador, Argentina (up to 2000), Peru and Mexico.

The challenge is to continue on the path of reform in those places where further work has to be done, and to everywhere pursue a degree of political consensus on the future framework of economic policy. Instilling confidence for the long term is still very much an open issue in Mexico and Peru, and of course even more so in Bolivia, Ecuador, Nicaragua and Venezuela.

## **A NOTE ON "THE MODEL" OF ECONOMIC LIBERALIZATION**

It is interesting how the labels of "El Modelo" and "Neoliberalism" pop up in my own professional life. When I go to economics conferences and meetings, or to give seminars at university economic departments, these words are rarely mentioned. As I go to more interdisciplinary settings in the U.S., they come up more often. And in my wanderings around Latin America they seem to be brought up most of the time. Somehow, the currents of Latin American opinion seem to have fixed on these two labels.

First let me say that I would not center my complaints on the labels as such. But I certainly would focus on the challenges and problems that drive the debates that these labels precipitate. I do not think that the guidebook is a listing of pet policies that should be followed like the Ten Commandments. Rather, I think of economic science and economic analysis as the ultimate guide, so far as the economic aspects of policy are concerned.

Consider "privatization", taken by many as a hallmark of the wave of modern reforms. What we economists say about privatization is that when done well, it typically has beneficial, positive effects for the economy in question. But it is often not done well. In Latin America we have seen both kinds of errors—public sector enterprises being sold for too low a price (to friends and relatives of the government), or for too high a price (where especially telephone and electricity enterprises have generated high prices by leaving the private buyer free to exact excessive, monopoly prices from the general public for an extended period of time). The economics profession condemns both of these errors. For the first, the correction is simply honesty and probity—definitely needed for good economic policy but not derived from economics as such. For the second the correction is to establish, ideally before a privatization is implemented, a regulatory environment which aims at producing, in cases prone to monopolistic exploitation, results similar to those of a genuinely competitive activity. Regulatory patterns capable of achieving this end do exist, and have been widely implemented, in industries like electricity and telecommunications.

Looking now at regulation as a separate topic, consider the case of electricity. The key "rule" does not come from a "model" or a label, but from basic economic principles. Where electricity can be

provided cheaply, it should carry a low price that reflects this fact, where, on the other hand, it is expensive to provide, electricity should carry a high price to reflect that fact. Consumers should not be led to treat as costly something that is truly cheap to produce, nor should they be led to treat as cheap something that is truly costly to produce. Turning this maxim into reality should be the object of regulation. In short, regulations should lead to prices that reflect real costs, and do so by rules that are clear and general, and only when the market by itself fails to achieve this aim.

Taxation is perhaps the policy area in which more progress has been made, worldwide, than any other, during the past half-century or so. People today find it hard to believe that coming out of World War II the U.K. had a maximum personal income tax rate of 95%, and the U.S. a maximum federal income tax rate of 91%. Such rates flew in the face of economic incentives, and they were rather quickly reduced. But the U.S. had a maximum federal rate of 70% on labor income until the early 1970s and on capital income until the mid-1980s. Today the maximum federal income tax rate is 35%. Generally, around the world, the rates of tax on corporation or enterprise income have come down from over 50% to a range of 25 to 40 percent.

All this reduction in income tax rates has been facilitated by the tremendous spread of the value-added tax (VAT). This tax, which was first adopted in France in 1953, has spread rapidly and widely to the point where it now raises more revenue, worldwide, than any other type of tax. Happily so, from the standpoint of economics, for it is probably the single major tax that interferes least with the efficient operation of the economy (at least when it is well-designed and well-administered). The argument that the value-added tax is to a degree regressive is not taken seriously by most public finance economists, because they recognize that the issue of progressivity or regressivity is appropriately applied not to each single tax but instead to the tax system as a whole, and even better to the system of all taxes plus those public expenditures that can reasonably be allocated across income groups.

## **OPPORTUNITIES PRESENTED BY CAFTA**

How does CAFTA fit into the picture of growth prospects for Nicaragua's economy? We start again with the basic picture of a hierarchy of investment opportunities facing a nation during a given period. The hierarchy starts with the investments with the highest prospective yield, and works down in order of progressively declining yields until some cutoff point is reached, below which there is no willingness to invest.

What CAFTA does is add to the prospective rate of return of some investments. At the same time it also, through its opening of new markets for some products, brings some totally new investments into the hierarchy of those with prospectively acceptable yields.

In general one should expect from CAFTA a broad panorama of possibilities for export expansion—in agriculture, in agro industry, in textiles, in maquila operations in general, and in light manufactures. What activities will end up as items of comparative advantage for the economy cannot be determined in advance. It will rather be the outcome of the forces determining the equilibrium real exchange rate of the economy, and the ingenuity of Nicaraguan entrepreneurs and foreign investors on finding combinations of productive technology on the supply side and market niches on the demand side, that together will make new operations viable in Nicaragua's economy.

What can economic policy do to help in this process? One should recognize at the outset that bureaucrats have no claim to be better than business people in finding areas for good investment. Picking winners in the economic world is not at all easy—witness the fact that most mutual funds do not succeed in beating their corresponding stock or bond market averages. And past efforts have mostly failed, where governments have tried to choose in advance particular economic sectors or activities and to provide them with special incentives or credits. That is to say—policies aimed at picking the winners in advance have only rarely succeeded. The best general rule, then, is for the public sector to provide a policy framework that allows the law of comparative advantage to work.

