ECONOMIC GROWTH IN LATIN AMERICA: SOURCES AND PROSPECTS*

José De Gregorio
Universidad de Chile

Jong-Wha Lee
Harvard University and Korea University

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Abstract

This paper examines the growth experience of Latin America and discusses future prospects. For this purpose we use alternative approaches. We first perform growth decompositions to look at the behavior of total factor productivity and examine differences across regions of the world and within Latin America. Then, we use cross-country growth regressions to compare the relative performance of Latin American countries vis-à-vis the rest of the world. This approach allows us to go beyond the traditional, and perhaps misleading, straightjacket of attributing growth to productivity or investment. It highlights the role of human resources, and institutional and policy factors. With this framework we show high inflation and inward looking development strategy are the main reason for the low growth of Latin America. But, as reforms have advanced within the region, growth prospects have improved.

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1. Introduction

The issue of economic growth, its determinants, policies that affect it, and prospects, has tremendous implications. The evolution of the well being of the population and prospects for poverty reduction are intimately related to economic growth. Even the issue of potential growth is at the heart of recent discussions on stabilization policy. Whether a Central Bank should attempt to cool down the economy or not will depend crucially on what is the view of the rate of growth that can be sustained without facing inflationary pressures. The recent evolution of the US economy has also led economists to take seriously this issue in the discussion on monetary policy.

The growth performances during the last three decades are very diverse among the countries in the world. The four East Asian tigers- Hong Kong SAR, Korea, Singapore, and Taiwan- grew extremely rapidly at an average of over 6.0 percent per year in per capita terms between 1965 and 1995. On the other hand, many countries in the Sub-Saharan Africa and the Latin America regions recorded less than 1.0 percent average per capita income growth during the same period. The high growth of East Asian countries, compared to the poor performance of African and Latin American economies leads directly to the question of what can be done to spur growth.

In this paper we revisit Latin American growth. Two are the main purposes of this paper. First, to examine past evolution of growth in a comparative perspective and the search for explanation for its poor performance. Second, to discuss potential growth for the region, presenting methodological alternatives to address this question. For these purposes we use alternative approaches. On the one hand we examine the issue of total factor productivity (TFP) growth, based on the Solow growth model, to examine performance in Latin America. And on the other hand, we use cross-country growth regressions to examine what can explain poor performance of Latin America relative to other regions.

We show that the rate of TFP growth was the main factor explaining changes in growth rates over time within Latin American countries as well as the lower growth of Latin America relative to other regions. Changes in capital accumulation also played a relevant role. Using cross-country growth regressions, and focusing in particular on the differences with East Asian economies, we find that economic policy and institutional factors, such as macroeconomic stability and the degree of openness explain the bulk of the differences. Although the level and quality of human resources are important determinants of growth, they do not explain low growth in Latin America. External factors, such as terms of trade, and convergence effects, did not play a quantitatively important role in explaining low growth in the region. Indeed, the evolution of terms of trade in Latin America did not contribute to the lower growth of Latin America relative to that of East Asia. We also find that the difference in initial income did not explain an important part of growth differentials.

As reforms proceeds in Latin America, we expect that the average growth rate of per-capita GDP for the following decade increases to 2.5% from an average rate of 0.5% in the period 1985-95. However, countries that have proceeded faster with policy and

institutional reforms or that are starting with lower level of income, have better growth prospects.

The paper follows in five sections. In section 2 we present an overview of Latin American growth and discuss the existing empirical evidence. Then, in section 3, we present estimates of total factor productivity growth for the region and compare it with past performance in other parts of the world. In section 4 we use an alternative approach. Using empirical work based on extended version of neoclassical growth model we present estimations of cross-country growth regressions. In section 5 we use those results to explain which has been the factors behind Latin America's low growth performance and also discuss prospects for the future. Finally, section 6 concludes.

2. Overview

Latin America has grown slowly in the last 40 years. Table 1 presents the details of growth in the sample of 21 Latin America countries we analyze in this paper compared to the average of other regions. All averages are constructed unweighted by size, thus giving the same weight to all countries.[1]

Clearly, the average growth rates in Latin America had been below world average until 1990. Only in the five-year period from 1990 to 1995 the average growth rate was higher than the world average as well as OECD countries. As it will be clear in section 5, Latin America has made improvements lately that suggest its potential growth has risen.

Latin America's bad performance is not the exclusive consequence of the debt crisis and the so called "lost decade" of the eighties, but its performance has remained consistently poor. Over the period, its average growth rate was only slightly above that of Africa, but well below those of Asia and industrial countries. However, the 1980s were the years where the difference between Latin America and the world growth rates was the largest, and in some sense, one can support the view that growth performance was particularly poor after the debt crisis. Compared to Sub-Saharan Africa, the other region where the growth performance was also poor, our sample of Latin America countries has had, on average, about three times as much income as that of Sub-Saharan Africa.

It is interesting to note that in average GDP per capita in Latin America was 82% higher than the average of Asian countries in 1960, but the low growth over the next 35 years reverted this situation, placing Asian average per capita GDP more than twice that of Latin America. This is a crude proof of the income differences that can accumulate from having low growth vis-à-vis high growth during a period of thirty-five years. Comparatively, during the 1990s the region has performed much better than the world as a whole. In the nineties, many Latin American countries, in particular Guyana, Chile, Peru, El Salvador, and Argentina, have been at the forefront of economic reforms. In

[1] See section 4 for details on data. We use basically data from Summers and Heston (1991) v. 5.6, complemented with World Bank data. The selection of countries was done on the basis of data availability.

general, the table also shows that growth has moved in the same direction in all countries in the region.

Some observers argue that Latin American growth was not that poor prior to the debt crisis, and indeed the region performed well. As shown in the table, this is a misperception. It might reflect the problem of taking weighted averages, rather than unweighted ones, since among the best performers were the two largest countries of the region, Brazil and Mexico, which accounted for 30% and 25% of regional GDP on average during this period, respectively. Thus, at the peak of Brazil's economic miracle, during the seventies, regional growth of Latin America varies from an unweighted average of 2.3% to a weighted average of 4.0% per annum. During this period Mexico was also growing stronger than the average of the region. In order to assess cross-country growth performance an unweighted average reveals what happened to the "average nation," and hence is more appropriate. However, as table 1 shows, although growth performance during the 1960s was below the world average, the difference during the eighties was much more impressive, and in a way, the eighties were years of particularly poor economic growth.

What has been behind this slow growth? Of course there are many things that could explain low growth performance of Latin America, and we will revisit some of them in the later section of this paper. There are some previous studies that discuss some of the empirical evidence concerning Latin American growth. De Gregorio (1992), using a five-year panel data for 12 Latin American countries between 1950 and 1985, finds that the two most important factors inhibiting growth within Latin American countries are low investment and high inflation. The former is also clear from growth decomposition as shown later. However, as argued later on, once more factors are taken into account the role of investment becomes less important. The reason is that many factors identified as being important determinants of growth may affect it through capital accumulation. Therefore, the preeminence of investment may reflect the importance of other missing factors rather than a direct effect. This also questions the usefulness of traditional growth accounting.

Regarding inflation, Latin America is by far the region with the highest inflation rate in the last 30 to 40 years, and this has hindered growth. Inflation affects growth through many channels,[2] As argued by Fischer (1993), the high rate of inflation is also a summary statistic for macroeconomic mismanagement and for the inability of governments that can not put in place sound economic policy. In a similar panel-data framework, Corbo and Rojas (1993) find that inflation and black market premium are both significant determinant of growth when entered separately in the regressions. But, when jointly included, the two variables are not significant. More recent evidence, however, has shown that in a large sample of countries inflation and black market premium are both negatively correlated with GDP growth.

[2] See De Gregorio (1996) for further discussion on channels through which inflation affects growth, and how they are consistent with existing evidence.

Although in De Gregorio (1992) there are other variables that affect growth, they are not quantitatively significant in explaining growth in Latin America. This is the case, for example, of foreign direct investment (+), government expenditure (-), political instability (-), and enrollment ratios (+). In addition, it does not found an important effect for terms of trade on growth. However, with a different measure, the rate of terms of trade growth is strongly positively correlated with GDP growth. This evidence has also been confirmed in some analyses using a larger sample of countries (Barro, 1997), and confirmed here in section 5.

Roubini and Sala-i-Martin (1992) also find that inflation has been one of the factors hindering growth in Latin America. In addition, they argue that financial repression is also responsible for low growth in Latin America. However, De Gregorio and Guidotti (1995) find the opposite. In a regression for a large cross-section of countries they actually find that indicators of financial development are positively correlated with economic growth, suggesting that actually financial development fosters growth. But, when the analysis is concentrated in Latin American countries, it is found that indicators of financial development are actually negatively correlated with economic growth. They argue that this reflects the negative effect of financial liberalization that took place with a very poor regulatory framework. Countries that liberalized faster, and therefore where credit from the banking system to the private sector grew faster, were countries where growth was lower. This happened during the debt crisis. The rationalization for this phenomenon is that in the presence of poor regulation, moral hazard, given by the perception (ex-post the right one) that the government would bailout the private sector in the event of a crisis, would lead to poor credit allocation and excessive risk taking. This has become a very popular explanation to understand the characteristics of the recent currency-banking crises in Asia.

Several of the issues above are taken up in sections 3 and 4, but to start our analysis we take a preliminary look at the data using the neoclassical growth model (or Solow growth model), which is used for empirical analysis in the next sections. For this, we start from the following production function:

(1) $Y_t = A_t F(K_t, L_t)$,

where Y is GDP, A is a technological parameter, or total factor productivity, K is the stock of capital, and L is employment. The function F has constant returns to scale. For simplicity we assume that technology is a Cobb-Douglas:

(2) $Y_t = A_t L_t^{a} K_t^{1-a}$.

Now, we assume that labor growth at a rate n and total factor productivity growth is x. That is:

(3) $L_t = L_0 e^{nt}$,

(4) $A_t = A_0 e^{xt}$.