Most non-economists do not appreciate the critical role that the real exchange rate plays in determining a country's comparative advantage. So I will try here to paint that picture simply, in one easy lesson. Today, in Nicaragua's currency markets, the nominal exchange rate is around 18 cordobas per dollar. Certain activities end up as export operations, while others are on the import side of the picture. But if the exchange rate today were only 9 cordobas per dollar, one can be sure, with other prices and costs at or near their current levels, that very few if any operations would pass the export test. On the other side, the demand for imports would be enormous, with just about everything foreign looking very cheap (at 9 cordobas per dollar). At that rate, then, the Nicaraguan economy would face an enormous potential deficit in its international trade.

Now imagine what would happen if, with other things much the same as now, the exchange rate stood at 36 cordobas per dollar. That would make all imports look enormously expensive, and would render many products very profitable to export. The trade balance would generate a huge surplus under such circumstances.

So we have a huge trade surplus with the dollar at 36 cordobas, and a huge trade deficit with the dollar at 9 cordobas. Where between these two, will the market set the exchange rate? The answer depends on the other sources of foreign exchange. Nicaragua has quite a lot of financing coming in, from emigrant remittances, from foreign investment, and from foreign aid. The more dollars that come in under these rubrics, the greater the trade deficit that will end up being "financed". This is true with or without CAFTA. What CAFTA does is modify the composition of the exports that will survive the comparative advantage test, particularly by fostering the developing of new and expanded markets in the U.S.

In executing Nicaragua's response to CAFTA, I see no strong general role for government apart from setting up a sound general policy framework that will help Nicaragua's private sector find the activities that will correspond to its future comparative advantage under CAFTA. The main exception to this general rule is agricultural research and extension. Individual farmers, planters, and **ganaderos** do not have the scale of operations that would justify their own research on new products, or experimentation with new varieties. Moreover, the nuances of climatic variation across regions make it unlikely that research outcomes from abroad will be susceptible to ready adoption here. These facts provide the rationale for a public sector program of agricultural research and extension aimed at finding new varieties and methods of cultivation and of adapting to Nicaragua's own soil and climate conditions, certain promising results from research done in other parts of the world.

Nicaragua's climate and geographical location offer considerable promise of finding U.S. "niche markets" for new agricultural exports. The recent experience with okra exports is a case in point, and can serve both as a model for and a challenge to a future program of agricultural research and extension.

## A WORD ON EMIGRANT REMITTANCES

There is no question in my own mind that Nicaragua has been and will continue to be faced with an abundance of dollars. Typically such abundance makes the dollar cheap in real terms, and pushes up local costs to the point where many traditional exports are subjected to a serious cost squeeze, and where new export developments are threatened on the cost side.

A look at Nicaragua's balance of payments data confirms such a potential threat. Table 6 shows a summary of key items for 2006.

One quickly captures from Table 6 the key facts—a deficit (\$1,304 million) of over 25% of GDP in Nicaragua's balance of trade in goods and services. But this deficit is more than fully financed (\$1,419 million) by emigrant remittances, other transfers and direct investments. The problem, if any, is not one of financing, at least for 2006. If there exists a problem it would be one of “Dutch disease”—a dollar that ends up being very cheap in real terms, as a consequence of its great abundance in the local marketplace.

When I see such a large discrepancy between imports and exports being so fully financed by sources that appear to be reasonably steady (non-transitory) over time, my immediate reaction is to expect a severe case of “Dutch disease”. To my surprise, I did not find it in the case of Nicaragua.

**TABLE 6: NICARAGUA'S BALANCE OF PAYMENTS, 2006 (SUMMARY); MILLIONS OF U.S. DOLLARS**

<b>Balance of Payments</b>	
Imports of Goods	-3,422
Imports of Services	-342
<b>TOTAL</b>	<b>-3,764</b>
Exports of Goods	1,977
Export of Services	483
<b>TOTAL</b>	<b>2,460</b>
Balance on Goods & Services	<b>-1,304</b>
<b>Financed By</b>	
Emigrant Remittances	655
Other Current Transfers	200
Capital Transfers to Public Sector	282
Direct Investment	282
<b>Total of Above Items</b>	<b>+1,419</b>
Difference	+115
Increase of International Reserves	49
Other Items (Net)	66
GDP in U.S. dollars (2006)	<b>5,300</b>

Table 7 reproduces Table III-12 from the Central Bank's *Anuario de Estadísticas Económicas, 2001-2006*. It is easy to see there that the average private sector wage shows no trend at all, and the components reveal a declining real wage for the lower skill levels offset (to produce a flat average wage) by a modest rise for the technical, professional and executive levels. Conversations with

economists and business people confirmed that they did not consider wage costs to be a significant impediment or deterrent to new investment initiatives.

Needless to say, finding a situation of a huge dollar inflow **without** a corresponding case of Dutch disease led me to wonder how such an anomalous result could have been generated. As of now I can only offer a plausible explanation. It is well known that in addition to flowing in significant numbers to the United States, Nicaraguan workers have also moved quite massively to Costa Rica and El Salvador. Let me state quite emphatically that I do not consider migration to the U.S. to perform any sort of labor-market-equilibrating function, but it makes sense to me that migration to Costa Rica and El Salvador might indeed do so. In these cases I draw an analogy to the rural-to-urban migration that occurs in most countries as an integral element of their economic development. There are two models of such migration, each of which has its own way of producing a labor-market equilibrium. In one case we have urban wages playing the equilibrating role. They are always higher than the corresponding rural wages, but not so high that they produce an unabated flood of migrants to the city. Instead they tend to reflect a situation in which there is a steady trickle of migrants, moving in response to increments in the demand for urban labor. In the second case the destination wage is higher, and the equilibrating force tends to be the likelihood of unemployment at the destination point. In this variant, the wage at the destination stays, for one reason or another, at a level that is super-attractive to migrants. In response they tend to flood in, but not for long, because their unemployment experience gets worse and worse. So if the destination wage does not fall to bring about an “equilibrium flow” of migrants, the probability of unemployment will take over that role. This is sometimes called a Harris-Todaro effect, after two of the pioneers of the idea of a labor-market equilibrium in which the equilibrating variable was migration-fed unemployment.

**TABLE 7: INDEX OF REAL WAGES AND SALARIES IN NICARAGUA, 2001–2006**

Year	Overall Average	Manual Labor	Services	Administration	Technical & Professional	Executives
2001	88.9	67.9	79.1	100.4	103.8	104.9
2002	91.8	69.6	77.6	98.9	111.9	108.4
2003	91.4	67.8	76.5	97.2	111.9	111.1
2004	88.3	63.3	73.4	92.9	110.1	109.0
2005	89.3	62.0	72.8	91.0	115.4	110.7
2006	89.2	62.2	72.4	88.9	118.6	107.3

Source: Banco Central de Nicaragua, *Anuario de Estadísticas Económicas, 2001–2006*, Table III-12, p. 44.

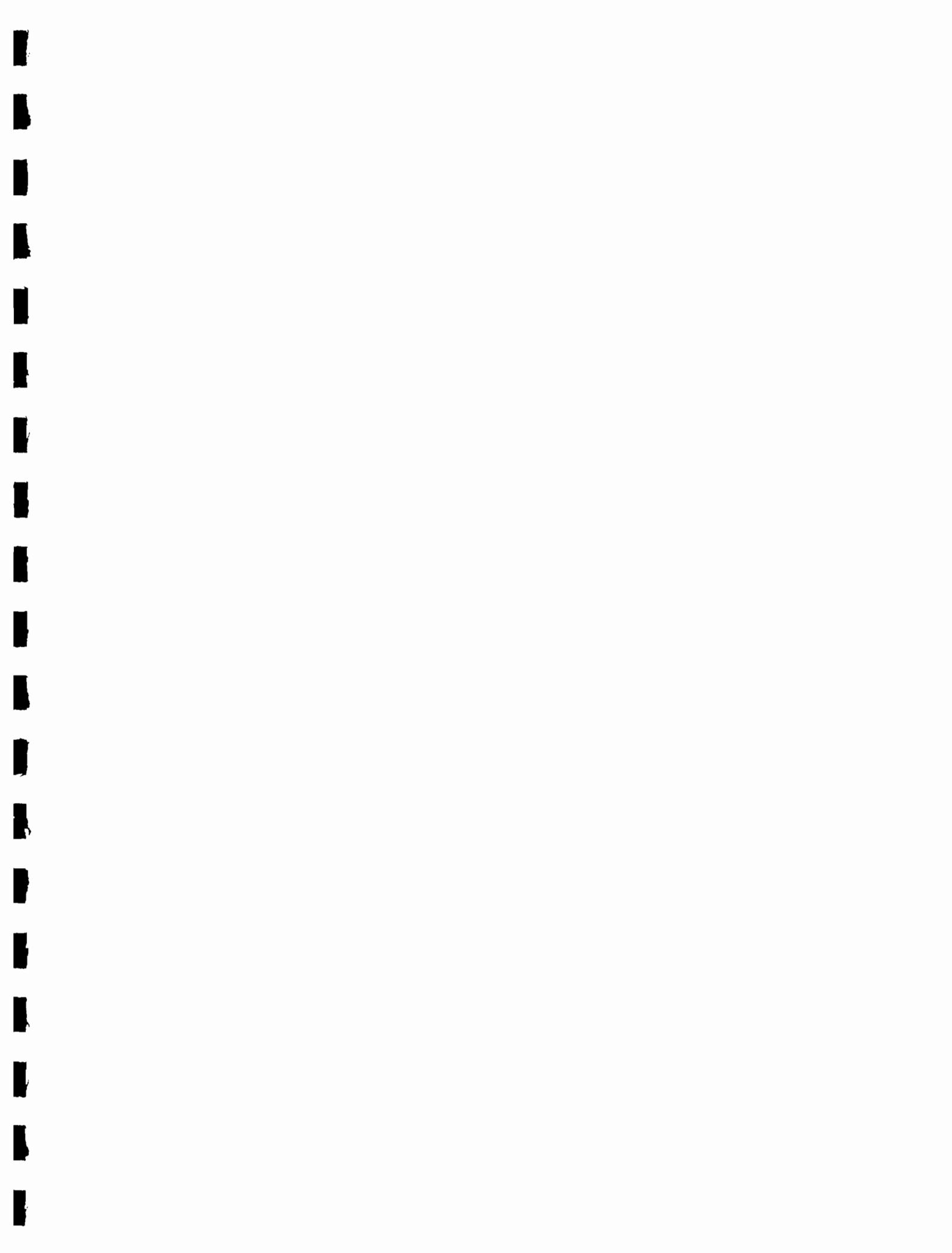
My hypothesis is that in Nicaragua’s case the first rather than the second mechanism is probably at work, and that the relationship between wages in Nicaragua and those in Costa Rica and El Salvador is such that migration to these destinations responds to the demand for labor there, **and** to the demand for labor in Nicaragua itself. Thus, when labor demand in Nicaragua is buoyant, rather than seeing real wages rise significantly, we see less outmigration to El Salvador and Costa Rica. Similarly, when labor demand at home slackens, we see more outmigration, and possibly more local unemployment, rather than a big fall in real wages. These ideas are offered here as a plausible explanation for what we see in Nicaragua; they should be thought of as presenting a reasonable hypothesis, not as proven scientific propositions.

What lesson can we draw from the relative constancy of real wages during the recent past? The good side of that coin is that it puts Nicaragua in a good position to take advantage of the challenges and

opportunities offered by the world market in general and by CAFTA in particular. Issues of a soaring cost of labor, precipitated by a sharply appreciating real exchange rate, do not seem likely to stand the way of a healthy economic stimulus from CAFTA.