We normalize initial labor and level of technology to one. Then, the production function can be rewritten as:

$$(5) \qquad Y_t = A_0 L_0^{a} (e^{(n+x/a)t})^{a} K_t^{1-a}.$$

In order to work with variables that are constant in the long run we define:

$$\tilde{z} = \frac{Z}{e^{(n+x/a)t}},$$

that is a '~' indicates a variable measured in terms of efficiency units. If x were zero, the variables would correspond to per capita ones, but we also incorporate the fact that labor becomes more efficient over time. The production function (1) becomes:

$$(6) \qquad \tilde{y}_t = f(\tilde{k}_t) = \tilde{k}_t^{1-a}.$$

In this framework growth is the result of the exogenous improvement of labor inputs and its efficiency, and the accumulation of physical capital. By the balance of goods in the closed economy[3] without government (or government put together with the private sector) we have that total output equals consumption plus investment (written in terms of efficiency units):

$$(7) \qquad \tilde{y}_t = \tilde{c} + \tilde{i}_t.$$

To close the Solow model we just need to add a behavioral assumption. In this framework it is simply the assumption that people saves (consumes) a fraction s (1-s) of income. In addition, investment equals the increase in capital minus the depreciation (at a rate *) of existing capital. Written in terms of efficiency units one has also to add the depreciation in terms of population (at a rate n) and in terms of increasing efficiency of labor (x/"). That is:

$$\tilde{c}_t = (1-s)\tilde{k}_t^{1-a},$$

and

$$\dot{\tilde{k}}_t = \tilde{i} - \left(n + \delta + \frac{x}{a}\right)\tilde{k}.$$

Therefore, the equation that describes the evolution of capital is:

[3] The closed economy assumption is extreme from an intertemporal point of view, since economies can lend and borrow internationally. But, appealing to the Feldstein-Horioka evidence on the long-term close relationship between investment and savings, and the fact that not all capital accumulation can be internationally financed, in particular human capital, a closed-economy framework can be used.

(8) $$g_{\tilde{k}} \equiv \frac{\dot{\tilde{k}}_t}{\tilde{k}_t} = s\tilde{k}^{-\alpha} - \left(n + \delta + \frac{x}{\alpha}\right)$$

where g_z is the rate of growth of any variable z.[4] In steady state output, consumption and capital, per-efficiency unit is constant. Given the Cobb-Douglas assumption output and capital are given by:

$$\tilde{k}_t^* = \left(\frac{s}{n + \delta + x/\alpha}\right)^{1/\alpha},$$

and $$\tilde{y}_t^* = \left(\frac{s}{n + \delta + x/\alpha}\right)^{1-\alpha/\alpha}.$$

This economy does not grow (per efficiency units) in the long run. In other words, in steady state equation (8) becomes zero. Using small letter for per-capita variables and capital letters for total variables we can easily verify that in the long run:

$$g_k = g_y = g_c = \frac{x}{\alpha},$$

and $$g_K = g_Y = g_C = n + \frac{x}{\alpha}.$$

In the transition the economy grows according to equation (8). Replacing the steady state values and using the previous expressions for per capita growth we have that, during the transition period:

(9) $$g_k = \frac{x}{\alpha} + s(\tilde{k}^{-\alpha} - \tilde{k}^{*-\alpha}),$$

and considering that $y=Ak^{1-"}$, we have that:

(10) $$g_y = \frac{x}{\alpha} + (1-\alpha)s\left(\frac{y}{k} - \frac{y^*}{k^*}\right).$$

From the above expressions we can draw a number of conclusions that can help us to have a first look at the data:

- There is no growth in the steady state. Growth rates decline as the economy approaches to the steady state. Provided Latin American economies are low and middle-income, they should grow faster now than in the long run since they are in the transition to the steady state.

[4] Note that to go from the growth of the variable per efficiency units to the growth of the total level of the variable, we just need to add $n+x/"$ to the growth rates of the variable per-efficiency units.

- Conditional convergence: provided economies converge to the same steady state, richer economies should grow slower. If we do not observe convergence, then economies could be converging to different steady states. According to equation (10) the farther away is the economy from the long-run capital-output ratio, the faster they should grow.
- The savings rate does not affect long-run growth, but for a given level of initial income economies with higher savings rate grow faster in the transition. The reason is that they converge to a steady state with higher rate level of income.
- In the transition, GDP per capita growth is negatively correlated with population growth, since the higher the rate of population growth the lower the equilibrium level of income.
- In the long-run only TFP growth is what drives growth. Faster growth is only the results of faster productivity growth.

These are the issues we provide a cursory look in the remaining of this section. The discussion on productivity growth is addressed in the next section. For now our focus is on convergence and the effects of savings (investment) rates and population growth.

The data are depicted in figures 1 to 3. Regarding convergence, figure 1 shows that there is no relationship between GDP per capita in 1965 and its rate of growth in the next 30 years. Excluding Guyana, Haiti and Nicaragua, there is some negative relationship. Indeed among the largest countries of the region there is some convergence. However, it is driven mainly by the low growth of Argentina, Uruguay and Venezuela, the richest countries in 1965. For the rest 15 countries, high and low growers, there is no clear relationship with initial GDP per capita.[5] Therefore, the evidence cannot support the presence of unconditional convergence.

There is a clear relationship between growth and investment rates (figure 2), which is consistent with the implication that higher savings-investment leads to higher growth. However, there is the possibility of reverse causality, as discussed later. In contrast, there is no clear relationship between GDP per capita growth and the rate of population growth (figure 3), and, if anything, the relationship is slightly positive.

Given the lack, or limited, convergence in the levels of income in Latin America, it is difficult to think that it is an homogenous region, in a transition to a common steady state, as can be argued, for example, for OECD countries (see Jones, 1998). Therefore, we would need to explain the difference in growth performance within the region. For this, we expect productivity growth and other determinants of economic growth differ within the region. It is also interesting to explain differences between Latin America and the rest of the world and find out what has made this region to display poor growth performance. Relatively low growth has been the case in most Latin American countries. Only 2 countries, out of 21, grew faster than the average of the world for the period 1960-95, and none faster than the average of OECD countries. We observe no convergence to OECD income levels. Of course, no country in Latin America has grown even close to the

[5] This is shown econometrically with panel data for a sample of 12 countries in De Gregorio (1992).

average of East-Asian countries. Differences within the region and between regions are the issues we explore further in the next sections.

3. Total Factor Productivity Growth

In this section we review some previous studies on TFP growth, and compare the performance of Latin America with respect to other regions. Then, we compute growth decomposition to understand difference within Latin American countries, and finally we pay a closer look to the evolution of TFP in two countries at the forefront of reforms, Chile, which started almost 20 years ago, and Argentina, whose deep transformations started in the nineties.

3.1 Latin America in comparative perspective

In order to have a consistent comparison of TFP growth across countries, table 2 presents the estimations performed by Senhadji (1999), using a capital share of 0.4, for different regions of the world covering the period from 1960 to 1994. This table confirms what we already discussed in the previous section. Latin America had modest performance throughout the whole period.[6]

As expected, except in industrial countries, the contribution of labor to growth is relatively similar across countries. Only during the 1960s Latin America had faster productivity growth that the rest of the groups, but for the entire period TFP growth was only higher than that in Africa. Compared to the best performers of East Asia it is clear that the main difference stems from differences in the contribution of capital. This is the consequence of the very high savings rate in Asia (Young, 1995), and to a less extent productivity growth, which is relatively high in the period from 1987 to 1994. From 1960 to 1986 TFP growth in East Asia was relatively modest.

It is interesting again to go back to the Solow growth model to try to explain these differences. Table 2 shows that differences in productivity growth by itself cannot explain differences in growth rates across countries, and hence differences should stem from the distance between each country's output and its steady state.

Finally, in table 3 we present evidence on TFP growth for selected countries and periods from other studies. In general, when more than one measure is available we use the more intermediate values. Data constructed by Elias (1990),[7] in the most comprehensive review of Latin America's TFP performance for a group of seven countries, show that in period of 50 years from 1940 to 1990 only two countries- Chile and Mexico- had TFP

[6] Data are not comparable to those of the section 2, the definitions of the variables as well as the countries included in the sample are not the same. But, it is useful to see whether the conclusions are dependent of the particular data set used, or the countries included in each sample.

[7] These data are updated from those of Elias (1990) and presented in Barro (1998).

growth above 1% a year.[8] By contrast, the figures show that all Asian countries except Philippines had over 1% TFP growth. As reported in the previous section, the differences in terms of growth rates are much higher. Therefore, as in the spirit of Young (1995), one can conclude that what really has created difference across countries is capital accumulation. Hence, the determinants of capital accumulation should be the ones that determine growth performance.

Table 3 also shows the period of glory for TFP. This was the postwar period within industrialized economies. Most of the countries had TFP growth above 3%, except, among others, the richest countries, United Kingdom and United States. This period lasted until 1973, and as the following panel testifies, there was a significant decline thereafter, the so-called productivity slowdown. But in a longer span of time and country coverage, from 1960, OECD countries still display a high rate of TFP growth.

3.2 Growth Decomposition within Latin American Countries

We construct our own estimates of productivity growth for the period 1960-90 for the sample of 21 Latin American countries, which allows us to study growth differences within Latin American countries. We use a value of 0.6 for the share of labor. Due to the lack of consistent long-time series for employment, we use labor force, which should not produce large differences when looking at average across decades. Of course, this approximation is very poor at business cycle frequencies since capacity utilization and unemployment distort the measures of TFP. Table 4 shows the results.[9] Growth performance, as reported before, has varied widely over time and across Latin American countries. The contribution of capital has been on average larger than that of TFP. Only in the sixties TFP growth was similar to the contribution of capital. In the seventies, TFP growth declined sharply, while the contribution of capital was relatively stable. Finally, during the 80's TFP growth looks to be negative. This is, of course, not a case of technological reversal, but mainly a measurement problem since we implicitly assume that labor and capital are being fully utilized, while unemployment and capacity utilization declined sharply during the debt crisis.

It is useful to note that our results are consistent with those of Elias (1990) reported in table 2 and Senhadji (1999) for Latin America. There have been important changes across decades. During the sixties there were countries, such as Brazil, Mexico, and Venezuela with TFP growth above 3%, and several others above 2%. It is interesting to note that growth during the sixties was strong, but as said before, it was moderate according to international standards and still below the average of the world.

In the time dimension as well as in the country dimension, we observe more stability in the contribution of labor as well as the contribution of capital. In contrast, most

[8] This should be mainly due to good performance in the 40's and 50's, since the evidence we present here shows much less TFP growth after 1960.