What can stand in its way, however, is the element of uncertainty as to future economic developments and future economic policy. I believe that a solid commitment to economic rationalization and reform on the part of the Nicaraguan government would have the effect of opening up a whole new spate of investment opportunities, as business people would respond by lowering their perceptions of risk. This would mean they would be willing to accept a lower cutoff point for the expected real rate of return on investments, and consequently invest in a whole swath of new investments that they under currently prevailing conditions would have left untouched. It is in this way that a decisive effort to rationalize Nicaragua's economic policies and to otherwise allay the fears and trepidations of potential investors, offers a substantial hope of a new surge of economic performance. In short, CAFTA plus a well-designed package of policy reforms, plus a continuing demonstration of the government's determination to build and maintain a modern, efficient framework of economic policies—these elements can combine to bring a new prosperity to the Nicaraguan economy.













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# REFLECTIONS ON CORRUPTION: AN ECONOMIST'S PERSPECTIVE

TRANSCRIPTION OF AN ORAL PRESENTATION AT A USAID  
ROUNDTABLE—"LESSONS LEARNED IN DESIGNING ANTI-CORRUPTION  
INTERVENTIONS IN ECONOMIC GROWTH"

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Transcription of an Oral Presentation at a USAID Roundtable—"Lessons Learned in Designing Anti-Corruption Interventions in Economic Growth", Washington, DC. 12 June 2006. Arnold C. Harberger, University of California, Los Angeles.

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# REFLECTIONS ON CORRUPTION: AN ECONOMIST'S PERSPECTIVE

Let me state at the outset that I do not make these remarks as a long-time student of or expert on the phenomenon of corruption. Rather, I want to bring to the table, as it were, the types of considerations that economists tend to pursue, on those occasions when they face problems of a similar nature. In what follows, I will focus most of my attention on the area of tax evasion, where the label of "corruption" fits most comfortably. Later, I will make reference to black market activity, where the fit may be a bit looser.

The economic aspect of corruption was previewed in a sense, in Daniel Kaufmann's keynote presentation. He referred there to the "supply side" and the "demand side" of corruption. The existence of these two, traditional economic aspects is quite clear in any case where direct bribery is involved. They are therefore clearly present when bribes are paid to customs or internal revenue agents. But tax evasion also often takes other forms, in which the corrupt parties are the taxpayers themselves, as they conceal or misstate their tax liability. This type of evasion takes place just about everywhere, and I would classify it as "demand side only" corruption. The supply side would enter in, in such cases, only if at some point the responsible officials end up conniving with the taxpayers in order to conceal their guilt.

Where to begin? I believe the best starting point is to recognize that tax evasion and avoidance are what I would call "social science phenomena". They represent behavior whose extent and intensity can be estimated with some degree of confidence. Moreover it is behavior which clearly responds to economic stimuli. The higher is the applicable marginal tax rate, the greater will be the incentive for the taxpayers to evade; the more rigorous and serious is official inspection and enforcement, the smaller will be the degree of evasion.

In their behavior responses to changes in tax rates, taxpayers resort to both legal and illegal courses of action. When their evasive maneuvers are within the law, we classify them as tax avoidance; when they are outside the law, we call them tax evasion. In terms of behavior, both serve as avenues of response when tax rates get raised.

Economic concepts are well suited to the analysis of both evasion and avoidance. The "benefit" to taxpayers is, of course, the money they save as a consequence of these actions. But what about the costs? In the case of tax avoidance, the cost may be straight-out financial, for example, in a rate of return that is much lower on tax-exempt bonds than on taxable bonds. Or that cost may take the form of greater expenditure of time and effort, as is the case when taxpayers invest in forestry operations, which not only entail significant risks, but also require significant amounts of hands-on management (the benefit being the treatment of forestry gains at a favored long-term capital gains rate).

With respect to evasion, the cost can take even more forms. The places where a taxpayer can conceal income may have lower rates of return; they may involve more time and effort on the part of

taxpayers, and (depending on the taxpayer) they may entail a sense of shame or guilt that by itself acts as a deterrent. But, of course, there is also the potentially very powerful deterrent provided by the probability of the evasion being detected and the severity of the penalties that are likely to ensue when this is the case.

Now back to the social science aspect. Of one thing we can be quite sure: the higher is the relevant marginal tax rate, the greater will be not only the incentive to evade and avoid taxes, but also the actual amount of such activity (for given levels of penalties and enforcement, and for given sets of alternative strategies by taxpayers).

Most younger people in the United States do not realize that not too many years ago (during and immediately after World War II) our top federal income tax rate was 91%, and that it remained as high as 70% all the way up to the Revenue Act of 1986. Needless to say, such rates gave very strong incentives to evade and to avoid taxes—much stronger than we see today, with a top marginal rate of 35%. Yet, even today, the incentives are not negligible. The Internal Revenue Service estimates that overall, the U.S. tax gap in 2001 was between 15.0 and 16.6 percent of taxes due. Yet the gap was estimated to be less than 1.5 percent for wage and salary income, which accounts for more than half of the tax base. It follows that the gap from non-wage-and-salary income is over 30% of the amount due, probably reaching as high as 50% in some categories.

All this is occurring in the United States, renowned for its levels of tax enforcement and compliance. Small wonder, then, that tax evasion is a problem of prime importance in the fiscal affairs of most developing countries.