[9] In order to avoid the dependence of the calculations on extreme observations, and adding the shortcomings on lack of data to control for the utilization of factors, which can exacerbate fluctuations in TFP, all data in Table 4 are computed as the average of the yearly rates of growth.

fluctuations of output growth come form changes in TFP growth. From the sixties to the eighties TFP growth dropped from 1.9% to -2.0%. This change of 3.9 percentage points contributed to most of the 4.5 percentage points decline in GDP growth. In contrast, capital accumulation only explains a decline from 2.0% to 1.2%. Very similar conclusion can be reached when comparing the decline from the seventies to the eighties. This also happens at the country level. For example, in Bolivia or Peru, countries with declines in growth rates of 6.0 and 5.9 percentage points between the sixties and eighties, the reductions in TFP growth rates were 4.2 and 5.4 percentage points, respectively.

TFP growth is also more variable across countries than the "sources of growth." Of course, part of this is the result of measurement problems, specifically the lack of control for unemployment and capacity utilization. However, the evidence is not too different from those of other studies discussed above, allowing us to conclude that most fluctuations in long run economic growth are explained mainly by changes in the performance of TFP. The contribution of the growth of factors of production, capital and labor, has been more stable.

3.3 A Closer Look at Two Reformers: Argentina and Chile

Looking at large samples of countries may have a problem because the reliability of many specific country data becomes dubious. In addition, there are difficulties to find consistent data, such as those of the Penn World Tables, for the 1990s. For this reason here we look more closely at two successful experiences in Latin America, those of Argentina and Chile.

Chile was the first reformer in Latin America and its growth performance has been also exceptional. Argentina began with reforms in the early nineties, but also has very high growth after that. Contrary to Chile, growth came immediately after the reforms, and in the form of the well-known boom of exchange rate-based stabilization plans, while in Chile took much longer, due to partly to the debt crisis in the early eighties that retarded the growth take-off.

Here we use official national accounts and employment data and modify slightly the methodology. This will help us to have a robustness check and to see how TFP evolves after reforms.

The first modification is in the assumption about the share of capital (1-"). Instead of assuming a constant figure, we use the method proposed by Sarel (1997). The method is based on the idea that economies are composed of a number of sectors, each sector has the same factor shares around the world, and what makes the difference in factors shares across countries is the difference in the composition of output. Then, Sarel (1997) estimates worldwide sectoral production functions, deriving the share for each sector. This approach has the advantage that can explain the fact that despite shares being relatively constant over time they vary across countries when measured directly looking at factor payments in national accounts, and it seems that developing countries tend to have a higher share for capital. There are alternative explanations for the relatively small

share of labor in developing countries (De Gregorio, 1992), such as market power or the misclassification of informal labor.[10] In both cases one would expect that as the country develops, the extent of monopoly power or informal labor would tend to decline and hence, to increase the share of labor. However, using the explanation based on output composition, the reason for the decline in the share of labor would be the change of composition of output from capital-intensive sectors to labor-intensive sectors as the economy grows.

Using disaggregated data for Argentina and Chile, the shares of capital are 0.3 and 0.4, respectively. In addition, neither of the two countries has experienced important changes in participation over time. For Argentina it fluctuates between 0.30 and 0.31 and for Chile between 0.41 and 0.44. We also construct data on capital stock using data on investment and the method of perpetual inventory, as proposed by Nehru and Dareshawar (1993), and assuming a 5% rate of depreciation. Table 5 presents basic data and results for computations of TFP. The estimations were also done by reversing the values for the share of capital, that is for Argentina we used a share of capital of 0.4 and for Chile a value of 0.3. In addition, we also assumed 3% rate of depreciation. Both of those changes did not affect the figures presented in table 5.

In Chile TFP starts growing in 1986, while in Argentina started in the early 1990s (see figure 4). These were the periods of high growth. TFP growth rates were unusually high. Compared to the experiences revised before, TFP growth, in particular in Argentina was surprisingly high. We also observe that during periods of TFP decline, the fall was also sharp. This is unlikely to be what actually happened to technology, and is the bias that occurs in recessions, which are periods when capacity utilization declines. Since we do not adjust for capacity utilization, TFP would actually appear to be declining instead of capturing the fact that the use of capital is what falls.

Table 4 shows also growth decompositions for Argentina and Chile for the nineties. Argentina's growth was lower than that of Chile, but the contribution of TFP growth is higher. Given similar contribution of employment growth, the other side of the high TFP growth in Argentina is the low contribution of capital, which results from low investment rates and a relatively higher capital-output ratio. The results for TFP growth are, of course, very high compared with those of other countries presented before. It is difficult, based on comparative experiences to think that both countries can reproduce those high growth rates based only of TFP, which at most could be about 2 to 2.5%. TFP growth around 4% per year is very unusual. In the long run this implies rates of per capita growth between 3 and 4% (with a labor share of 0.6), which with 1.5% growth of employment would imply long run growth between 4.5% and 5.5%. Of course, higher savings rate could help to increase the rate of growth.

The high rate of TFP growth, particularly those of Argentina may be the initial effects of stabilization and reform. Presuming the economies were producing inefficiently and far from its potential, TFP would increase very quickly in the initial stage, but clearly cannot

[10] This has been also argued by Collins and Bosworth (1996), but Senhadji (1999) has found opposite results, that is, higher share of labor in developing countries.

be sustained in the long run. However, whether Argentina and Chile are in an exceptional level of TFP or just recovering from low levels of TFP can be analyzed by looking at figure 4. Argentina in 1997 just had reached the level of 1980. Therefore, there is still scope for increasing productivity as long as has just reached the levels it had before the debt crisis and the subsequent deterioration of economic conditions during the whole decade of the 1990s. In contrast, Chile's rapid growth of the 1990s has led productivity to be 27% higher than what it was in 1980. Therefore it is more likely to expect a path as those discussed by Edwards (1998), who argues that after the implementation of the reforms there is a period of rapid productivity growth followed by a slowdown.

4. Sources of Economic Growth: A Cross-country Analysis

In this section, we explore the main factors that influenced the growth rates of per capita income for the last three decades. The analysis is based on a general framework of cross-country regressions, which puts the experience of individual country in a global context. This approach allows us to understand the specific factors associated with economic growth across countries and the key differences between fast and slow growing economies. Based on this framework, we explore the factors that explain why Latin American countries grew much slower than the best performing economies in East Asia. This exercise will provide a basis for understanding the future growth prospects of the Latin American countries.

4.1 The Basic Empirical Framework

The basic empirical framework is based on an extended version of the neoclassical growth model, as described by Barro (1991, 1997), Barro and Lee (1994), Sachs and Warner (1995), Radelet, Sachs and Lee (1997). This model predicts conditional convergence of income, as described in section 2, implying that a country with a lower initial income relative to its own long-run (or steady-state) potential level of income grows faster than a higher-income country over time (see equation (10)). The basic idea is that the farther an economy locates away from its steady-state level, the greater is the gap of reproducible (physical and human) capital stock and technical efficiency from their long-run potential levels. The gap of existing capital and technology from their steady-state levels provides the economy with the chance for rapid catching up, through the higher marginal productivity of capital accumulation and the diffusion of technology from the more technically advanced economies. In the cross-country context, convergence implies that poorer countries would grow faster than richer countries, when controlling for the variables influencing the steady-state level of per capita income. As a reduced form the model can be represented by

$$(11) \qquad g_{yiT} = \log(y_{Ti} / y_{0i}) / T = \beta_0 + \beta_2 \log(y_{0i}) + \beta_3 Z_i + \varepsilon$$

where the dependent variable is the growth rate of per capita income for the period T for country i, $\log(y_{0i})$ is a log value of the initial level of per capita income for country i, and Z_i denotes an array of the variables that influence the country i's steady-state level of per

capita income. The conditional convergence implies a negative coefficient on the initial income. Note that according to equation (10), the variables included in Z could affect either the rate of productivity growth (x) and the long-run level of income (k^*), and hence we cannot separate both effects.

Our regression applies to a panel set of cross-country data over three decades, 1965-75, 1975-85, and 1985-95.[11] Some previous studies used a cross-section data in which each country has only one observation. The approach based on the panel data set seems to consider more information that is available from time series variations within country. We estimate this system of the three equations by a seemingly-unrelated-regression (SUR) technique, which allows for the correlation of the errors across the equations.[12] One problem occurs in the cross-country regression when Z_i - the control variables- are endogenously determined. To avoid this simultaneous problem, we also use an instrumental-variable technique, where some of the instruments are earlier values of the regressor.[13]

A wide variety of external environment and policy variables will affect growth rates by changing the long-run potential income and the rate of productivity growth. Based on the results from previous empirical research, we consider the following variables as the important determinants of long-run per capita income: (1) human resources (initial human capital stock, and initial life expectancy, (2) investment rate, (3) exogenous shock (terms of trade growth), and (4) institutions and policy variables (government consumption, rule of law, inflation, democracy, and openness).

Human Resources

The various models of new growth theories emphasize human capital as a key factor to drive the long-term growth of income. In the framework of extended neoclassical growth model, for given values of the other explanatory variables, a higher human capital stock leads to a higher steady-state per capita income. In the endogenous growth model, human capital generates perpetual growth by either preventing returns to a broad capital from falling or by increasing capabilities for the innovation and adaptation of new technologies. The human resource variables include a measure of human capital stock. We use the average years of secondary and higher schooling for males aged 25 and over, available from Barro and Lee (1996). The greater initial educational stock indicates that more skilled workforce can produce more output from a given natural and physical resources. Hence, the country with a greater education stock is located in a more favorable condition for future growth. In addition, life expectancy at birth, as a log value at the initial year of the period, is used to measure health attainment, which is considered

[11] We do not include the 1960-65 period in the regression because the values of explanatory variables during the 1960-65 period are used for instruments.
[12] Some studies suggest to estimate panel growth regressions by the fixed-effects estimation technique, considering for an unobservable country fixed effect. However, the fixed-effects technique eliminates information from cross-section variations. See Barro (1997, pp.36-39) for details.
[13] Temple (1999) discusses statistical problems concerning the estimation and interpretation of growth regressions.

as another important component of human capital stock. A higher life expectancy would tend to indicate a healthier, more productive worker.