I received my own shock treatment concerning the extent of evasion in developing countries, in the course of a study that I was asked to do as part of a major project on fiscal policy in Argentina, done under the tripartite auspices of the Organization of American States, the Inter-American Development Bank and the United Nations Economic Commission for Latin America and the Caribbean. In my part of that work, I took as my baseline the actual income tax declarations of Argentine taxpayers in 1954. I then made the assumption that the percentage of total income accruing to each bracket in the income distribution remained the same between 1954 and 1955. (This assumption is reasonably safe, as, barring severe crises, national disasters or similar emergencies, relative income distributions tend to change only very slowly through time.)

On the above basis, it was possible to compare actual 1959 tax declarations with the amounts that would have been declared, had compliance levels remained the same as they had been in 1955. The result of this experiment was that tax collections in 1959 were only about two thirds of what we estimated them to have been, if compliance levels had remained constant. This experiment was then repeated for a subsequent leap forward in time, and it resulted in a further decline of about a third in tax receipts, compared with what we estimated would be collected on the basis of 1959 compliance levels. The end result was that over a span of about a decade, Argentine tax compliance appeared to have been cut by more than half!!!

All this could have happened just by itself, with no help from the authorities. But it is rendered more plausible when placed in context. In point of fact, there appears to have been a sort of tug-of-war between Argentina's taxpaying public and that country's tax administrators. This more plausible scenario runs as follows. The authorities perceive a shortfall in revenue (partly, at least, as a

consequence of evasion). To recover the “lost” revenues they raise tax rates, which in turn induces yet more evasion, etc., etc.

This is an example of tax evasion and avoidance as endogenous variables, responding to changes in tax rates (and of course, to other forces such as the intensity of enforcement). In some countries, this endogeneity is so openly recognized that one is almost tempted to label the income tax as a voluntary tax. More than once, I have heard Central American entrepreneurs state openly that “of course we are willing to pay more taxes, but only when the government shows itself capable of spending the extra money wisely.” That, of course, is no blueprint for bringing about greater compliance; if wealthy taxpayers are given the combined role of prosecutor, jury and judge of how well the government spends its money, one can safely predict that they will always have the ingenuity to find reasons not to pay more.<sup>1</sup>

## THE CULTURE OF EVASION, AVOIDANCE AND OTHER FORMS OF CORRUPTION

This brings me back to my original theme of looking at corruption as a “social science phenomenon”. Dealing with corruption is one thing when it is relatively rare and isolated. It is quite another thing when virtually everybody engages in it.

Different experiences come to mind here. First, I recall a time in the 1970s when my family and I landed in Rio de Janeiro just prior to the opening of a course I was giving at the Getulio Vargas Foundation. We were going to be in Brazil for a couple of months, so we had sent a couple of large suitcases as airfreight (to avoid excess baggage charges). Arriving at the airport to pick them up, we were told that we would have to wait until they cleared customs. And how long will that take?, we asked. Imagine our consternation as we heard the answer—“O, maybe 3 or 4 months, maybe 6 months”!! Our dismay did not last too long, however. Needless to say, my frustration was very much on my mind as I arrived at the Foundation for my first class, so it was the very first topic I brought up at a lunch with the other professors. I was surprised at the calm with which they listened to my tale of woe. “No problem,” they said, “all you have to do is hire a **despachante** (an expeditor) to get your stuff out of customs.” Expeditors represented a perfectly legal and respectable profession, advertising their services in newspapers, in the yellow pages, etc. So I dutifully hired one who was recommended to me and for a price of \$100 or so (far lower than the excess baggage charges I would have had to pay), our bags were delivered to the door of our Ipanema apartment the following day.

It is notable that in this story, neither my colleagues nor the **despachante** himself even mentioned the possibility that bribes to the customs officials might be involved. He was simply helping to solve a problem that we faced, in much the same way as old fashioned mayors and aldermen in Boston, New York, Chicago and other big cities typically found ways of “helping out” when their constituents found themselves in difficult situations. (I would add that in these U.S. cases money was rarely involved, what the politicians were “buying” was the political loyalty and future votes of their constituents.)

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<sup>1</sup> One American former student of mine served as a consultant to the tax authorities of several Central American countries. In one of them he had access to the individual tax declarations of the nation’s top income-tax payers. Imagine his surprise to find his own name among the top dozen income-tax declarers in the country!!!

What had happened here was that “society” had found a way to adapt to what might otherwise to a terribly constraining “disturbance”. It was not in the interest of the customs inspectors to hold up everybody’s shipment for month after month. That would almost surely lead to a great political hue and cry, and most likely to a crackdown by the authorities. But neither was it in the interest of the customs inspectors to have to deal with each and every recipient of each and every shipment that arrived. Not only would this involve a lot of time and trouble, but it too could easily lead to a big enough protest (to the political authorities) to in the end result in a crackdown on the customs inspectors themselves. How convenient, then, was the appearance on the scene, as if by magic, of this profession of **despachantes**!! They could serve as intermediaries, keeping their clients at a kind of informal price schedule would have to emerge, so that most of the time the despachantes could give their clients a reasonable estimate of what their services would cost (or, as it was, in our case, an exact price.)