Investment

In the neoclassical growth models, a higher value of saving rate raises the steady-state level of output per capita (equation (11)) and thereby increases the growth rate for a given starting value of GDP. One concern in the empirical specification is that any effect from contemporaneous investment on growth may reflect reverse causation- high growth causing high saving- because investment rate is measured by the average ratio of investment to GDP over the period in which growth is also measured. This problem, however, can be solved by adopting the instrumental-variables estimation technique that uses lagged values of investment rate as instruments for the contemporaneous investment.

Terms of Trade Shock

The terms of trade shock is considered as an exogenous factor that affects the growth rate of an individual economy. An improvement in the terms of trade makes a country produce more output and expand its export sector.

Institutions and Policy Variables

We consider five institutions and policy variables. The first variable we consider is *government consumption* (defined as the average ratio of government consumption to GDP). The measure of government consumption used here exclude public expenditures for education and defense because these two categories of government consumption expenditures can be regarded as primarily investment. Higher government consumption rate is considered, by taking out resources from productive activities and causing distortions to private decisions, to lead to a lower growth rate.

The second institution and policy variable is a measure of *overall maintenance of the rule of law* in the economy. Institution environment that secures property rights and provides a strong legal system is central for investment and other aspects of economic activities. The best available indicators to measure quality of institutions come from international consulting firms that give advice to international investors based on information collected by local experts. Knack and Keefer (1996) introduce measures of institutional quality that was initially constructed by Political Risk Services. The measures consist of five indicators including (a) quality of bureaucracy, (b) corruption in government, (c) rule of law, (d) expropriation risk, and (e) risk of repudiation of contracts by government. Among the various indicators, the measure of the rule of law is considered to have the most explanatory power for economic growth (Barro, 1997). We use this measure of the law enforcement, which was rescaled to zero-to-one scale, with one the most effective.

The third policy measure is *inflation rate.* De Gregorio (1992, 1996), Fischer (1993), and more recently Barro (1997, 1999) find that inflation has a significant negative effect on growth. Hence, the worsening price stability, caused by macroeconomic mismanagement,

seems to lead to lower steady-state level of per capita output for given values of other explanatory variables. Because of the possible reverse causation from lower growth to high inflation, we use prior colonial status as instruments in the instrumental-variable technique. The inflation variable is included as a logarithm value, considering the non-linearity in the effect of inflation on growth (De Gregorio, 1992). Thus, we smooth the influence from some extreme cases of the countries that experienced hyperinflation.

We also include a measure of "*democracy*" as another institution variable. This measure is constructed by Barro (1997) based on the measure originally constructed by Gastil. It measures the strength of electoral rights and civil liberties, scaled from zero to one, where one corresponds to the highest level of democracy. The relationship between democracy and economic growth is not clear. For example, more democratic political regime can entail redistribution of income from rich to poor. This redistribution may reduce the incentives of people to work and invest, and thus work against economic growth. But, an improved income distribution can reduce the tendency for social unrest and thus contribute positively to overall economic activity.

The last policy variable is a measure of *openness*. Open economies have greater access to cheap imported intermediate goods, larger markets, and advanced technologies. An economy's openness to international markets can be represented by various measures including tariff rate and black market premium of exchange rates, or indicators of trade policy regimes. We use the openness measurement constructed by Sachs and Warner (1995). This index is calculated as the fraction of years during the period that the country was considered to be open to trade and thus sufficiently integrated with the global economy. The evaluation of the country's openness is made on the basis of four dimensions of trade policy: average tariff rates, quotas and licensing, export taxes, and black market exchange rate premium.[14] [15]

4.2 Regression Results

[14] Sachs and Warner (1995) judge a country to be open if it satisfies minimum criteria on all four aspects of trade policy: (1) average tariff rate must be lower than 40 percent on average; (2) quotas and licensing must cover less than 40 percent of total imports; (3) the black market premium must be less than 20 percent; and (4) export taxes should be moderate. See Sachs and Warner (1995) for details.

[15] Rodriguez and Rodrik (1999) claim that the indicators of openness frequently used in the literature are poor measures of trade policy and they are highly correlated with other sources of economic growth such as macroeconomic policies. For example, they argue that most of the correlation between Sachs-Warner openness measure and growth can be explained by only by two criteria: the state monopoly on exports and the black market exchange rate premium. They point out that because all the countries classified as ones with the state monopoly on exports come from Africa, this export monopoly variable may reflect other unexplained factors that lowered growth rate in Africa. Black market exchange rate premium is also claimed to reflect poor macroeconomic policy rather than trade restriction. Although these criticisms have some valid points, we consider that the positive effect of trade openness on growth through various channels such as imports of capital and intermediate goods and technology spill-over have been proved by many historical and industry case studies as well as the cross-country studies. The Sachs-Warner openness measure enters quite significantly in the cross-country regressions regardless of the specification and the black market premium is considered to reflect the degree of foreign currency rationing in the economy.

Table 6 presents the regression results using the basic framework of equation (11) and the explanatory variables just described. The dependent variables are the annual growth rates of real GDP per capita over three periods: 1965-75, 1975-85, and 1985-1995.[16] The regressions apply to a data set for about 83 countries. The column 1 of Table 6 shows the result of the basic regression by the SUR technique. The result shows strong evidence for conditional convergence: the coefficient on the log value of initial GDP is highly significant, and the estimated coefficient is -0.021 (standard error = 0.003). Thus, a poor country with a lower initial income level grows faster, with the variables influencing the steady-state level of income controlled. Specifically, the coefficient implies that a country at the half of income level of another country grows by 1.45 percentage points (=2.1%*ln(2)) faster than the richer country.

The human resource variables turn out to have a strong effect on economic growth. The educational attainment variable, which is measured by an average year of secondary and tertiary schooling, has a positive and significant effect on the growth rate: the estimated coefficient on the schooling variable is 0.005 (s.e. = 0.002). The mean and standard deviation of the schooling variable were 1.8 and 1.3 year, respectively in the 1985-95 period. Therefore, the coefficient indicates that one standard-deviation increase in the secondary and schooling raises the growth rate of per capita income by about 0.7 percentage points per year. The logarithm of life expectancy at birth- a measure of health attainment- is highly significant in the regression: the estimated coefficient 0.047 (s.e. = 0.012) implies that one-standard-deviation increase in life expectancy at birth at 1985 is estimated to raise the growth rate by 0.8 percent per year.

The investment rate also has a significantly positive effect on growth rate. The coefficient 0.065 (s.d. = 0.020) implies that a one standard deviation increase of 8 percentage point in the ratio of investment to GDP, is associated with an increase in the growth rate of about 0.5 percentage points per year.

The regression result provides the significant relationship between change in the terms of trade and per capita GDP growth. The estimated coefficient on the growth rate of the terms of trade is 0.136 (s.d.= 0.029), indicating that countries with favorable terms of trade shock by one-standard-deviation of 0.035 in the 1985-95 period grew by 0.5 percentage points per year than other countries.

We find clear evidence that the institution and policy variables play a significant role in determining economic growth. The government consumption variable has a significantly negative impact on growth: a 10 percentage point increase in government consumption ratio decreases the growth rate of per capita income by 1.1 percentage points per year.

The rule of law index has a strong positive effect on growth, indicating that countries with more effective law enforcement for the protection of property and contractual rights tended to have higher growth rates, 1965-90. The estimated coefficient, 0.017 (s.e. =

[16] The real GDP figures are obtained from Summers and Heston (1991) v.5.6. For the years during the period from 1990 to 1995 in which the Summers-Heston figures are not available for many countries, the World Bank real GDP data are used to construct the growth rates.

0.006) implies that an one-standard-deviation increase of 0.27 in this index (on a scale of 1.0) in the 1985-95 period is associated with an increase in the growth rate of 0.5 percentage points.

Inflation (as a log value) has a significantly negative effect on the growth rate. The estimated coefficient, -0.006 (s.e. = 0.001), implies that an increase in the average rate of inflation by one-standard-deviation of 1.17 would lower the growth rate by 0.6 % per year.

The regression result confirms the non-linear relationship between democracy and growth, as found by Barro (1997). The coefficients on the indicator of democracy and its square terms are positive and negative respectively and both of them are statistically significant. The pattern of coefficient values indicates that growth rate increases with political freedom in low level of democracy but decreases with it once the society has attained a certain level of political freedom.

The openness variable appears to be very strongly and positively associated with growth rate. The estimated coefficient 0.009 (s.e. = 0.003) indicates that an economy open to trade during the entire period (openness =1 in a scale of 1.0) grew 0.9 percentage points faster per year than an economy which was completely closed throughout the period.

Table 6 also shows the result of regression with the inclusion of regional dummies. Column 2 of Table 6 shows that Asia (East and Southeast Asia), and Latin America dummies have statistically insignificant coefficients, while Sub-Saharan African dummy enters significantly negative. It is interesting to note that initial cross-country studies found a significant and negative "Latin American dummy" (Barro, 1991), which in the current empirical framework becomes insignificant, and indicates that the variables included at the RHS explain most of the poor performance of Latin American economies. However, the point estimates, although small in magnitude, still indicates that besides the variables included, Latin America has lower growth than average, and East Asia has more growth than average.

The significance of the Sub-Saharan African dummy implies that the growth rate of Sub-Saharan African countries was on average lower by 1.2 % than that of the countries in the other regions by some unexplained factors. Recent studies attribute the lower growth of the African region to ethnic diversity (Easterly and Levine, 1997) and geographical factors (Sachs and Warner, 1997). The inclusion of these variables can explain the African dummy, which become insignificant. Even with the three regional dummies controlled, the regression shows that most of the explanatory variables are still significant and have the estimated coefficients of the same magnitude, compared to those in column 1 of Table 6.

Column 3 and 4 treat the simultaneity concerns by employing an instrumental-variable estimation technique. Although the estimation results are broadly similar to those from the SUR estimation, substantial differences arise for inflation and investment rate variables. The estimated effect of inflation on growth becomes much larger when we

adopt the instrumental-variable estimation technique. On the contrary, the investment variable becomes insignificant in the column 3 where lagged values of the investment rate are used as instruments for the contemporaneous investment rates. The finding that investment has the low explanatory power for growth is consistent with that of Blomström, Lipsey, and Zejan (1996) and Barro (1997). It implies that the positive association between growth and investment in column 1 and 2 reflects reverse causation from growth to investment, rather than from investment to growth.

5. Sources of Economic Growth: The Latin American Experience

In this section we use the regression results just reported to compare Latin American growth performance with that of other countries, and discuss the sources of these differences as well as the growth prospect for the region.

5.1 Economic Growth of the Latin American Countries in Comparative Perspective

The cross-country regression results allow us to analyze growth performance of the Latin American countries relative to performance in other regions. We compare the growth performance of the Latin America to the best performance of East/Southeast Asia. Average per capita growth rates for the eight economies in the East/Southeast Asia region[17] were 5.6%, 4.5% and 5.1% over each decade of the 1965-95 period, while those for the 21 Latin American countries were 2.5%, -0.4% and 0.5% respectively.

We use the estimates of the parameters in the regression (3) of Table 6 for a simple "growth accounting" that breaks down the fitted values of growth rates for each country into the contributions from each of the explanatory variables. We then explore the differences in the fitted values of per capita income growth rates between East Asia and Latin America.

Table 7 presents the results. The basic regression can account for substantial part of the growth differences between two regions. For the 21 Latin American countries, the predicted growth rate is lower on average by 3.6 percentage point than that of East/Southeast Asia over the whole period from 1965 to 1995. This predicted difference can be broken down separately into the contributions from the ten explanatory variables.

The relatively higher income level of Latin America, compared to that of Asia in 1965 led to a lower growth in this region in the 1965-75 period because of the convergence effect. However, this convergence effect became rather favorable to Latin America in 1985 when the income of East Asia exceeded that of Latin America. Hence, the net convergence effect becomes negligible over the three decades from 1965 to 1995.

[17] The eight economies in our sample from East/Southeast Asia include Hong Kong SAR, Korea, Singapore, Taiwan, Thailand, Malaysia, Indonesia, and the Philippines.

Latin America had relatively poorer human resources- in terms of lower educational attainment and lower life expectancy than Asia. The net effect of human resources contributed to slower growth in Latin America by about 0.4 percentage point relative to Asia. The investment rate had rather small effect on Latin America's performance relative to Asia by lowering the per capita growth rate by about 0.2 percentage point per year. The contribution from the relatively unfavorable terms-of-trade shock was also small, explaining the growth differential only by 0.1 percentage point over the whole period.

By contrast, the institution and policy variables turned out to have a more significant effect on differences in growth rates. The combined effect of the differences in the five policy variables- government consumption spending, rule of law, inflation, democracy, and trade openness- accounted for 2.7 percentage points slower growth of Latin America relative to Asia over the period from 1965 to 1995. The contribution of the institution and policy variables to the difference in growth rates was 1.6 percentage points in the 1965-75 period but it increased to 3.2 and 3.4 percentage points in the later two decades- 1975-85 and 1985-95. Among the institution and policy variables, inflation and trade openness were two most important variables. The 2.7% difference is very large in a period of 30 years since it would generate a gap of income of 120%. That is, institutional and policy variables made Asia to exceed Latin American income by 120%. The higher inflation in Latin America reduced growth rate by 0.7 percentage points relative to Asia over the whole period from 1965 to 1995. The negative effect of high inflation was more significant in the 1985-95 period, lowering growth rate by 1.3 percentage points in Latin America relative to Asia. Latin America's relatively inward-oriented trade strategy accounted for slower growth of about 0.9 percentage points per year in Latin America. The other three institutional variables - government consumption, rule of law, and political freedom- contributed to the lower growth rate of Latin America by 0.4, 0.4 and 0.3 percentage points per year respectively over the three decades.

Thus, while the initial income and external conditions explain only moderate differences in growth rates, the major differences come from human resources and the institution and policy variables. In particular, the relatively poor economic policies, such as trade protection, high inflation, high government consumption, and lack of good institutions have been the most important factors that contributed to the relative slow growth of the Latin American countries during the last three decades.

5.2 The Determinants of Economic Growth within Latin America

The latest section focuses on relative performance of the Latin American countries as a whole respective to East Asia. But, there were also tremendous variations in growth performance among Latin American countries. While the best performing Brazil grew by 2.8 percent per year during the period from 1965 to 1995, the worst performer Nicaragua grew by -2.1 percent per year during the same period. In addition, growth rates fluctuated a lot over the period within a country. For instance, average per capita growth rates for Chile was only 0.9 percent over the period 1965-75 but increased to 1.5 percent over the period 1975-85 and more dramatically to 5.0 percent over the period 1985-95.

This subsection investigates how much of the variations in growth performance within Latin America can be attributed to the factors that explain the international growth variations. In particular, we are interested in knowing how much of the variations are due to differences in domestic institutions and policies.

The evidence suggests that the policy and institutional factors- such as trade openness, government consumption, inflation, rule of law, and political freedom- as well as human resources play an important role in economic growth within Latin America. Table 8 presents panel growth regressions for the same three sub-periods as before but limited to a Latin American sample of countries. We find that the same fundamental factors, such as human resources, terms of trade shock, and institution and economic policies, and a conditional convergence factor, which explain the bulk of the cross-national growth variations in the world also determine the growth variations within Latin America. In this Latin American sample, the impact of schooling in growth is a bit larger than one from the broader cross-country sample. Investment is insignificant in this Latin American sample as it was in the broader sample. It is important to emphasize that the regressions results for the 83 countries sample are similar to those of Latin America, which indicates that Latin America is well represented by the regressions for the large sample.

Based on the regression result of column 2 of Table 8, we can assess how much of the variations in growth performance within Latin America can be attributed to each explanatory variable. Table 9 shows the decomposition of the predicted difference in per capita growth rates across Latin American countries over the whole period from 1965 to 1995 among the explanatory variables. For instance, the predicted growth rate for Chile is higher on average by 1.4 percentage points than the average of the Latin America region. The relatively higher income level of Chile, compared to other Latin America countries led to about 0.6 percentage points lower growth in Chile for the last three decades because of the convergence effect. However, this negative effect on growth from high initial income was offset by the positive effects from good human resources. Human resources, schooling and life expectancy together, contributed to a higher growth of Chile by 1.3 percentage points. Moreover, better institutions and economic policies contributed further to a higher growth in Chile. The combined effect of the differences in the five policy variables- government consumption spending, rule of law, inflation, democracy, and trade openness- accounted for 1.0 percentage points faster growth of Chile relative to other Latin American countries over the period from 1965 to 1995. The strong effect of institutions and policies on growth are also visible in Mexico where the negative convergence effect from relatively higher initial income was completely offset by the positive effects from better institutions and policies. However, it is necessary to bear in mind that growth in all Latin American countries was very modest compared to the rest of the world.

By contrast, in some countries such as Guyana, Haiti, Honduras and Nicaragua poor institutions and economic policies acted against their favorable condition from lower initial income, leading to a far slower average per capita growth relative to other Latin American countries over the period from 1965 to 1995. For example, Haiti would have grown by 2.9 percentage points higher than the Latin America as a whole thanks to her

relatively lower initial income level. But, it turned out that the average growth rate of Haiti over three decades were about 2.8 percentage points lower than the regional average because of her poor human resources and economic institutions.

5.3 Growth Prospects

The results from cross-country regressions can be used to construct forecasts of economic growth for individual countries. We use the regression result of column (3) in Table 6 to project growth rates of real income per capita for 21 Latin American countries for the period from 1995 to 2005. The projected growth rates for 1995-2005 are obtained by multiplying 1995 values (or the closest year possible) values of explanatory variables by the estimated coefficients in the panel regression of column (3) in Table 6. The values for the terms of trade is assumed to remain the same as in the period of 1985-1995.

The projection results are presented in Table 10. The actual growth rates from 1985 to 1995 are also shown in the table. We find the Latin America as a whole region is forecasted to grow much faster during 1995-2005. Our rough projections suggest that per capita income growth in Latin America will be about 2.5 percent per year on average, rising from the 0.5 percent recorded in the 1985-95 period. This projected increase of growth rates of Latin America reflects higher levels of human resources and improvements of policies, including reduced inflation and improved rule of law, (relative to the earlier period).

In this projection, the average per capita growth rate for 81 countries with the necessary data for 1985-95 is 1.5 percent per year. Regional averages are 3.4 percent for 8 East Asian countries, -0.2 percent for 17 Sub-Saharan African countries, and 1.7 percent for 22 OECD countries. The projected slowdown of growth in east Asia and OECD are largely attributed to the convergence effect from their higher initial income in 1995 relative to the previous period. Hence, for the period 1995-2005 the average growth of Latin America will surpass the world and the OECD average growth rates, and become much closer to, though still below, the average growth rate of east Asia.

Among the 21 Latin American countries, Paraguay is the fastest-growing country by 5.0 percent per year during the period from 1995 to 2005, and followed by Honduras (4.0 percent), Dominican Republic (3.7 percent), Guatemala (3.7 percent), Chile (3.6 percent), and Jamaica (3.6 percent). In these countries relatively good human resources and policy conditions contribute positively to the growth, but also an important catching up effect stemming from their level of income below Latin American average, except for Chile. In contrast, for Brazil and Trinidad and Tobago the forecasted per capita growth rates are almost zero. The slow growth of Brazil is to a large extent due to the high levels of inflation it had until 1995. Of course, after the success on inflation after the real plan was introduced growth prospects should improve significantly.

These projections assume that every country will maintain its policy stance in 1995 until 2005. With additional policy reform, however, the Latin American countries can achieve much higher growth. Although Latin American countries are projected to grow much

faster in the next decade at 2.5 percent than the 0.5 percent growth rate they achieved between 1985-1995, they still lag the faster growing east Asian countries and the gap of per capita income will become wider. For a long period fiscal mismanagement, inward-looking industrial policy, and lack of good institutions retarded economic growth in many Latin American countries. The better human resources and improved institutions and policies are expected to provide a boost to growth in almost all Latin American countries in the next decade. But, future growth is subject to the continuation of current policy reform and maintenance of macroeconomic stability. For the countries, which do not maintain its current policy stance and institutional quality, future growth will be slower than the projections suggest. If they adopt better institutions and economic policies, on the contrary, they will have much brighter growth prospects.