I have no doubt that the government received some complaints from irate importers, but nothing like the volume of complaints they would have got if the **despachantes**’ fees were outrageously high or totally capricious. So the system went on, providing an “equilibrium” solution that was reasonably acceptable to most of the parties concerned. Readers should note that in this equilibrium, the government did indeed receive revenue from its customs operations. Some of the \$100 that I paid almost certainly went to the government; some went to the customs official, and some obviously went to pay for the services of the **despachante**.<sup>2</sup>

It is hard to predict in what cases such an equilibrium solution, involving some degree of corruption and some degree of market mechanism, will in fact emerge. But we can certainly describe situations in which elements favorable to such an outcome are present. The case of starting up new businesses comes immediately to mind as one in which the services of expeditors might be quite helpful, and in which therefore their emergence has some degree of likelihood.<sup>3</sup>

## THE SPECIAL CASE OF BLACK MARKETS

In circumstances in which official controls attempt to keep prices below their equilibrium level (where supply equals demand), “black” or “gray” markets emerge with such frequency that many economists outright “predict” their presence. (Note that the mere fact that prices are held below the level that equates supply and demand by itself guarantees that some of that demand would be unsatisfied if all transactions took place at the control price.<sup>4</sup>

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<sup>2</sup> This suggests the likely flexibility and adaptability of the system. If a new minister presses forcefully for more rigorous customs administration, the **despachantes**’ fees will go up, and the government’s share may increase in response to the minister’s pressure. Later, perhaps, the pressure may subside, with the old “equilibrium” be restored. But if the pressure keeps up, the likely result is a new equilibrium, representing higher **despachantes** fees with a higher share being actually paid to the government.

<sup>3</sup> An interesting experiment would be to canvass newly established enterprises within the so-called formal sector of a developing country, trying to explore the process by which they reached that status. Did they go through all the specific steps that were formally required, or were shortcuts available, enabling them to reach the same goal more “efficiently?”

<sup>4</sup> The only exception to this rule occurs when the authorities buy the affected commodity in the world market, reselling it (at a loss) at the control prices so as to satisfy all demanders. This is what the Chilean Popular Unity government (1970–973) did, importing wheat and reselling it so as to satisfy the market demand for bread at its (very low) control price. The budgetary loss stemming from the implicit subsidy on imported wheat reportedly cost the government hundreds of millions of dollar. Even this might have been regarded as a bargain by the authorities, for the loss would have been much greater had the government also paid the world price to the domestic suppliers of wheat.

When a black or gray market is fully functioning, it establishes a market clearing price. If all supplies and all demands are transacted at this price, it is as if the (lower) control price simply did not exist. This is not the typical case however. Normally some demanders will be lucky (or specially favored) enough to be able to actually buy the item at the control price, so only a fraction of the supply is available to the black market. In such a case the black market price will be above what would have been the market-clearing price.<sup>5</sup>

In spite of its complications, a typical black or gray market mimics a free market situation in the sense that the going price tends to be widely known among regular suppliers and demanders, and of course, in the sense that this price in fact tends to equilibrate supply and demand in the black market segment of the total market.

Sometimes, indeed, market participants may consider themselves to be substantially unaffected by the existence of a black market premium. Such was the case, for example, in India in 1961–62. India at that time was literally plastered with controls of all kinds—on imports, exports, investments, interest rates, etc. Under the circumstances, many people, but especially businessmen, had a good motive to keep a significant part of their wealth in places where they could use it freely, independent of the Indian government's controls and restrictions. Thus during my stay in India in this period, I was prone to take advantage of any chance meeting with an Indian businessman, to probe into what he considered to be the cost involved in using the black market (for foreign exchange) to convert his rupees into British pounds in order to invest them in the London financial market. Thus I would ask, what sort of rate of return they expected in their London investments. Somewhat to my initial surprise, nearly all of them answered that they would get the same rates of return as native Londoners were getting. "And what about the black-market premium?" I asked. To which they answered "It really doesn't matter—we pay, say, 20 percent more for our pounds on the outbound operation, but we typically get 20 percent more when we convert the proceeds back to rupees using the same black market. The only risk is that the black market premium may change between the outbound and the inbound operations, but even then it can equally well change in our favor, as against us."

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<sup>5</sup>The limiting case occurs when suppliers are functioning "on" their original (normal) supply curves and are thus producing (at  $P_B$ , the black market prices, which is above  $P_N$ , the normal price, a quantity  $Q_T$  which is greater than the normal quantity  $Q_N$ . This total quantity produced goes to two groups of consumers—the lucky ones, who make their purchases at the control price  $P_C$ , and presumably buy more than what they would purchase at the normal price  $P_N$ , and the unlucky ones, who have to pay  $P_B$  and therefore demand less than they would have done at  $P_N$ . It is evident that the market-clearing black market price  $P_B$  must be greater than the normal market price  $P_N$ , because if it were equal to  $P_N$ , total supply would be the normal quantity  $Q_N$ , and the unlucky demanders would demand their normal amount also. But the lucky demanders (buying at the lower price  $P_C$ ), will demand more than their normal amount, leading to total demand > total supply at  $P_N$ . This excess supply is relieved by  $P_B > P_N$ , because as  $P_B$  rises, the unlucky demanders end up demanding less than at  $P_N$ , while suppliers end up producing more than at  $P_N$ .

The above case is rare, however, for we can expect that suppliers will recognize that some degree of risk is involved when they sell at a price greater than the control price. For this risk they will need some compensation, which will be reflected in a modified supply curve, with supply prices exceeding, for each quantity, those that would prevail in a straight, uncomplicated market setting. This set of reactions modifies the above result for the limiting case. In a more "typical" black market situation, the total quantity transacted will very likely be less than the corresponding normal equilibrium quantity, and the black market price will even more surely be higher than the normal equilibrium price that would prevail in the absence of controls.

## LITTLE SENSE OF TRANSGRESSION

One thing that is characteristic of most black markets is that their participants seem to have little or no sense that they are really doing something wrong. They are more likely to fume at the government for creating a situation where they have to pay a black market price than they are to feel guilty about doing so. With rare exceptions, this absence of a sense of guilt is a characteristic of black market situations.