6. Conclusions

This paper has examined the growth experience of Latin America and discussed prospects for the future. For this purpose we use alternative approaches - growth accounting and growth regression- to analyze the Latin America's growth performance. Our analysis is based on the extended version of the Solow growth model. Given this theoretical framework, as described in section 2, it is possible to combine estimates of the state of productivity across countries and its rate of growth to calibrate the steady state growth path and perform growth forecast. Using the evidence of cross-country regressions as those presented in section 4, it is also possible to estimate growth prospects for individual country and region.

The growth decomposition shows that the TFP growth was impressively large in the postwar period among OECD countries. Many OECD countries were able to sustain TFP growth above 3% per year for the forty years. Therefore, although rare, history shows it is not impossible to achieve fast long-run growth based on high productivity growth. This experience took place among developed countries after the devastating effects of the Second World War. It is plausible that as coming out of the debt crisis and years of macroeconomic mismanagement, Latin American countries have the strong potential of high productivity growth. High growth must rely on high productivity growth.

The cross-country growth regressions show that the relatively poor economic policies such as high inflation and inward looking development strategy were the main reason for the slow growth of Latin American countries vis-à-vis the rest of the world. But, as reforms have advanced within the region, growth prospects have improved substantially.

It is important to note that the "new approach to the sources of growth," based on the cross-country regressions on growth determinants still leaves an unexplained residual, which is in many cases substantial. The forecast we produce in section 4, assume that the residual is zero. Hence, although the projections presented in table 10 represent the expected average, it is still possible that countries could grow faster or slower due to the unexplained large residuals. As emphasized by the large evidence collected on the

determinants of growth, we have learnt that there are many other factors that can foster growth.

There are some similarities in the decomposition of growth using growth regressions and growth accounting. An important conclusion of growth accounting is that in most cases, what explains the differences in growth performance across countries and over time are changes in TFP growth. In turn, cross-country growth regressions allow us to pin down some of the underlying factors explaining the changes in productivity performance and growth. In the growth accounting we are forced to decompose per capita growth into either TFP growth or capital accumulation. With growth regressions we attempt to uncover the fundamental forces behind this.

In the neoclassical growth model what causes economies to grow is the rate of productivity growth and the catching up process through which reproducible capital stock moves toward its long run level. Therefore, both differences in productivity growth and the gap with the long run contribute to growth. Between two countries starting with the same initial conditions and productivity growth, the one with higher long run level of income will grow faster. One determinant of the long-run level of income is the saving rate, and through this channel it is possible to explain why investment may have a separate effect than those of other factors. But, the saving rate is also an endogenous outcome, rather than something exogenous in the catching up process. This is what the regressions highlight. What is needed to have a higher level of growth is to have institutions and policies conducive to growth. In this sense to rely on high investment to promote growth, or to explain high growth as just an important investment effort, as argued for East Asian economies, may be misleading. The empirical evidence on growth determinants shows that once we control for the other that foster long-term growth, investment becomes less significant. The policy and institution factors contribute to long-term growth by stimulating TFP growth as well as capital accumulation.

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Table 1: Economic Growth in Latin America

	GDP per capita		Average Annual per capita GDP Growth				
	1960	**1995**	**60 - 70**	**70 - 80**	**80 - 90**	**90 - 95**	**60 - 95**
Argentina	4462	5648	2.4	1.4	-3.2	3.7	0.7
Bolivia	1148	1779	3.8	1.8	-1.8	1.4	1.3
Brazil	1784	4249	3.2	5.9	-0.6	1.0	2.5
Colombia	1684	3762	2.4	3.2	1.1	2.7	2.3
Costa Rica	2096	3938	3.3	2.5	-0.6	2.4	1.8
Chile	2885	5648	2.3	0.8	1.1	5.4	1.9
Dominican Republic	1195	2412	2.5	4.3	-0.8	2.2	2.0
Ecuador	1461	2927	2.0	6.1	-1.6	1.2	2.0
El Salvador	1427	2165	2.4	1.1	-1.0	3.5	1.2
Guatemala	1660	2270	2.0	2.4	-1.9	1.3	0.9
Guyana	1596	1503	1.3	0.6	-5.5	6.6	-0.2
Haiti	924	526	-1.0	2.2	-2.3	-8.5	-1.6
Honduras	1039	1413	1.8	2.1	-1.0	0.5	0.9
Jamaica	1773	2556	4.1	-1.1	0.7	0.1	1.1
Mexico	2836	5698	3.5	4.3	-0.4	-0.4	2.0
Nicaragua	1606	1190	3.9	-2.4	-3.5	-1.7	-0.9
Paraguay	1177	2178	1.7	6.2	-1.7	0.5	1.8
Peru	2019	2672	3.1	0.5	-2.7	4.1	0.8
Trinidad & Tobago	5627	7853	1.9	5.2	-3.5	0.0	1.0
Uruguay	3968	5288	0.4	2.1	-1.0	2.8	0.8
Venezuela	6338	6335	2.0	-0.5	-2.0	0.9	0.0
Latin America (21)	2319	3429	2.3	2.3	-1.5	1.4	1.1
Sub-Saharan Africa (17)	784	1061	2.1	1.1	-0.8	-1.9	0.5
East Asia (8)	1275	8119	4.7	6.0	4.6	4.1	5.0
OECD (22)	5592	13364	4.3	2.5	2.1	1.1	2.7
World (81)	2667	6141	3.2	2.6	0.6	1.1	2.0

Source: Penn World Tables and World Bank.

Table 2: Growth decompositions across regions

	Growth of TFP	Contribution of Capital	Contribution of Labor	*Total GDP Growth*	Growth of TFP	Contribution of Capital	Contribution of Labor	*Total GDP Growth*
	period: 1960-73				period: 1974-86			
Latin America	1.1	2.8	0.2	*5.0*	-1.4	2.5	1.3	*2.4*
Africa	0.5	2.3	1.3	*4.1*	-1.0	1.7	1.4	*2.2*
East Asia	0.6	4.9	1.4	*6.8*	0.0	4.5	1.3	*5.9*
South Asia	0.2	2.7	0.9	*3.7*	1.3	3.1	1.1	*5.5*
Industrial	0.7	4.1	0.2	*5.1*	-0.2	2.3	0.3	*2.5*
World	0.7	3.3	0.9	*5.0*	-0.6	2.8	1.0	*3.2*
	period: 1987-94				**period: 1960-94**			
Latin America	0.0	1.3	1.2	*2.5*	**0.0**	**2.3**	**1.2**	***3.4***
Africa	-0.6	1.0	1.5	*1.9*	**-0.3**	**1.8**	**1.3**	***2.8***
East Asia	2.1	3.9	1.0	*7.0*	**0.7**	**4.5**	**1.3**	***6.5***
South Asia	1.0	2.8	1.0	*4.7*	**0.8**	**2.8**	**1.0**	***4.7***
Industrial	0.2	1.8	0.2	*2.2*	**0.3**	**2.9**	**0.3**	***3.4***
World	0.1	1.8	1.0	*2.9*	**0.1**	**2.8**	**1.0**	***3.8***

Source: Senhadji (1999)

Table 3: TFP growth in selected countries

Country	TFP growth	Period	Source
Argentina	0.5	1940-90	Elias (1990)
Brazil	0.8	1940-90	Elias (1990)
Chile	1.4	1940-90	Elias (1990)
Colombia	0.8	1940-90	Elias (1990)
Mexico	1.1	1940-90	Elias (1990)
Peru	-0.6	1940-90	Elias (1990)
Venezuela	0.1	1940-90	Elias (1990)
Hong-Kong	2.5	1966-90	Young (1995)
Indonesia	1.2	1966-90	Young (1995)
Korea	1.5	1960-94	Collins and Bosworth (1996)
Malaysia	1.1	1966-90	Young (1995)
Philippines	-0.4	1960-94	Collins and Bosworth (1996)
Singapore	1.5	1960-94	Collins and Bosworth (1996)
Taiwan	2.0	1960-94	Collins and Bosworth (1996)
Thailand	1.8	1960-94	Collins and Bosworth (1996)
Canada	1.8	1947-73	Christensen et al (1980)
France	3.1	1950-73	Maddison (1996)
Germany	3.3	1950-73	Maddison (1996)
Italy	3.4	1947-73	Christensen et al (1980)
Japan	3.6	1950-73	Maddison (1996)
Netherlands	2.5	1947-73	Christensen et al (1980)
United Kingdom	1.2	1950-73	Maddison (1996)
United States	1.4	1947-73	Christensen et al (1980)
Canada	0.7	1960-89	Dougherty and Jorgenson (1997)
France	1.8	1960-89	Dougherty and Jorgenson (1997)
Germany	1.7	1960-89	Dougherty and Jorgenson (1997)
Italy	2.1	1960-89	Dougherty and Jorgenson (1997)
Japan	3.2	1960-89	Dougherty and Jorgenson (1997)
United Kingdom	1.2	1960-89	Dougherty and Jorgenson (1997)
United States	0.5	1960-89	Dougherty and Jorgenson (1997)

Source: Data compiled by Barro (1998) and Crafts (1998).

Table 4: Decomposition of Output Growth

	60's	70's	80's	1960-90	60's	70's	80's	1960-90
Country	**Annual GDP Growth**				**Contribution of TFP Growth**			
Argentina	3.5	3.2	-1.7	1.6	0.7	0.6	-2.6	-0.5
Bolivia	6.7	4.5	0.7	3.9	3.6	0.8	-0.6	1.2
Brazil	5.9	8.4	1.5	5.3	1.5	2.5	-1.4	0.8
Colombia	5.5	5.5	3.2	4.7	2.3	2.0	-0.2	1.3
Costa Rica	6.9	5.4	2.2	4.8	2.3	-0.4	-1.1	0.2
Chile	4.2	2.7	3.1	3.3	1.6	0.5	0.6	0.9
Dominican Republic	6.7	7.1	1.5	5.1	3.3	0.9	-2.8	0.4
Ecuador	5.3	9.4	1.0	5.2	2.0	4.9	-2.1	1.6
El Salvador	6.4	3.6	0.4	3.3	1.6	-0.8	-1.2	-0.2
Guatemala	5.2	5.3	1.0	3.8	1.4	1.5	-1.7	0.3
Guyana	3.7	2.6	-4.2	0.6	1.1	-0.3	-5.0	-1.5
Haiti	1.1	4.0	-0.4	1.6	0.1	0.8	-3.3	-0.8
Honduras	5.2	5.6	2.4	4.4	1.5	1.3	-1.4	0.4
Jamaica	6.1	0.4	1.8	2.6	3.7	-2.5	0.4	0.5
Mexico	7.2	6.8	1.8	5.2	2.3	1.2	-1.8	0.5
Nicaragua	6.6	1.5	-0.7	2.3	1.9	-2.5	-3.7	-1.5
Paraguay	4.2	9.5	1.5	5.1	0.8	3.6	-3.8	0.2
Peru	5.8	3.3	-0.1	2.9	2.6	-0.3	-2.8	-0.2
Trinidad & Tobago	3.4	6.4	-1.9	2.6	0.3	2.0	-5.1	-1.0
Uruguay	1.7	2.6	-0.2	1.3	1.1	1.6	-0.9	0.6
Venezuela	6.1	3.0	0.7	3.2	3.2	-2.4	-2.0	-0.5
Average	5.1	4.8	0.6	3.5	1.9	0.7	-2.0	0.1
Std. Dev.	1.7	2.5	1.8	1.4	1.0	1.9	1.6	0.9
Country	**Contribution of Capital Accumulation**				**Contribution of Labor Growth**			
Argentina	2.0	2.0	0.3	1.4	0.8	0.6	0.6	0.7
Bolivia	2.0	2.4	-0.2	1.4	1.1	1.3	1.5	1.3
Brazil	2.5	3.8	1.7	2.7	1.8	2.1	1.3	1.7
Colombia	1.6	2.0	1.8	1.8	1.7	1.5	1.5	1.6
Costa Rica	2.7	3.5	1.6	2.6	1.9	2.4	1.8	2.0
Chile	1.7	0.8	1.0	1.1	0.9	1.5	1.5	1.3
Dominican Republic	2.2	4.4	2.3	3.0	1.3	1.8	2.0	1.7
Ecuador	1.9	2.8	1.5	2.1	1.4	1.6	1.7	1.6
El Salvador	2.7	3.0	0.7	2.1	2.1	1.4	0.8	1.4
Guatemala	2.2	2.6	0.9	1.9	1.6	1.3	1.8	1.6
Guyana	1.4	1.1	-0.1	0.8	1.3	1.8	0.8	1.3
Haiti	0.5	3.0	2.0	1.9	0.5	0.1	0.8	0.5
Honduras	2.2	2.4	1.4	2.0	1.5	1.9	2.4	1.9
Jamaica	2.0	1.2	0.0	1.0	0.4	1.6	1.4	1.2
Mexico	3.2	3.4	1.9	2.8	1.6	2.2	1.6	1.8
Nicaragua	3.4	2.2	1.0	2.2	1.3	1.8	1.9	1.7
Paraguay	2.0	4.0	3.4	3.2	1.4	1.9	1.9	1.8
Peru	2.0	1.6	1.1	1.6	1.2	2.0	1.5	1.6
Trinidad & Tobago	1.9	3.2	1.9	2.4	1.2	1.2	1.3	1.2
Uruguay	0.1	0.9	0.4	0.5	0.4	0.1	0.3	0.3
Venezuela	1.0	2.6	0.8	1.5	1.9	2.9	1.9	2.2
Average	2.0	2.5	1.2	1.9	1.3	1.6	1.4	1.4
Std. Dev.	0.8	1.0	0.9	0.7	0.5	0.7	0.5	0.5

Source: Author's calculations, assuming the share of labor of 0.6.

Table 5: Productivity growth in Argentina and Chile
(Average per year)

	Productivity Growth Facts				
	1980-97	80's	90's	Low growth	High growth
Argentina	0.0	-2.8	4.2	-2.8	4.2
Chile	1.4	0.0	3.6	-2.0	3.4

	Growth Decompositions 1990-97				
	GDP	Contribution of		TFP	Investment
	growth	Labor	Capital	growth	rate
Argentina	6.1	1.3	0.6	4.2	20.5
		[1.8]	[1.9]		
Chile	8.3	1.5	3.2	3.6	27.6
		[2.5]	[8.1]		

Note: Figures in square brackets are the rates of growth of factors.

Table 6. Cross-country Panel Regressions for Per Capita Growth Rate

Independent variable	(1)	(2)	(3)	(4)
Estimation method	*Seemingly-Unrelated Regression*		*Three-stage Least Squares Regression*	
Initial Income				
Initial GDP per capita(log)	-0.021	-0.020	-0.020	-0.019
	(0.003)	(0.003)	(0.003)	(0.003)
Human Resources				
Years of schooling	0.005	0.004	0.004	0.003
	(0.002)	(0.002)	(0.002)	(0.002)
Life expectancy(log)	0.047	0.041	0.052	0.045
	(0.012)	(0.012)	(0.014)	(0.014)
Investment Rate				
Investment rate	0.065	0.057	0.028	0.015
	(0.020)	(0.020)	(0.026)	(0.026)
Exogenous Shock				
Terms of trade change	0.136	0.133	0.140	0.125
	(0.030)	(0.030)	(0.033)	(0.031)
Institutions and Policy				
Government consumption	-0.113	-0.092	-0.109	-0.092
	(0.022)	(0.021)	(0.028)	(0.028)
Rule of law index	0.017	0.019	0.017	0.018
	(0.006)	(0.006)	(0.006)	(0.007)
Inflation rate (log)	-0.006	-0.005	-0.007	-0.008
	(0.001)	(0.001)	(0.002)	(0.002)
Democracy index	0.064	0.063	0.128	0.149
	(0.020)	(0.018)	(0.027)	(0.030)
Democracy index (squared)	-0.064	-0.064	-0.115	-0.134
	(0.016)	(0.016)	(0.023)	(0.026)
Openness index	0.009	0.007	0.014	0.012
	(0.003)	(0.003)	(0.005)	(0.005)
Regional Dummy				
Latin America dummy		-0.005		-0.008
		(0.003)		(0.004)
Sub-Saharan Africa dummy		-0.012		-0.012
		(0.004)		(0.005)
East Asia dummy		0.005		0.001
		(0.004)		(0.005)
Adjusted R^2	.60, .52, .42	.61 .52, .49	.52, .47, .49	.53, .44, .52
Number of observations	79, 83, 81	79, 83, 81	76, 83, 81	76, 83, 81

Notes: The system has three equations, where the dependent variables are the growth rate of real per capita GDP for each of the three periods 1965-75, 1975-85, and 1985-95. The estimations for columns 1 and 2 use the SUR (seemingly-unrelated) estimation technique, which allows the error term to be correlated across the three periods and to have a different variance in each period. Each equation is allowed to have a different constant term (not reported). Columns 3 and 4 use the three-stage least squares technique (with different instrumental variables used for each equation). Instruments include the five-year earlier value of log (GDP), the actual values of the initial schooling and life expectancy variables, and actual value of terms-of-trade variables, lagged values of the other variables aside from inflation, and dummy variables for prior colonial status (which were used as instruments for inflation). Standard errors are shown in parentheses. The R^2values and the number of observations apply to each period separately.

Table 7. Contributions to Growth Differentials Between Latin America and East/Southeast Asia Regions, 1965-95 (percent, annual average)

	Contributions to the difference in per capita growth of Latin America relative to East/Southeast Asia			
	1965-75	1975-85	1985-95	1965-95
Difference in				
Actual Growth	-3.2	-4.9	-4.6	-4.2
Predicted Growth	-2.9	-4.2	-3.7	-3.6 (100)
Initial Income	-0.9	-0.3	0.7	-0.1 (4)
Human Resources	-0.3	-0.4	-0.6	-0.4 (12)
Schooling	-0.2	-0.3	-0.4	-0.3 (8)
Life Expectancy	-0.1	-0.1	-0.2	-0.1 (4)
Investment rate	-0.1	-0.2	-0.3	-0.2 (6)
Terms of trade	0.0	-0.1	-0.1	-0.1 (2)
Institutions and Policy	-1.6	-3.2	-3.4	-2.7 (76)
Government Consumption	-0.3	-0.5	-0.5	-0.4 (12)
Rule of Law	-0.4	-0.4	-0.3	-0.4 (11)
Inflation Rate	0.0	-0.8	-1.3	-0.7 (19)
Democracy	0.1	-0.5	-0.5	-0.3 (9)
Openness	-0.8	-1.1	-0.8	-0.9 (25)

Table 8. Panel Regressions for Per Capita Growth Rate
in a Sample of 21 Latin American Countries

Independent variable	(1)	(2)
Estimation method	*Seemingly-Unrelated Regression*	*Three-stage Least Squares Regression*
Initial Income		
Initial GDP per capita(log)	-0.033	-0.027
	(0.006)	(0.006)
Human Resources		
Years of schooling	0.015	0.015
	(0.005)	(0.006)
Life expectancy(log)	0.069	0.062
	(0.022)	(0.022)
Investment Rate		
Investment rate	-0.032	-0.037
	(0.044)	(0.047)
Exogenous Shock		
Terms of trade change	0.170	0.128
	(0.047)	(0.054)
Institutions and Policy		
Government consumption	-0.216	-0.134
	(0.035)	(0.039)
Rule of law index	0.036	0.036
	(0.010)	(0.010)
Inflation rate (log)	-0.004	-0.006
	(0.002)	(0.003)
Democracy index	0.062	0.129
	(0.030)	(0.043)
Democracy index (squared)	-0.051	-0.103
	(0.026)	(0.036)
Openness index	0.017	0.016
	(0.006)	(0.008)
Adjusted R^2	.25, .75, .49	.41, .55, .61
Number of observations	21, 21, 21	21, 21, 21

Note: See Table 6.