Nowhere has this been more evident than in Chile. First, and as an important piece of background information, let me inform readers that Chile as a nation is world-famous for its lack of corruption. When people develop indicators of corruption, Chile ranks with Singapore, the United States and the Scandinavian countries rather than with the rest of Latin America. Chile's police (the **carabineros**) are absolutely renowned for their honesty. Indeed, in over 50 years of visiting Chile, I have heard not a single one of my hundreds of Chilean friends and acquaintances speak of paying a bribe, or even of hearing about somebody else paying a bribe, to a Chilean **carabinero**. Another Chilean anecdote. Recently a Chilean Central Bank President discovered that his own secretary was clandestinely selling secret financial information to an outside group. He immediately fired, and instituted judicial proceedings against the culprit. **Nonetheless**, and in spite of the president himself being the one who discovered the crime, he was in the end asked to resign, because he had been the central bank president under whose responsibility the crime had occurred. That seems to many to represent an excess of zeal on the part of the Chilean government.

But I am here recounting this incident, along with the fame of the **carabineros**, in order simply to underline Chile's general and well-deserved reputation as a place where acts of corruption are rare events. This reputation is not of recent vintage. It was there in the 1950s and the 1960s, pretty much as it is today. But now turn the clock back to 1970–73, when the popular unity coalition led by Salvador **Allende** ruled Chile. That was a government that seemed to specialize in economic policy mistakes. There were literally thousands of items subject to price controls. At one point there were a dozen official exchange rates for the U.S. dollar, ranging from a low of 25 escudos to a high of something like 1325 **escudas** per dollar. And above all this there was a black market in foreign exchange at about twice the highest official exchange rate. So distorted was the pricing situation that one could pay for a night's lodging in a suite at Santiago's best hotel (the Sheraton San Cristobal) with the proceeds of two dollars sold in the black market. With the proceeds of a single dollar one could buy some 500 **maraquetas** (small loaves of bread about the size of a Kaiser roll), or some 1200 tokens to use for a pay telephone call.

I describe the situation in some detail so as to help convince readers of how wild, how crazy Chile's economic situation was at that time. Official prices were huge bargains, but one had to be lucky to be able to buy anything at official prices. The mere availability of an item at official prices led to queues that stretched for blocks—people joined these queues instinctively, not even knowing what was the item being sold at the head of the line, simply because they knew it would be a great bargain. How much of a bargain can be gauged by the fact that the black market prices of most items were quoted as **multiples** of the official price—e.g., chicken at 5 times the official price, beef at 7 times, butter at 8 times, etc.

Probably there were a few households in Chile whose access to the official markets and prices was sufficiently good that they could avoid the black market altogether. But the great majority of

households ended up participating in black market activity on a regular basis, simply to meet the family's most basic needs.

Now, finally, to the punch line—at that time, in Chile, Latin America's champion of probity, nearly everybody participated regularly in black market activity, **without evidencing the slightest sense of guilt**. Somehow, black market activity was in a **different category** from trying to bribe a policeman or engaging in other corrupt acts.

To give U.S. readers some sense of how many black market participants feel, in many other parts of the world, I like to use the analogy with U.S. attitudes toward “speeding” on a contemporary U.S. limited-access highway. On most such roads, the posted speed limit is 65 miles per hour, but most of the day one sees the entire flow of traffic going at 68, 70, 75 and even higher speeds, with no sense of guilt, no sense that they are doing something wrong.

The purpose of all of this is to help readers to sense some of the problems in modifying people's behavior in such cases. If the police randomly stopped an occasional car for going 68 mph, when everybody else was going at the same speed, and the unlucky recipient of the ticket has to pay a huge penalty, most people would regard that as capricious, unjust and in the final analysis unacceptable behavior on the part of the police. Gentler approaches are what is called for—a widespread publicity campaign, highly visible police patrols, going on the highways at or below the posted speed limit, automatically leading the great majority of drivers to slow down, etc., etc. If prosecutions and heavy penalties are involved, much better if they start out by catching the occasional truly reckless driver going, say, 85 or 90, and only gradually tightening the net by citing drivers going at 80, then somewhat later at 75, etc.

I think most U.S. drivers would see merit in such a gentler, perhaps more gradual approach to speed limit enforcement. I believe also that this is a good recipe for dealing with tax evasion in those cases where it starts out being rampant, with the perpetrators having no sense of guilt.

## HOW TO DEAL WITH WIDESPREAD TAX EVASION

The speed limit example just presented suggests the appropriate strategy for dealing with widespread tax evasion (such as prevails in a great many developing countries).

The idea is to start, not with a random attack on ordinary, average citizens, but with a campaign focused on “outliers”. For example, the authorities might first arrest the owners of a nightclub that simultaneously serves as a center for illegal gambling and perhaps for prostitution. The publicity surrounding their arrest and prosecution, and, presumably their sentencing to prison terms will send a message to taxpayers generally. Compliance will automatically improve. Perhaps at the next step the prosecution would turn to some more “legitimate” business people, but ones whose understatements of income were very large in absolute terms. The longer-term strategy involves moving the “active margin” at which prosecutions and serious penalties take place, by gradual but very firm and deliberate steps, from the “outlier” point at which it started, closer and closer toward the region where most taxpayers are located. Experience suggests that this strategy can bring about excellent results. A further useful step could be the periodic publication of lists of those taxpayers who have declared incomes higher than a certain level.

An example is the case of Mexico during 1988–94 (the Salinas presidency). Francisco Gil Diaz (who later became finance minister under President Fox) was then collector of internal revenue. He

instituted a compliance campaign following the above-described strategy, and ended up sending something less than a hundred violators to jail. But the jump in compliance was notable—such that real tax revenues went up, in spite of substantial reductions in the tax rate.

## **DEALING WITH CORRUPTION AT THE CUSTOMS HOUSE**

Perhaps because customs duties are one of the oldest and most traditional sources of finance for national governments, their administration has a very long and rich history of corruption.

As an economist, I want to open this topic with what I feel is the most important lesson—the wisdom of the uniform tariff rate as the cornerstone policy. With a uniform tariff rate, there are only two ways in which a customs official can engage in corruption—by simply letting an item pass without paying anything, or by understating its true value. By contrast, with highly differentiated tariff rates, a customs official can simply note that “this item might be classified in category 3521, carrying a tariff of 150%, or in category 2260, with one of 110%, or in category 1556, with a rate of 70%, etc.” Corruption then becomes very hard to detect, particularly when the different categories all carry some degree of plausibility with respect to the item in question (a condition that is not very hard to meet with traditional tariff schedules typically covering 5000 or more categories).

While a uniform tariff rate solves some problems, it leaves open the vexing issue of getting an accurate value on each imported item. The incentives to falsify can be substantial, but are not so great when the tariff rate is itself low (e.g., in the 0% to 10% range, or even that between 10% and 20%). Special note should be taken of the cases of systems of severe import restrictions via licensing or other schemes, or of rigorous exchange controls. In such cases importers have incentives to overstate the value of the goods they are importing, simply to get a bigger foreign currency allocation. (The excess value to later be sold on the black market or simply freely used, without the need for official authorization, by the importing entity in question.)

One way in which an increasing number of countries have attempted to improve their customs valuation is through contracts of preshipment inspection. International firms specializing in such inspections are contracted to do the inspection in the foreign port—before shipment to the country in question. This gives a pretty ironclad insurance against undervaluation due to the corrupt practices of the country’s own customs officials. But that guarantee holds only to the degree that the preshipment valuation is allowed to stand. In some actual cases the preshipment valuations are either advisory (rather than definitive), or subject to appeal and later revision in the receiving country. In these cases, of course, corruption by the local inspectors can again come into play.

I should add that the scheme of preshipment inspection was sanctified by a World Trade Organization agreement (in 1993), that a considerable number of countries, many in Africa and several in Latin America have adopted the system, and that a considerable number of international firms now offer preshipment inspection services.

## **THE FINAL GOAL: HOW SUCCESSFUL COUNTRIES DEFEAT CORRUPTION**

The economics of tax evasion can easily lead one to fatalistically accept the idea that, like death and taxes themselves, this form of corruption will always be with us. To an extent that is bound to be true, but certainly **not** for the typical taxpayer.

The pessimistic vision stems from the economic notion that economic agents gravitate towards an equilibrium in which, at the margin for each type of action, the incremental benefits associated with the last spurt of effort will tend to be equal to its incremental costs. Since escaping some dollop of tax (via a little extra evasion effort) will always entail the financial benefit of not paying it, the economics of the story seems to boil down to each taxpayer just finding the right degree of evasion effort—being ready to engage in such efforts up to, and just up to, the point where the next bit of effort would carry a cost greater than the benefit. At this point it almost seems as if economics predicts that just about everybody would be a tax evader, even if only for a small amount.

Countries like the U.S. and the UK seem to suggest that this dire “prediction” need not be reflected in reality. And the reason turns out to be quite simple and straightforward. It relies on what we economists call a “corner solution”. The analogy is with those foods we do not eat at all. This may be because even our first serving of caviar is too expensive to warrant its very high cost. Or it may be that our dislike for anchovies causes us not to eat them, even when they appear as items on free breakfast or luncheon buffet. In the caviar case, there is a positive benefit to the first serving, but the cost is too high. In the anchovy case, even the first serving fails to have a benefit—and indeed has a cost in terms of what we call “disutility”, so that we would have to be actually paid to do so before we would take even our first bite of anchovies.

All this can quite simply be linked to tax evasion. The caviar case is the one where taxpayers really would engage in evasion if they clearly knew that they wouldn’t be caught. This determines that they perceive the results as beneficial. But they fail to engage in the evasion activity because its likely cost, as they perceive it, exceeds the benefit by a clear and probably substantial margin.

The anchovy case has its parallel in those taxpayers whose internal ethical scale already imposes a sufficient burden of opprobrium on any act of “cheating the government”, that they would not do so even if they were sure of not being penalized by the authorities.

This gives us a good way of looking at the problem. For any level of penalty, and any level of the probability that it will be imposed—there will be first those taxpayers who wouldn’t cheat even if there were no penalty at all (call these group A—the anchovy people). Then there are those who probably would engage in acts of evasion if the penalty were smaller, or if the probability of detection and penalty were lower, but who for the given penalty and probability levels find it prudent to comply fully with their tax obligations (call this group C—the caviar people). But finally there are quite likely to be those who sense a benefit from at least some degree of evasion, which is greater than the perceived cost (for given penalty level and probability of detection). Call these group E, the evaders.

What, then, is the recommended strategy? It is to set the penalty levels and/or the probability of detection sufficiently high so that nearly everybody who might otherwise be in class E chooses, logically and rationally, to be in class C (those in class A will presumably be there, independent of the actions of the authorities). This is the approach followed by the United States Internal Revenue Service, the UK’s Inland Revenue and similar authorities in other high-compliance countries. It is an approach that works well, at least by comparison with the systems of most developing countries. But, as I have been at pains to explain, it is not an approach that lends itself to being implemented overnight. It is critical that typical taxpayers be left with a high degree of confidence that the system will treat them fairly, and in a nondiscriminatory fashion, and that the penalties are not outrageous, when viewed in relation to the delinquencies that call them into play. One reaches this sort of tax

administrator's nirvana, I am afraid, only at the end of a long and arduous road. But for any country, in my opinion, it is a road well worth traveling.



**U.S. Agency for International Development**

1300 Pennsylvania Avenue, NW

Washington, DC 20523

Telephone: 202-712-4810

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