Table 9. Contributions to Growth Differentials within Latin America, 1965-95 (percent, annual average)

	Difference in [1]		Contributing Factors									
Country	Actual growth	Predicted Growth	Initial income	Human Resource[2]	Investment	Terms of Trade	Institutions and policy variables					
							Total	Gov. cons.	Rule of law	Inflation	Democracy	Openness
Argentina	-0.5	-1.4	-2.0	1.0	0.0	-0.1	-0.2	0.8	0.0	-0.9	0.0	-0.2
Bolivia	0.1	0.5	1.2	-0.2	0.0	0.0	-0.5	-0.4	-0.8	-0.3	0.1	0.9
Brazil	1.9	0.1	-0.4	-0.1	-0.1	-0.1	0.8	0.3	1.0	-0.8	0.5	-0.2
Chile	1.0	1.4	-0.6	1.3	-0.2	-0.1	1.0	-0.3	1.4	-0.4	-0.4	0.7
Colombia	1.6	0.9	0.2	0.2	0.0	0.1	0.4	0.4	-0.4	0.0	0.3	0.1
Costa Rica	0.7	0.2	-0.4	0.8	-0.1	-0.1	-0.1	-0.6	1.0	0.2	-0.7	0.1
Dominican Rep.	1.3	1.4	1.1	-0.5	0.0	0.0	1.0	0.4	0.4	0.3	0.2	-0.3
Ecuador	1.2	2.2	0.3	0.2	-0.2	0.1	1.8	-0.1	1.0	0.0	0.2	0.7
El Salvador	-0.1	-0.7	0.9	-0.9	0.3	-0.1	-0.7	-0.8	-0.7	0.4	0.5	-0.1
Guatemala	-0.1	-0.3	0.6	-1.6	0.2	-0.1	0.6	0.5	-0.7	0.4	0.4	-0.1
Guyana	-1.0	-1.6	1.1	0.1	-0.3	0.0	-2.5	-2.1	-1.2	0.3	0.4	-0.1
Haiti	-2.6	-2.8	2.9	-2.1	0.4	-0.2	-3.7	-0.6	-1.2	0.4	-2.0	-0.3
Honduras	-0.1	0.2	1.9	-1.3	0.0	-0.1	-0.3	-0.1	-0.6	0.5	0.0	-0.3
Jamaica	-0.2	0.7	0.2	0.4	-0.2	0.0	0.2	0.4	-0.6	0.1	-0.1	0.3
Mexico	0.9	0.7	-1.5	0.3	0.0	0.0	2.0	0.6	0.8	-0.1	0.6	0.1
Nicaragua	-3.0	-1.9	0.5	-1.0	0.1	-0.1	-1.4	-0.3	-0.6	-0.3	0.0	-0.3
Paraguay	0.9	1.3	1.2	0.4	0.0	-0.1	-0.3	0.0	-0.5	0.3	0.1	-0.1
Peru	-0.6	-0.8	-0.2	-0.1	-0.1	-0.2	-0.3	0.3	-0.3	-0.5	0.3	-0.1
Trinidad & Tob.	-0.2	0.2	-3.0	1.1	0.1	0.4	1.6	0.8	1.0	0.4	-0.3	-0.3
Uruguay	0.3	0.1	-1.2	1.5	0.1	0.1	-0.4	0.1	0.4	-0.6	-0.1	-0.2
Venezuela	-1.4	-0.4	-2.7	0.6	-0.1	0.5	1.3	0.7	0.6	0.3	-0.2	-0.1

Notes: [1] Difference of each country's per capita growth rate from the average growth rate of Latin America for the period 1965-95. The actual unweighted average growth rate of Latin America for the period 1965-95 was 0.9 and the predicted rate was 0.8.

[2] Human resources include schooling and life expectancy variables.

Table 10. Growth Projects for Latin American Countries, 1995-2005

	GDP per capita		Projection		
			Per capita growth rate	Per capita growth rate	GDP per capita
Country	1985	1995	1985-1995	1995-2005	2005
Argentina	5324	5648	0.6	3.0	7585
Bolivia	1754	1779	0.1	2.5	2276
Brazil	4017	4249	0.6	0.0	4269
Chile	3467	5648	5.0	3.6	8063
Colombia	2968	3762	2.4	2.5	4839
Costa Rica	3184	3938	2.1	1.2	4421
Dominican Republic	2111	2412	1.3	3.7	3473
Ecuador	2913	2927	0.0	1.7	3480
El Salvador	1831	2165	1.7	2.5	2760
Guatemala	2090	2270	0.8	3.7	3260
Guyana	1265	1503	1.7	2.9	1999
Haiti	911	526	-5.3	2.0	644
Honduras	1387	1413	0.2	4.0	2084
Jamaica	2215	2556	1.4	3.6	3629
Mexico	5621	5698	0.1	2.5	7286
Nicaragua	1790	1190	-4.0	2.4	1512
Paraguay	2072	2178	0.5	5.0	3538
Peru	2565	2672	0.4	2.9	3552
Trinidad & Tobago	9701	7853	-2.1	0.1	7936
Uruguay	3969	5288	2.9	1.7	6254
Venezuela	6225	6335	0.2	1.5	7356
Region(no.of countries)					
Latin America (21)	3209	3429	0.5	2.5	4296
East Asia (8)	4835	7988	5.1	3.4	11151
Sub-Saharan Africa(17)	1148	1010	-1.3	-0.2	990
OECD (22)	11198	13586	2.0	1.7	16049
World (81)	5104	5701	1.1	1.5	6620

Notes: Per capita GDP levels and growth rates are based on 1985 international (purchasing power parity adjusted) prices, based on the Penn World Tables v.5.6. 1995 per capita GDP figures are extrapolated based on the latest real GDP value from the Penn World Table with the World Bank per capita real GDP growth rates. The projected growth rates for 1995-2005 are obtained by multiplying 1995 values (or the closest year possible) values of explanatory variables by the estimated coefficients in the panel regression of column (3) in Table 1.

Figure 1: Convergence

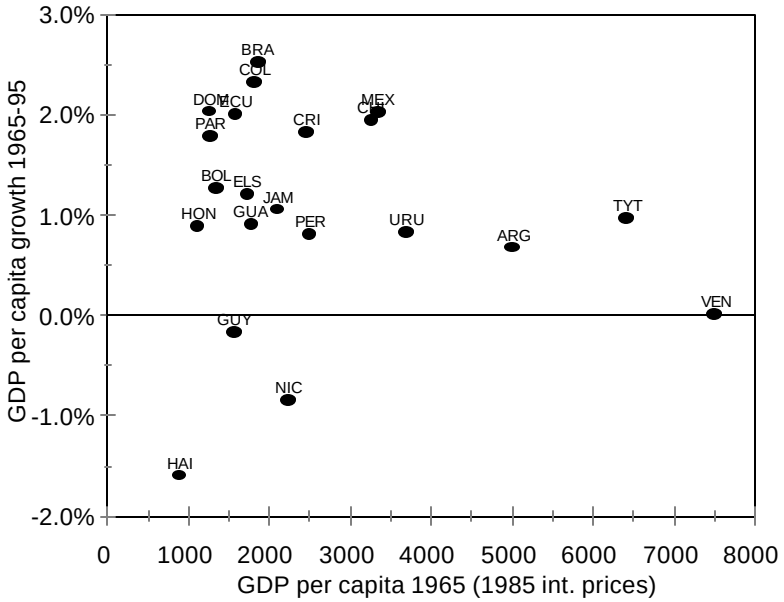

Figure 2: Investment and growth

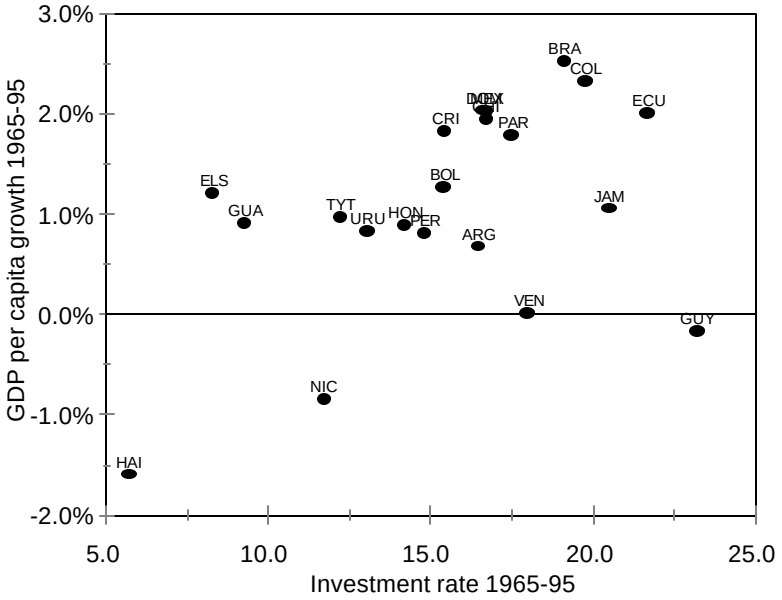

Figure 3: Population and GDP growth

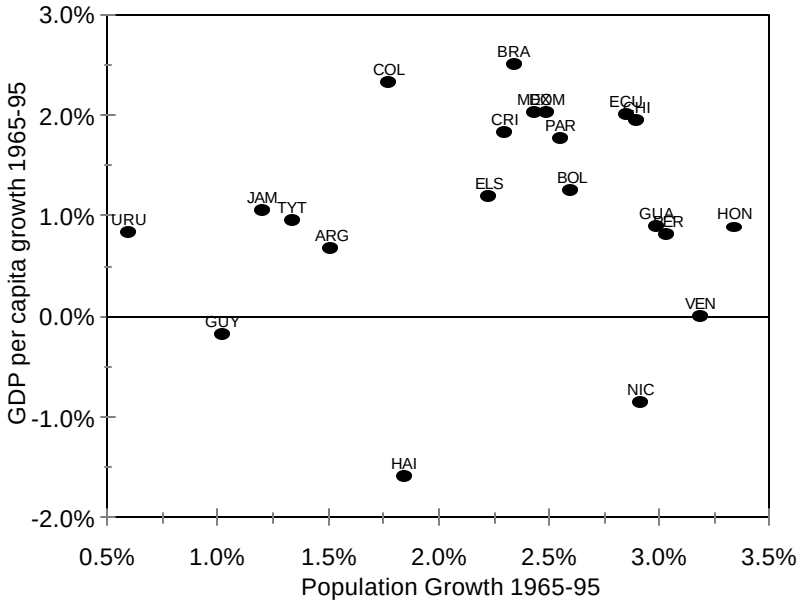

Figure 4: Total factor productivity (1980=100)